

Introduction and Methodology

Microchip Technology Incorporated's (Microchip) semiconductor devices are assembled at our assembly facility outside Bangkok, Thailand, and by subcontracted assembly sites throughout the world. Frequently, the qualified Bill of Materials (BOM) will vary among assembly sites for a given package configuration. The majority of variation lies in the mold compound and/or the internal die attach material used. The semiconductor device material data presented is calculated using a mass balance methodology for the primary qualified assembly site or the most commonly produced BOM.

RoHS Recast or "RoHS2:

Microchip semiconductor products or devices still fall under the same conditions they were under the old RoHS declarations. Piece parts are still not classified as EEE. Microchip's plastic semiconductor products are still approved for RoHS required designs without exemption. All Ceramic packaged products still contain Pb (lead) and are not recommended for RoHS required applications. FET/PDFN packages utilize EU exemption 7(a) - Pb (lead) in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead).

Ozone Depleting Materials

Microchip Technology Incorporated's semiconductor devices neither contain nor are manufactured with Class I or Class II Ozone Depleting Chemicals ("ODCs"). For purposes of this document "ODCs" are those substances listed in 40CFR82A App A, and 40CFR82A App B, July 1, 2008.

Brominated Flame Retardant Polymers

Beginning 1 July 2009, Microchip production locations were qualified as Halogen-Free as defined per IEC 61249-2-21:2003: Bromine (Br) \leq 900 and Chlorine (Cl) \leq 900 ppm by homogeneous material weight. With total Bromine (Br) plus Chlorine (Cl) content \leq 1,500 ppm by homogeneous material weight. Additionally, Antimony Trioxide (Sb2O3) is less than 1,000 ppm.

Prior to July 2009, Microchip's semiconductor devices may have contained Antimony Trioxide, [Sb2O3] (CAS # 1309-64-4) and one of two brominated (Br/B08) phenolic/epoxy polymers: CAS # 68541-56-0 or CAS # 40039-93-8 used in the flame retardant system of the molding compounds. Neither of these brominated phenolic/epoxy polymers are regulated by European Union's REACH Directive. Microchip's semiconductor devices do not contain pentaBDE or octaBDE, two brominated flame retardants regulated by European Union Directive 2003/11/EC (6 February 2003).

Many of the mold compounds used by Microchip or its sub-contract assembly houses contained one of two brominates phenolic/epoxy polymers: CAS # 68541-56-0 or CAS # 40039-93-8. Neither of these brominated phenolic/epoxy polymers are regulated by European Union Directive REACH Directive. Microchip's semiconductor devices **do not** contain pentaBDE or octaBDE, two

8/29/2013



brominated flame retardants regulated by European Union Directive 2003/11/EC (6 February 2003).

Substances of Concern

Microchip's semiconductor products may contain Nickel (Ni) in one or more of three applications:

- Nickel is one of the three plating materials used on the pins of the semiconductor, hence, the term Nickel (Ni) / Palladium (Pd) / Gold (Au) pin finish. The plating order is determined by the physical properties (adhesiveness) between each substance; Copper to Nickel to Palladium to Gold. Gold is the outer most substance, forming a shield around the Nickel and protecting against skin contact;
- Nickel is an alloying element in three lead frame alloys used by Microchip C194, C7025, and A42; and
- Nickel may be impurity in the matte tin plating.

Each occurrence is compliant with EU Directive 94/27/EC. Please consult the specific Material Content Declaration (MCD) for the estimated material content value.

The mold compounds used by Microchip and its sub-contract assembly houses to assemble Microchip's semiconductor devices **do not** contain inorganic particulate red phosphorous. Rather, prior to July 2009, diantimony trioxide was the primary inorganic flame retardant material in most mold compounds; one unique mold compound used a trade secret "metal hydroxide" instead of diantimony trioxide. Certain mold compounds **do not** contain an inorganic flame retardant.

Absence of Chemical Substances

If a chemical substance is absent from the spreadsheet reflecting its Bill of Materials at specific assembly site, its absence from the chemical substance list(s) means:

- The chemical substance is **NOT** an intentional ingredient in the semiconductor device; and
- To the best of Microchip's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, <u>if any</u>, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

Recyclate Information (IMDS Format)

Amount of contained recyclate – as released? 0%

Amount of contained recyclate – as measured? 0%

Amount of contained recyclate – post industrial recyclate? 0 g / 0%

Amount of contained recyclate – post consumer recyclate? 0 g / 0%

Joint Industry Guide No. JIG-101 Ed. 4.1

Microchip semiconductor products meet the requirements of the Consumer Electronics Association (CEA), DIGITALEUROPE, and Japanese Green

8/29/2013



Procurement Survey Standardization Initiative (JGPSSI) Joint Industry Guide - Material Composition Declaration for Electro technical Products - JIG-101 Ed. 4.0. This guide represents industry-wide consensus on the relevant materials and substances that shall be disclosed by suppliers when those materials and substances are present in products.

Implementation of copper wire bond

(PdCu) Palladium Copper Wire provides superior electrical performance over (Au) Gold Wire. Using PdCu wire provides a hedge on rising prices that can affect the supply of gold available for manufacturing. Therefore, PdCu wire helps ensure a steady supply of components that can support your ongoing business needs. It is Microchip's intent to convert all applicable products within the next 18 to 24 month. This switching of wire bond materials does not change the environmental compliance or reporting catogory of any product. To facilitate the ease of material content reporting to both our suppliers and customers during this transition, all transitioned Palladium Copper Wire packages the content is group together.

Microchip Technology Incorporated's General Statement of Warranty

Microchip accepts no duty to notify any user of updates or changes. Further, the exclusive, limited product warranties provided by Microchip Technology Inc. and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgements, and invoices. Microchip shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on this document. It is the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and any reasonable or foreseeable uses of the components or systems used or purchased.

8/29/2013

Basic Substance CAS Number Sub-Component Weight mg/part Fused Sitios 60676-66-0 Modi Compound 14.050 Fused Sitios 60676-66-0 Modi Compound 17.74 77.06-1 Modi Compound 17.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74 77.74	MICROCHIP Semiconductor Device:	Type: EB 03 (Lead) DDPA	NK (FA)		nation Base A pper Alloy (C	. ,		•	nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substantion Control State Control S		, ,	"Contained In"				544.12	(mg) Total	Mold Compound	% ot Total Weigh	1
Expox Resn 1 Triple Secret Model Compound 1274 17.884 127.53 Expox Resn 1 Triple Secret 3.05 Expox Resn 1 Triple Secret 3.								,	·		1
Expos Plant Plan											4
Principle Ream											
Carbon Black 133-36-4 Mold Compound 0.098 1.360 980 Undeclared Trade Secret Mold Compound 0.392 5.41 3.021 Undeclared Trade Secret Mold Compound 0.392 5.41 3.021 Undeclared Trade Secret Mold Compound 0.392 5.41 3.021 Undeclared Trade Secret Trade Secret											
Copper 1740-09-08 Least Frame											
Silver (Ag) 140-31-5 Lead Frame 0.099 1.368 986 828.87 (mol Total Lead Frame 9.73 1.000 1.37 1.000	Undeclared	Trade Secret	Mold Compound	0.392	5.441	3,921		Undeclared	Trade Secret	1.00	
Silver 7440-22-4 Lead Frame 1.38 15.790 11.379 1.1379	Copper	7440-50-8	Lead Frame	58.494	811.716	584,936			Total	100.00)
Silver (A) 7440;224 Lead Fiame 1,138 15,790 11,790 17,790	 Tin	7440-31-5	Lead Frame	0.099	1.368	986	828.87	(mg) Total	Lead Frame	% of Total Weigh	t 59.73
Proprietary (Fear and the Hardener Trade Secret Die Attach 0.0030 0.046 33 Foot 100 100 100 100 100 100 100 100 100 10	Silver	7440-22-4	Lead Frame	1.138	15.790	11.379					
Proprietary Curing agent & Hardener Silicon 7440-27-3 Chy (Die) 0.27 3.74 7.700 Gold 7440-57-5 Wire Bond 0.070 0.071 700 Tin 7440-57-5 Wire Bond 0.070 0.071 700 Tin 7440-57-5 Wire Bond 0.070 0.071 700 Total Mass 1.3877 g Total	Silver (Ag)	7440-22-4	Die Attach	0.086	1.198	864		Tin	7440-31-5	0.17	
Silloon 7440:51-3 Chip (Die) 0.270 0.37.47 2,700 1.53 (ma) Total Die Attach No. 17440:51-5 Wire Bond 1.400-51-5 Wi	Proprietary Resin	Trade Secret	Die Attach	0.020	0.282	204		Silver	7440-22-4	1.91	
Gold 7440-97-5 Write Bond 1 7440-97-5 Write B	Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.003	0.046	33			Total	100.00	<u> </u>
Tin 7440-31-5 Petrg on external leads gires) - Matter Tin / servested at 150°C fet 10x0 (0.00 to 1,387.70 to 1,000,000 to 1,387.70 to 1,387	Silicon	7440-21-3	Chip (Die)	0.270	3.747	2,700	1.53	(mg) Total	Die Attach	% of Total Weigh	t_ 0.11
1.3877 g Total Mass 1.3877 g	Gold		Wire Bond	0.070	0.971	700		Silver (Ag)	7440-22-4	79	
1.3877 g Total Mass 1.3878 g Total Mass 1.3878 g Total Mass 1.3878 g Total Mass 1.3878 g	Tin	7440-31-5 Plating									
No semiconductor device and its homogenous materials comply with EU Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). Silicon (Tytu (RoHS) (ELV) Directive) (And House 2002/39/EC (End-of-Life Vehicles (ELV			TOTALS:	100.000	1,387.700	1,000,000	Prop	rietary Curing agent & Har		-	
his semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 3.75 Total (mg) Chip (Die) % of Total Weight 0.27 Total (mg) Chip (Die) % of Total Weight 0.27 Total (mg) Chip (Die) % of Total Weight 0.27 Total (mg) Chip (Die) % of Total Weight 0.27 Total (mg) Chip (Die) % of Total Weight 0.27 Total (mg)		1.3877 g Tot	tal Mass						Total	100.00)
ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ he protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and retain "reels" may be made from PVC plastic. Gold 7440-57-5 100	f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do	emical substance is NOT an inter cument, there is no credible reas	ntional ingredient in the semiconductor device and					Silicon			
ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace evels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ilicrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product rarranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uctations, sales order acknowledgement, and invoices. Ilicrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or for the finite party test reports (SGS) or for the parties of Compliance for semiconductor products. Total 100.00			You can access the UL iQTM family of databases t	to obtain a test	report at		0.97	(mg) Total	Wire Bond	% of Total Weigh	t 0.07
licrochip Technology Incorporated believes the information in this form concerning substances restricted by ROHS in Microchip Technology Incorporated's semiconductor devices in heir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vertically and the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vertically and the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vertically and the average weight of these parts and the average weight of these parts and the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vertically and the average weight of these parts and the average weight of the information provided by subcontract assemblers and raw material suppliers. Suppliers. Information in function to the finished parts and raw material suppliers. Suppliers and raw material suppliers. Information information in function toxic metals components. These estimates do not include trace vertically and raw material suppliers. Information information in function provided in this declaration. The exclusive, limited product and in function information in function provided in function provided in functio	The protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic.	ed are made from polyvinyl chlo	oride (PVC) plastic. "Window envelopes" used to he	old the packing	slip on the ou	iter box and		Gold	7440-57-5	100	
licrochip Technology Incorporated dark in provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's defended and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's defended and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's defended in	heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it ha nformation is often protected from disclosure as trade secre s provided only as estimates of the average weight of these	t of its knowledge and belief, as as been compiled based on the r ts and some information may no parts and the average weight of	of the date listed in this form. Microchip Technologanges provided in Material Safety Data Sheets pro thave been provided by subcontract assemblers anticipated significant toxic metals components. T	gy Incorporate vided by raw n and raw mater	d cannot guara naterial supplic al suppliers. In	antee the ers. Supplier nformation			Total	100.00	Τ
therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or fit is Certificate of Compliance for semiconductor products.							8.46	(mg) Total	leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weigh	t 0.61
								_	7440-21-5	100.00	
			ion in Material Content Declarations (MCD) or inde	penaent tnira p	arty test repo	113 (303) 01					

EB 3L DDPAK 10:54 AM : 8/29/2013

Basic Substance CAS Number Sub-Component Weight gipant ppm Fund Silica (6007-86-0) Enoy Resin 1 Trade Secret Mold Compound (7008-0) Enoy Resin 1 Trade Secret Fund Silica (7008-0) Fund Silica Fund Sili	Semiconductor Device	Type: ET 05/1 each I	DDPAK (17)		nation Base A pper Alloy (C	-		•	ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Subset Substance Las Number Sub-Component Figs Storet		. , po. 21 00 (2000) 1		% Total		1		1	ı		
Etoxy Resin 1 Trade Secret Modi Compound 0.988 17/125 8.862 Expos Resin 1 Trade Secret Modi Compound 0.787 15.86 8.7882 Expos Resin 1 Trade Secret Modi Compound 0.088 17/125 8.8624 P. 100 P.	Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	526.92	(mg) Total	Mold Compound	% ot Total Weight	26.56
Enow Resin 2 Trade Secret Model Compound 1.156 23.712 11 1902. Changes Model Compound 1.03.85 5.260 2.058 1.058 2.058 1.058 2.058	Fused Silica	60676-86-0	Mold Compound	23.373	463,693	233.728		Fused Silica	60676-86-0	88.00	1
Phonographics Trade Secret Mode Compound 1.196 22.712 1.1962 Carbon Black 1333-864 Mode Compound 0.056 1.377 664 Carbon Black 1333-864 0.95 Carbon Black 1333-864 0.	Epoxy Resin 1							Epoxy Resin 1	Trade Secret	3.25	
Cathor Black Undicationed Trade Secret Modi Compound O.086 1317 0642 Undicationed Trade Secret Modi Compound O.086 1317 0642 Undicationed Trade Secret Modi Compound O.086 1317 0642 Undicationed Trade Secret Trade Secret O.096 7440-50-6 1.60 Frame O.119 2-301 1.190.7 1.401.711 702.771 From Popping Secret 1.00 1.402 1.707 1.402 1.707 1.402 1.707 1.401.707 1.402 1.707 1.700 1.402 1.707 1.700 1.402 1.707 1.700	Epoxy Resin 2	Trade Secret	Mold Compound	0.797	15.808	7,968		Epoxy Resin 2	Trade Secret	3.00	1
Undestined Trials Secret Mode Corporary 2740-0-0-8 Lead Frame 70.272 140/11 7062/71 1902/71 19	Phenol Resin	Trade Secret	Mold Compound	1.195	23.712	11,952		Phenol Resin	Trade Secret	4.50	
Copper 7449-50-8 Lead Frame 70-827 1491-171 706-271 1491-171 706-271 1491-171 706-271 1492-171 1492	Carbon Black	1333-86-4	Mold Compound	0.066	1.317	664		Carbon Black	1333-86-4	0.25	
Tin 1440-31-5 Lead Frame 0.119 2.361 1,190 148-77 mg Total Lead Frame 1.374 2.7257 153,739 Silver (A) 7440-22-4 Lead Frame 1.374 2.7257 153,739 Silver (A) 7440-22-4 De Allach 1.374 2.7257 153,739 Silver (A) 7440-21-5 De Allach 1.374 2.725 De Allach 1.374 2.7	Undeclared	Trade Secret	Mold Compound	0.266	5.269	2,656		Undeclared	Trade Secret	1.00	
Silver 1740-21-2-4 Lead Frame 1.194 2.381 1.190 1.436.79 (mg) Total Lead Frame 1.27-2 (72.75) 1.37-2 (72.75) 1.	Copper	7440-50-8	Lead Frame	70.627	1401,171	706.271			Total	100.00	u .
Silver (Ag) 1740-22-4 De Attach 0.071 1.374 27.37 13.789 Copper 7.40-99-8 97.93 1.780 Projection (Agency of the Comment of the	Tin	7440-31-5	Lead Frame	0.119	2.361	1,190	1430.79	(mg) Total	Lead Frame	% of Total Weight	72.12
Silver (Ag) 7440-22-4 Die Attach 0.017 1.402 707											
Proprietary Curring agent & Hardener Trade Secret Die Attach 0.003 0.054 27 Total 100.00 Proprietary Curring agent & Hardener Trade Secret Die Attach 0.003 0.054 27 Total 100.00 Proprietary Curring agent & Hardener Davis Curring Curring agent & Hardener Davis Curring Curring agent & Hardener Davis Curring Curring Davis Curring Curring Davis Curring Curring Davis Davis Curring Curring Davis Davis Curring Curring Davis Davis Curring Curring Davis Da											1
Proprietary Curring agent & Franciser Silicon 740-21-3 Chip (Dis) Gold 740-57-5 Perry on external less big transport of the Chip (Dis) For the Chi			Die Attach	0.017		167		Silver		1.91	
Silicon 7440-21-3 Chip (Dia) 0.620 12.300 6.200 1.79 (mol Total Dia Attach V. of Total Wight 0.99	Proprietary Curing agent & Hardener		Die Attach	0.003	0.054	27			Total	100 00	4
Gold T440-S7-5 Wire Bond Tin 7440-31-5 Plang on external basis (pray) - Matter Try arresised at 159°C for 1 hour D. 770 13.08 5,700 13.08							1 79	(mg) Total			
Tin 7440-31-5 Patery on external leads (pres) - Matter Tn / amesaled at 150°C for 1 now 1.983.90 1,000,000 1,983.90 1,000,000 1,983.90 1,000,000 1,983.90 1,000,000 1 1,983.90 1 1,983.90 1,000,000 1 1,983.90 1 1,983.90 1 1,983.90 1,983											1
1.9839 g Total Mass semiconductor device and its homogenous materials comply with EU Directive? 1.9839 g Total Mass semiconductor device and its homogenous materials comply with EU Directive? 1.9839 g Total Mass semiconductor device and its homogenous materials comply with EU Directive? 1.9839 g Total Mass semiconductor device and its homogenous materials comply with EU Directive? 1.9839 g Total Mass semiconductor device and its homogenous materials comply with EU Directive? 1.9839 g Total Mass semiconductor device and the semiconductor device and, to the best of Microchip Technology properties for the list above, the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance is above the threshold of regulatory concern for any regulatory scheme world-wide. In go compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL IQTM family of databases to obtain a test report at VIL.com/globale/gapages/offerings/industries/chemical/plastics). 1.079 (mg) Total Wire Bond Wi								ee. (g/			
1.9839 g Total Mass semiconductor devices and its homogenous materials comply with EU Directive 2002/59/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU tive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Doped Silicon Total 100.00	1111	7440 01 0					Droprioton				
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2002/95/EC (RoHS Directive) and with EU Directive) and with EU Directive 2002/95/EC (RoHS Directive) and provided in the semiconductor device and, to the best of Microchip Technology reported test when above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Doped Silicon 7440-21-3 100.00				100.000	1,963.900	1,000,000	Proprietary	Curing agent & Hardener		5	1
liance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Doped Silicon 7440-21-3 100				S Recast Dire	ctive) and with	EU					
hemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology porated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. In go compounds used by Microchip meet the U_94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at Mulcondiglobal/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and in "reels" may be made from PVC plastic. Total JGPSSI (D02) 7440-57-5 100 JGPSS							12.30	Total (mg)	Chip (Die)	% of Total Weight	0.62
is not below the threshold of regulatory concern for any regulatory scheme world-wide. Ifing compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at 0.79	, , , ,	ria internal design control:	s, supplier declarations, and /or analytical test data.		,		12.30	, ,	' ' '		0.62
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ain "reels" may be made from PVC plastic. Total JGPSSI (D02) 7440-57-5 100 JGPSSI (D02) JGPS	npliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che	emical substance is NOT	an intentional ingredient in the semiconductor device and	, to the best of	· Microchip Te	chnology	12.30	, ,	7440-21-3	100	
in "reels" may be made from PVC plastic. JGPSSI (DD2) 7440-57-5 100	pliance with the above EU Directives has been verified v themical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this do	emical substance is NOT a	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce	, to the best of	· Microchip Te	chnology	12.30	, ,	7440-21-3	100	
prociping packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the obleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information by ovided only as estimates of the average weight of these parts and the average weight of these parts and the average weight of interior mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of these parts and the average weight of interior maticipated significant toxic metals components. These estimates do not include trace so include trace as of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. The plating on external leads (pins) - Matte Tin / annealed at 150°C for solve the standard terms and conditions of sale. These are provided in Microchip's attentions, sales order acknowledgement, and invoices. The plating on external leads (pins) - Matte Tin / annealed at 150°C for solve the standard terms and conditions of sale. These are provided in Microchip's attentions, sales order acknowledgement, and invoices. The plating on external leads (pins) - Matte Tin / annealed at 150°C for solve the standard terms and conditions of sale. These are provided in Microchip's attentions, and the provided parts are contained with the party test reports (SGS	pliance with the above EU Directives has been verified v hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 fla	emical substance is NOT a cument, there is no credil regulatory scheme world mmability standard for pla	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concer- wide.	, to the best of ntration of the	Microchip Tec	chnology		Doped Silicon	7440-21-3 Total	100	
original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information ovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace sof dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product anties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's actions, sales order acknowledgement, and invoices. Ochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or is certificate of Compliance for semiconductor products.	pliance with the above EU Directives has been verified verthemical substance is absent from the list above, the che reporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 VO fla //ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp	emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for pla s/plastics/	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to	, to the best of ntration of the o obtain a test	Microchip Techemical subs	chnology tance, if		Doped Silicon (mg) Total	7440-21-3 Total	100 100.00 % of Total Weight	
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 11.31 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for working disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or revise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or Tin 7440-31-5 100.00	npliance with the above EU Directives has been verified vechemical substance is absent from the list above, the che provated's knowledge and belief as of the date of this doe, is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 fla://ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic.	emical substance is NOT cument, there is no credil regulatory scheme world immability standard for pl. s/plastics/ led are made from polyvir	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to be concelled the	, to the best of ntration of the o obtain a test old the packing	Microchip Techemical substreport at	chnology stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.04
rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line 100.00 is Certificate of Compliance for semiconductor products.	pliance with the above EU Directives has been verified verbemical substance is absent from the list above, the cherporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 flax/ful.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. oochip Technology Incorporated believes the information original packing materials is true and correct to the bespleteness and accuracy of data in this form because it humation is often protected from disclosure as trade secre ovided only as estimates of the average weight of these	emical substance is NOT cument, there is no credit regulatory scheme world immability standard for ples/plastics/ sed are made from polyvin in this form concerning set of its knowledge and be as been compiled based obtained some information parts and the average we	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to leave the leav	, to the best of ntration of the o obtain a test old the packing ncorporated's a gy Incorporate vided by raw n and raw materi	Microchip Techemical substreport at g slip on the outside a semiconductor d cannot guaraterial supplie.	chnology tance, if atter box and r devices in antee the ers. Supplier formation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.04
Ton 100 001	pliance with the above EU Directives has been verified verthemical substance is absent from the list above, the cherporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 V0 flat/ful.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information original packing materials is true and correct to the bespleteness and accuracy of data in this form because it himation is often protected from disclosure as trade secre ovided only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained onchip Technology Incorporated does not provide any waranties provided by Microchip Technology Incorporated a	emical substance is NOT cument, there is no credil regulatory scheme world immability standard for ples/plastics/ sed are made from polyvin in this form concerning stof its knowledge and be as been compiled based cets and some information parts and the average we within silicon devices (signanty, express or implied	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to be seen the second of the seco	, to the best of ntration of the o obtain a test old the packing neorporated's a y Incorporate vided by raw nand raw mater i'hese estimate	Microchip Techemical substreport at g slip on the outside deannot guaranterial supplied as do not includisive, limited p	chnology tance, if atter box and or devices in antee the ers. Supplier aformation de trace	0.79	Doped Silicon (mg) Total JGPSSI (D02)	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.04
	pliance with the above EU Directives has been verified verbemical substance is absent from the list above, the cherporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 V0 flat/ful.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information original packing materials is true and correct to the bespleteness and accuracy of data in this form because it himation is often protected from disclosure as trade secre ovided only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained ochip Technology Incorporated does not provide any wanties provided by Microchip Technology Incorporated attions, sales order acknowledgement, and invoices.	emical substance is NOT cument, there is no credil regulatory scheme world mmability standard for ples/plastics/ ped are made from polyvin in this form concerning set of its knowledge and be as been compiled based cets and some information parts and the average we within silicon devices (signanty, express or implied and its subsidiaries are contained to the substance on the interest of the substance	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to the concelling of the concel	, to the best of ntration of the o obtain a test old the packing accorporated's agy Incorporate vided by raw in and raw mater' hese estimate tion. The exclusiale. These are rect or indirect or indirect	Microchip Techemical substreport at g slip on the outsemiconductor d cannot guaraterial supplifies to do not include sive, limited p provided in Matter to consequential, to consequential substreption of the provided in Matter to consequential substreption of the provided in Matter to consequential substructions of the provided in Matt	chnology stance, if after box and r devices in antee the resultance of the formation de trace roduct ficrochip's	0.79	Doped Silicon (mg) Total JGPSSI (D02) (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.04

ET 5L DDPAK 10:54 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: MC 09 (total	DEN com (DA/DV)		ation Base A	-		•	ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device	Type. IVIC 00 (Lead	"Contained In"	% Total	ī	1			T		63
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	7.49	(mg) Total	Mold Compound	% ot Total Weight	48
Silica, fused	60676-86-0	Mold Compound	43.200	6.739	432,000		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.328	0.363	23,280	Epox	y Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.328	0.363	23,280		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.144	0.022	1,440		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	44.421	6.930	444,212			Total	100.00	Ţ
Tin	7440-31-5	Lead Frame	0.114	0.018	1,140	7.11	(mg) Total	Lead Frame	% of Total Weight	45.6
Silver	7440-22-4	Lead Frame	0.869	0.136	8,687		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.082	0.013	821		Tin	7440-31-5	0.25	1
Chromium	7440-47-3	Lead Frame	0.114	0.018	1,140		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.187	0.029	1,872		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.043	0.007	432		Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.005	0.001	48			Total	100.00	<u> </u>
Heterocyclic organic compound	Trade Secret	Die Attach	0.005	0.001	48	0.04	(mg) Total	Die Attach	% of Total Weight	0.24
Silicon	7440-21-3	Chip (Die)	1.640	0.256	16,400		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.400	0.062	4,000		Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.120	0.643	41,200		Treated silica	Trade Secret	2	
		TOTALS:	100.000	15.600	1,000,000	Heter	ocyclic organic compound	Trade Secret	2	
	0.0156	g Total Mass						Total	100.00	_
This semiconductor device and its homogenous materials of Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the chicorporated's knowledge and belief as of the date of this di	ria internal design control emical substance is NOT	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and	I, to the best of	Microchip Ted	chnology	0.26	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 flahttp://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is shipp	r regulatory scheme work nmmability standard for pl s/plastics/	d-wide.	to obtain a test	report at	·	0.06	(mg) Total	Wire Bond	% of Total Weight	0.4
certain "reels" may be made from PVC plastic.	,	,	pg				Gold	7440-57-5	100	
Microchip Technology Incorporated believes the information their original packing materials is true and correct to the best completeness and accuracy of data in this form because it I information is often protected from disclosure as trade secrits provided only as estimates of the average weight of these levels of dopants, metals, and non-metal materials contained	st of its knowledge and be as been compiled based ets and some information parts and the average we	lief, as of the date listed in this form. Microchip Technolo on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. T	gy Incorporated vided by raw m and raw materi	l cannot guara aterial supplical suppliers. Ir	antee the ers. Supplier nformation			Total	100.00	3
Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated quotations, sales order acknowledgement, and invoices.						0.64	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	4.12
Microchip disclaims any duty to notify users of updates or cotherwise, suffered by users or third parties as a result of the Contilions for a microchip and the contilions for a microchip and the contilions for a microchip	e users' reliance on the ir						Tin	7440-31-5	100.00	
of this Certificate of Compliance for semiconductor products	s.									

MC 8 DFN 10:54 AM : 8/29/2013

100.000

15.600

MICROCHIP Semiconductor Device	Types MF 00 a vi	DEN		nation Base A pper Alloy (C	. ,			ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device	Type: INF U8 (Lead) I	DFN 3x3 mm (A7 / AJ) "Contained In"	% Total						T	es
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	12.20	(mg) Total	Mold Compound	% ot Total Weight	51.24
Silica, fused	60676-86-0	Mold Compound	46.116	10.976	461,160		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.485	0.591	24,851	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.485	0.591	24,851]	Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.154	0.037	1,537		Carbon Black	1333-86-4	0.30	<u>]</u>
Copper	7440-50-8	Lead Frame	38.576	9.181	385,763			Total	100.00	
Tin	7440-31-5	Lead Frame	0.099	0.024	990	9.42	(mg) Total	Lead Frame	% of Total Weight	39.6
Silver	7440-22-4	Lead Frame	0.754	0.180	7,544		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.071	0.017	713		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.099	0.024	990		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.733	0.175	7,332		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.169	0.040	1,692		Chromium	7440-47-3	0.25	<u>]</u>
Treated silica	Trade Secret	Die Attach	0.019	0.004	188			Total		
Heterocyclic organic compound	Trade Secret	Die Attach	0.019	0.004	188	0.22	(mg) Total	Die Attach	% of Total Weight	0.94
Silicon	7440-21-3	Chip (Die)	3.610	0.859	36,100		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	1.470	0.350	14,700		Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.140	0.747	31,400		Treated silica	Trade Secret	2	
		TOTALS:	100.000	23.800	1,000,000	Heter	ocyclic organic compound	Trade Secret	2	<u>]</u>
	0.0238 g	Total Mass						Total	100.00	1
his semiconductor device and its homogenous materials c irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	omply with EU Directive 20	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	HS Recast Dire	ctive) and with	EU	0.86				3.61
						0.00	Total (mg)	Chip (Die)	% of Total Weight	3.01
	via internal design controls	, supplier declarations, and /or analytical test data.				0.00	,	7440-21-3	% of Total Weight	3.61
ompliance with the above EU Directives has been verified	_		d. to the best of	Microchip Tec	:hnology	0.00	Doped Silicon	,	100	
	emical substance is NOT a ocument, there is no credibly y regulatory scheme world- ammability standard for pla	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide.	entration of the	chemical subs		0.35	,	7440-21-3	100	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fla	nemical substance is NOT a bocument, there is no credibly y regulatory scheme world- ammability standard for pla s/plastics/	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL IQTM family of databases	entration of the	chemical subs	tance, if		Doped Silicon	7440-21-3 Total	100.00	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fletp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic.	emical substance is NOT a ocument, there is no crediby regulatory scheme world- ambility standard for pla s/plastics/ ped are made from polyviny	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL IQTM family of databases of the unavoidable impurity conce wide.	entration of the	chemical subs	tance, if		Doped Silicon	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	: 1.47
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this drop, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is ship	nemical substance is NOT a pocument, there is no credibly regulatory scheme world- ammability standard for pla is/plastics/ ped are made from polyviny in in this form concerning su st of its knowledge and beli has been compiled based on rets and some information in parts and the average weig	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of the IQTM family of databases of the IQTM plastic. "Window envelopes" used to help the IQTM plastic in the IQTM plastic in Microchip Technology I in the ranges provided in Material Safety Data Sheets provided in the ranges provided in Material Safety Data Sheets provided by subcontract assemblers ght of anticipated significant toxic metals components.	ntration of the to obtain a test old the packing ncorporated's to yield by raw n and raw mater	report at g slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir	ter box and devices in intee the ers. Supplier iformation	0.35	Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	: 1.47
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this dry, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fletp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is ship entain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information teir original packing materials is true and correct to the beompleteness and accuracy of data in this form because it is formation is often protected from disclosure as trade secre provided only as estimates of the average weight of these	nemical substance is NOT a comment, there is no credibly regulatory scheme world- ammability standard for pla is/plastics/ ped are made from polyviny in in this form concerning su st of its knowledge and belified hased on the parts and the average weig d within silicon devices (silicarranty, express or implied,	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of the intention o	intration of the to obtain a test old the packing incorporated significant provided by raw in and raw mater These estimate stion. The exclusion of the stimulation of the stimulation of the stimulation of the stimulation of the stimulation.	report at g slip on the outline of the outline ou	ter box and devices in intee the ers. Supplier information le trace	0.35	Doped Silicon (mg) Total Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	: 1.47
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this dry, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fltp://ul.com/global/eng/pages/offerings/industries/chemical he protective "tubes" in which the specific product is ship entain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information leir original packing materials is true and correct to the beampleteness and accuracy of data in this form because it is formation is often protected from disclosure as trade secre provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials containe icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	nemical substance is NOT a comment, there is no credibly regulatory scheme world-ammability standard for pla s/plastics/ ped are made from polyving an in this form concerning substance of the second place o	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of the least	intration of the to obtain a test old the packing ncorporated's gyl Incorporate ovided by raw n and raw mater These estimate tition. The exclusiale. These are irect or indirect	report at g slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir s do not includ sive, limited pr p provided in N	ter box and devices in intee the irs. Supplier iformation le trace	0.35	Doped Silicon (mg) Total Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	: 1.47
compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship pertain "reels" may be made from PVC plastic. Icrochip Technology Incorporated believes the information eir original packing materials is true and correct to the beampleteness and accuracy of data in this form because it formation is often protected from disclosure as trade secret provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials containe icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated dotations, sales order acknowledgement, and invoices.	nemical substance is NOT a comment, there is no credibly regulatory scheme world-ammability standard for pla s/plastics/ ped are made from polyving an in this form concerning substance of the second place o	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of the least	intration of the to obtain a test old the packing ncorporated's gyl Incorporate ovided by raw n and raw mater These estimate tition. The exclusiale. These are irect or indirect	report at g slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir s do not includ sive, limited pr p provided in N	ter box and devices in intee the irs. Supplier iformation le trace	0.35	Doped Silicon (mg) Total Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00	3.14

MF 8 DFN 10:55 AM : 8/29/2013

Halogen-Free

Basic Substance CAS Number Substances Substances CAS Number Substances CAS Number Substances CAS Number Substances Substances Substances CAS Number Substances S	Termination Base Alloy: Package Homogeneous Materials: Production and Copper Alloy (Cu) 8.1 Electronics (e.g. pc boards, displays)) DFN 4x4 (M8)	CHIP Semiconductor Device Type: MD 08 (Lea
Basic Substance			% Total		Semiconductor Device Type: MD 00 (Lea
Epox Resin IXP = 500-033-0 Trade Secret Mold Compound 2,074 0,031 20,739 Casto Epox Epo	10.20 (mg) Total Mold Compound 9/ of Total Weight	g/part ppm			Basic Substance CAS Number
Principal Resis	38.484 17.279 384,840 Silica, fused 60676-86-0 90.00	7.279 384,840	38.484	Mold Compound	Silica, fused 60676-86-0
Cathon Black 1333-86-4 Mod Compound 0.128 0.088 1.283	2.074 0.931 20,739 Epoxy Resin (NLP # 500-033-5) Trade Secret 4.85	0.931 20,739	2.074	Mold Compound	Epoxy Resin (NLP # 500-033-5) Trade Secret
Copper 1740-90-8 Lead Frame 1.106 0.497 11.061 21.19 (mg) Total Lead Frame 1.0987 0.4033 8.897 10.403 8.897 10.403					
Silver (7440-24-4 Lead Frame 0.087 0.043 8.897-4 (2043 8.997-4 (2043 8.9					
Silver 7440-224 Lead Frame 0.897 0.403 8,967 Znc 7440-266-6 Lead Frame 0.099 0.026 585 Phosphorous 7723-14-0 Lead Frame 0.099 0.071 388 Phosphorous 7723-14-0 Lead Frame 0.099 0.071 388 Anylate resine Proprietary 1766-6 Steel De Altach 0.023 0.011 224 Triangle silver 17723-14-0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.					
Phosphorous		0.497 11,061		Lead Frame	
Phosphorous 17723-14-0 Lead Frame 0.038 0.017 388 Silver 7740-22-4 De Attach 0.913 0.410 9,126 Arrylate resins Proprietary 1740-22-4 De Attach 0.913 0.401 9,126 Treated allow 1740-22-4 De Attach 0.023 0.011 224 De Attach 0.023 0.024	0.897 0.403 8,967 Copper 7440-50-8 95.54	0.403 8,967	0.897	Lead Frame	Silver 7440-22-4
Acrylate resins Proprietary Acrylate resins Proprietary Trade Secret De Attach Acrylate resins Proprietary Trade Secret De Attach De Attach Do 223 0011 234 Neterocycle organic compound Trade Secret De Attach Do 230 0011 234 Neterocycle organic compound Trade Secret De Attach Do 230 0011 234 Degree Gold Trade Secret De Attach Do 230 0011 234 Degree Gold Trade Secret T					
Acyslate resins Proprietary Trade Secret Die Attach 0.023 0.011 234 Treated silica Trade Secret Die Attach 0.023 0.011 234 Treated silica Trade Secret Die Attach 0.023 0.011 234 Trade Secret Die Attach 0.023 0.011 234 0.53 From 1.746/21-3 Crip (Die) 5.470 2.486 6.54,700 1.000					
Treated silica Treate Secret Die Attach 0.023 0.011 234 0.33 (mp) Total Die Attach Note of Total Weight Note Secret Die Attach 0.023 0.011 234 0.33 (mp) Total Die Attach Note of Total Weight Note Secret Die Attach 0.023 0.0114 234 0.35 (mp) Total Die Attach Note Secret Die Attach Die A					
Heterocyclic organic compound Trade Secret Die Attach Silicon 7440-21-3 Chip (Die) 5.470 2.456 5.4700 4.49 2.43 5.400 5.300 0.11 2.34 7.400-27-5					
Silicon 7440:21-3 Chip (Die) 5-870 2.456 5-870 2.456 5-8700 2.456 5-87					
Doped Gold 7440-57-5 Wire Bornd Tin 7440-37-5 Plastrage nearest less by plastrage nearest less because the less than 1 and 1 a	1000				
Tin 1740-315 Patring onestmale lads (pring) - Mater Enri amenated at 1507 Cet 1 fout 1 3.21 (0) 44.9 (100.00) 44.9 (100.00) 40.9					
O.0449 g Total Mass O.0440 g					
0.0449 g Total Mass O.0449 g Total Mass O.0440 g					Tin 7440-31-5
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoH-Of-Life Vehicles (ELV) Directive). Interview 2002/95/EC (RoH-Of-Life Vehicles (ELV) Directive). Interview 2002/95/EC (RoH-Of-Life Vehicles (ELV) Directive). Interview 3002/95/EC (RoH-Of-Life Vehicles). Interview 3002/95/EC (RoH-Of-Life Veh		1,000,000	100.000		
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). 2.46 (mg) Total Chip (De) 3.60 Total Weight Doped Silicon 7.440-21-3 Doped Silicon 7.440-21-3	Total 100.00			g Total Mass	0.0449
semical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology porated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if so not below the threshold of regulatory concern for any regulatory scheme world-wide. In geompounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ rotective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and no "reels" may be made from PVC plastic. Total Wire Bond % of Total Weight of Total will be set of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the leteness and accuracy of data in this form beased on the ranges provided in Material Safety Data Sheets provided by materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the leteness and accuracy of data in this form bease on compiled based on the ranges provided by subcontract assemblers and raw material suppliers. Supplier nation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Supplier nation is often protected from disclosure as trade secrets and some information toxic metals components. These estimates do not include trace of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Chip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this dec	OHS Recast Directive) and with EU 2.46 (mg) Total Chip (Die) % of Total Weight	e) and with EU	Recast Direc	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	
protective worked and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide.	Doped Silicon 7440-21-3 100				th the above EII Directives has been verified via internal design control
//ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and in "reels" may be made from PVC plastic. Doped Gold 7440-57-5 100.00 Total Total Total 100.00 Total Total 100.00 Total Plating on external leads (pins). Matter Tin Jannealed at 150°C for 1 hour Privise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or is Certificate of Compliance for semiconductor products.	Tetal 100.00				·
in "reels" may be made from PVC plastic. In "reels" may be made from PVC plastic plastic plastic provided by Rolf in Microchip's beneficial suppliers.	tentration of the chemical substance, if	nical substance, if	ration of the	n intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer vide.	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no credi with the threshold of regulatory concern for any regulatory scheme works.
chip Technology Incorporated believes the information in this form concerning substances restricted by RoNS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the leteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier nation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information wided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Chip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product interest provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's interest and the conditions of sale and the conditions of s	nd, to the best of Microchip Technology sentration of the chemical substance, if	nical substance, if	ration of the	n intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer vide.	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no crediow the threshold of regulatory concern for any regulatory scheme world bunds used by Microchip meet the UL94 VO flammability standard for pl
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's tations, sales order acknowledgement, and invoices. 1.44 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for 1 hour 1.49 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for 1 hour 4 of Total Weight with the final content of the section of the se	to, to me best of Microchip Technology sentration of the chemical substance, if s to obtain a test report at 0.14 (mg) Total Wire Bond % of Total Weight hold the packing slip on the outer box and Doped Gold 7440-57-5 100	nical substance, if	obtain a test	n intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer vide. stics. You can access the UL iQTM family of databases t	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no credit on the threshold of regulatory concern for any regulatory scheme works used by Microchip meet the UL94 V0 flammability standard for plobal/eng/pages/offerings/industries/chemicals/plastics/ "tubes" in which the specific product is shipped are made from polyving
rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or is Certificate of Compliance for semiconductor products.	pentration of the chemical substance, if s to obtain a test report at 0.14 (mg) Total Wire Bond % of Total Weight	ort at on the outer box and iconductor devices in nnot guarantee the guarantee the trial suppliers. Supplier	obtain a test d the packing corporated's s / Incorporated dded by raw m d raw materia	intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity concervide. stics. You can access the UL iQTM family of databases to the concerning of	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no credit on the threshold of regulatory concern for any regulatory scheme world bunds used by Microchip meet the UL94 V0 flammability standard for plobal/eng/pages/offerings/industries/chemicals/plastics/ "tubes" in which the specific product is shipped are made from polyvir may be made from PVC plastic. Innology Incorporated believes the information in this form concerning sacking materials is true and correct to the best of its knowledge and be and accuracy of data in this form because it has been compiled based of often protected from disclosure as trade secrets and some information y as estimates of the average weight of these parts and the average we
	pentration of the chemical substance, if s to obtain a test report at 0.14 (mg) Total Wire Bond % of Total Weight	on the outer box and iconductor devices in nnot guarantee the rial suppliers. Supplier uppliers. Information not include trace	obtain a test d the packing corporated's s I incorporatedided by raw maderates estimates on. The exclusion	n intentional ingredient in the semiconductor device and be reason to believe that the unavoidable impurity concervide. It is is a case of the UL iQTM family of databases to the Ichloride (PVC) plastic. "Window envelopes" used to be betances restricted by RoHS in Microchip Technology Ir of the date listed in this form. Microchip Technology is the ranges provided in Material Safety Data Sheets provided have been provided by subcontract assemblers at the of anticipated significant toxic metals components. Toon IC) in the finished parts. With respect to the information provided in this declarated.	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no credi with threshold of regulatory concern for any regulatory scheme work with threshold of regulatory concern for any regulatory scheme work with the specific product is shipped are made from polyvir may be made from PVC plastic. "tubes" in which the specific product is shipped are made from polyvir may be made from PVC plastic. Innology Incorporated believes the information in this form concerning sacking materials is true and correct to the best of its knowledge and be and accuracy of data in this form because it has been compiled based often protected from disclosure as trade secrets and some information y as estimates of the average weight of these parts and the average wests, metals, and non-metal materials contained within silicon devices (signalogy Incorporated does not provide any warranty, express or implied vided by Microchip Technology Incorporated and its subsidiaries are contained within subsidiaries are contained with the subsidiaries are contained within subsi
Total 100.00	pentration of the chemical substance, if s to obtain a test report at Doped Gold	on the outer box and iconductor devices in nnot guarantee the rial suppliers. Supplier uppliers. Information not include trace , limited product ovided in Microchip's nsequential or	obtain a test d the packing corporated's s / Incorporated ded by raw m raw materi ese estimates on. The exclusion. These are	in intentional ingredient in the semiconductor device and be reason to believe that the unavoidable impurity concervide. Itics. You can access the UL iQTM family of databases to be concerned in the concerned i	ubstance is absent from the list above, the chemical substance is NOT knowledge and belief as of the date of this document, there is no creditive the threshold of regulatory concern for any regulatory scheme work ounds used by Microchip meet the UL94 V0 flammability standard for plobal/eng/pages/offerings/industries/chemicals/plastics/ "tubes" in which the specific product is shipped are made from polyvir may be made from PVC plastic. Innology Incorporated believes the information in this form concerning stacking materials is true and correct to the best of its knowledge and be and accuracy of data in this form because it has been compiled based offen protected from disclosure as trade secrets and some information y as estimates of the average weight of these parts and the average wets, metals, and non-metal materials contained within silicon devices (signology Incorporated does not provide any warranty, express or implied vided by Microchip Technology Incorporated and its subsidiaries are considered as the content of the content of the content of the users' reliance on the intent of the users' reliance

MD 8 DFN 10:55 AM: 8/29/2013

MICROCHIP				ation Base A	,		•	ogeneous Materials: .g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	a Type: MF 8 (Lead) Γ	DFN-S 6x5 mm (A6 / AW)							ļ	e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	37.77	(mg) Total	Mold Compound	% ot Total Weight	49.12
Silica, fused	60676-86-0	Mold Compound	44.208	33.996	442,080		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.382	1.832	23,823	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.382	1.832	23,823		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.147	0.113	1,474		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	42.960	33.036	429,600			Total		
Tin	7440-31-5	Lead Frame	0.110	0.085	1,103	33.91	(mg) Total	Lead Frame	% of Total Weight	44.1
Silver	7440-22-4	Lead Frame	0.840	0.646	8,401		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.079	0.061	794		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.110	0.085	1,103		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.320	0.246	3,198		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.074	0.057	738		Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.008	0.006	82			Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.008	0.006	82	0.32	(mg) Total	Die Attach	% of Total Weight	0.41
Silicon	7440-21-3	Chip (Die)	2.870	2.207	28,700		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.170	0.131	1,700	:	Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.330	2.561	33,300		Treated silica	Trade Secret	2	
		TOTALS:	100.000	76.900	1,000,000	Heter	ocyclic organic compound	Trade Secret Total	2 100.00	
his semiconductor device and its homogenous materials irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data.	S Recast Direc	tive) and with	EU	2.21	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	2.87
i a chemical substance is absent from the list above, the c ncorporated's knowledge and belief as of the date of this o my, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 VO I	document, there is no credil ny regulatory scheme world flammability standard for pl	ole reason to believe that the unavoidable impurity concerl-wide.	ntration of the o	hemical subs				Total	100.00	
ttn://ul.com/alobal/ana/nages/offerings/industries/chemics		·	o obtain a test	opo u.		0.13	(mg) Total	Wire Bond	% of Total Weight	0.17
http://ul.com/global/eng/pages/offerings/industries/chemica The protective "tubes" in which the specific product is ship pertain "reels" may be made from PVC plastic.	•	nyl chloride (PVC) plastic. "Window envelopes" used to ho		•	ter box and	0.13	(mg) Total Doped Gold	Wire Bond 7440-57-5	% of Total Weight	0.17
The protective "tubes" in which the specific product is ship	pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based o rets and some information se parts and the average we	ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers a light of anticipated significant toxic metals components. T	old the packing ncorporated's s gy Incorporated vided by raw m and raw materia	slip on the ou emiconductor cannot guara aterial supplie al suppliers. Ir	devices in intee the ers. Supplier iformation	0.13			100	0.17
The protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the information heir original packing materials is true and correct to the becompleteness and accuracy of data in this form because it information is often protected from disclosure as trade secs provided only as estimates of the average weight of these	pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based or crets and some information se parts and the average we ed within silicon devices (si warranty, express or implied	ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers a ight of anticipated significant toxic metals components. T licon IC) in the finished parts.	old the packing ncorporated's s gy Incorporated vided by raw m and raw materia 'hese estimates	emiconductor cannot guara aterial supplie al suppliers. Ir do not includ	devices in intee the ers. Supplier iformation le trace	2.56	Doped Gold	7440-57-5	100	
The protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the informatic heir original packing materials is true and correct to the brompleteness and accuracy of data in this form because it information is often protected from disclosure as trade sees provided only as estimates of the average weight of thesevels of dopants, metals, and non-metal materials contain discrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based of crets and some information se parts and the average we ed within silicon devices (si warranty, express or implied d and its subsidiaries are co changes to Material Conter the users' reliance on the in	ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets provided hy subcontract assemblers a light of anticipated significant toxic metals components. T licon IC) in the finished parts. d, with respect to the information provided in this declarat intained in Microchip's standard terms and conditions of subclarations and shall not be liable for any damages, directions of the soft	old the packing accorporated's s gy Incorporated vided by raw m and raw materia rhese estimates tion. The exclus sale. These are	slip on the ou emiconductor cannot guara aterial supplie al suppliers. Ir do not includ sive, limited pr provided in M	devices in antee the ers. Supplier offormation le trace roduct licrochip's		Doped Gold	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100	
the protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information for protective and correct to the bompleteness and accuracy of data in this form because it information is often protected from disclosure as trade sec provided only as estimates of the average weight of these provided only as estimates of the average weight of the experience of dopants, metals, and non-metal materials contain incrochip Technology Incorporated does not provide any arranties provided by Microchip Technology Incorporated uotations, sales order acknowledgement, and invoices. Licrochip disclaims any duty to notify users of updates or therwise, suffered by users or third parties as a result of the process.	pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based of crets and some information se parts and the average we ed within silicon devices (si warranty, express or implied d and its subsidiaries are co changes to Material Conter the users' reliance on the in	ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets provided hy subcontract assemblers a light of anticipated significant toxic metals components. T licon IC) in the finished parts. d, with respect to the information provided in this declarat intained in Microchip's standard terms and conditions of subclarations and shall not be liable for any damages, directions of the soft	old the packing accorporated's s gy Incorporated vided by raw m and raw materia rhese estimates tion. The exclus sale. These are	slip on the ou emiconductor cannot guara aterial supplie al suppliers. Ir do not includ sive, limited pr provided in M	devices in antee the ers. Supplier offormation le trace roduct licrochip's		Doped Gold (mg) Total	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1. bour	100 100.00 100.00 % of Total Weight	

MF 8 DFN-S 10:55 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: MF 10 (Lead) DFN 3x3 mm (E2 / EJ)		nation Base A	•			ogeneous Materials: .g. pc boards, display	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	19.35	(mg) Total	Mold Compound	% ot Total Weight	80.96
Silica, fused	60676-86-0	Mold Compound	72.864	17.414	728,640		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	3.927	0.938	39,266	Epox	y Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.927	0.938	39,266		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.243	0.058	2,429		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	3.544	0.847	35,444			Total	100.00	-
Iron	7439-89-6	Lead Frame	0.087	0.021	872	0.89	(mg) Total	Lead Frame	% of Total Weight	3.71
Silver	7440-22-4	Lead Frame	0.071	0.017	707		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.005	0.001	46		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.003	0.001	31		Silver	7440-22-4	1.91	
Silver Acrylate resins Proprietary	7440-22-4 Trade Secret	Die Attach Die Attach	0.491 0.113	0.117 0.027	4,914 1,134		Zinc Phosphorous	7440-66-6 7723-14-0	0.13 0.08	
Treated silica	Trade Secret	Die Attach	0.113	0.027	1,134		Phosphorous	7723-14-0 Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.013	0.003	126	0.15	(mg) Total	Die Attach	% of Total Weight	0.63
Silicon	7440-21-3	Chip (Die)	9.260	2.213	92,600	0.15	(mg) Total Silver	7440-22-4	% of Total Weight	0.63
Gold	7440-21-3	Wire Bond	0.820	0.196	8,200		Acrylate resins Proprietary	Trade Secret	18	
	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.620	1.104	46,200		Treated silica	Trade Secret	2	
									2	
Tin	7 1 10 01 0	TOTAL S:	100 000	33 000						
nis semiconductor device and its homogenous materials c	0.0239	TOTALS: g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	100.000 HS Recast Direc	23.900 ctive) and with	1,000,000 EU	2.21	rocyclic organic compound Total (mg)	Trade Secret Total Chip (Die)	100.00 % of Total Weight	9.26
	0.0239 omply with EU Directive 2 via internal design control	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and	HS Recast Direct	ctive) and with	EU			Total	100.00	9.26
his semiconductor device and its homogenous materials c frective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch	0.0239 omply with EU Directive 2 via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pi	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh ls, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide.	IS Recast Direction of the contraction of the contr	ctive) and with Microchip Techemical subs	EU		Total (mg)	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	
nis semiconductor device and its homogenous materials c irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fi	0.0239 omply with EU Directive 2 via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. Identical Communication of the C	ds Recast Direct I, to the best of our of the contration of the contration at est	ctive) and with Microchip Tec chemical subs	EU chnology tance, if	2.21	Total (mg) Silicon	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight	
nis semiconductor device and its homogenous materials of irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the choorporated's knowledge and belief as of the date of this dray, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 fit tp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship	0.0239 omply with EU Directive 2 via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ ped are made from polyvia in this form concerning s at of its knowledge and be nas been compiled based t ets and some information parts and the average we	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases in myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology In ilief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. 1	I, to the best of ntration of the obtain a test old the packing ncorporated's s gy Incorporated y raw m and raw materi	Microchip Techemical substreport at semiconductor d cannot guaraterial supplies.	EU chnology tance, if ter box and devices in untee the ers. Supplier formation	2.21	Total (mg) Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
his semiconductor device and its homogenous materials of irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chorporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fltp://lul.com/global/eng/pages/offerings/industries/chemica ne protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information eir original packing materials is true and correct to the be ompleteness and accuracy of data in this form because it I formation is often protected from disclosure as trade secreprovided only as estimates of the average weight of these	0.0239 omply with EU Directive 2 via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ ped are made from polyvia n in this form concerning s st of its knowledge and be nas been compiled based ets and some information parts and the average we d within silicon devices (s arranty, express or implie	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases to nyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology In slilef, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers sight of anticipated significant toxic metals components. T illicon IC) in the finished parts. d, with respect to the information provided in this declara	I, to the best of ntration of the to obtain a test to obtain a test old the packing ncorporated's s gy Incorporated by raw mand raw materi These estimates tion. The exclusion	Microchip Techemical substreport at slip on the outer dearnot guaraterial supplied al suppliers. It is do not includisive, limited p	EU chnology tance, if devices in intee the ers. Supplier information le trace	2.21	Total (mg) Silicon (mg) Total Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight	0.82
nis semiconductor device and its homogenous materials of irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chroorporated's knowledge and belief as of the date of this do to, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fit tp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information ier original packing materials is true and correct to the been provided only a sestimates of the average weight of these vels of dopants, metals, and non-metal materials containe icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	omply with EU Directive 2 via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ ped are made from polyvia in this form concerning s at of its knowledge and be has been compiled based tets and some information parts and the average we d within silicon devices (s arranty, express or implie and its subsidiaries are con- thanges to Material Content te users' reliance on the lie	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases to nyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology II filef, as of the date listed in this form. Microchip Technology II for the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. T illicon IC) in the finished parts. d, with respect to the information provided in this declara- ontained in Microchip's standard terms and conditions of	Is Recast Direct Is, to the best of ntration of the otto obtain a test to obtain a test old the packing incorporated's significant of the obtain and raw materificates estimates the color of the obtained by raw mand raw materificates estimates the obtained by the obtaine	Microchip Techemical substreport at slip on the outside in Microchip I supplied al supplied al suppliers. It is do not include sive, limited per provided in Microchip consequentia, consequentia	EU chnology tance, if devices in intee the ers. Supplier information le trace coduct licrochip's	0.20	Total (mg) Silicon (mg) Total Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.82

MF 10L DFN 10:55 AM : 8/29/2013

AICROCHIP Semiconductor Devi	ce Type: MF 08 (pin)	PDFN 5x6x0.9mm (AS)		nination Base Copper Alloy				nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	56.97	(mg) Total	Mold Compound	% ot Total Weight	54.4
Silica, fused	60676-86-0	Mold Compound	48.960	51.271	489,600		Silica, fused	60676-86-0	90.00	
Epoxy Resin	500-033-5	Mold Compound	2.638	2.763	26,384	i	Epoxy Resin	500-033-5	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.638	2.763	26,384	1	Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.163	0.171	1,632	1	Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	16.394	17.168	163,942			Total	100.00	•
Iron	7439-89-6	Lead Frame	0.403	0.422	4,033	17.97	(mg) Total	Lead Frame	% of Total Weight	17.16
Silver	7440-22-4	Lead Frame	0.327	0.342	3,269		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.021	0.022	215	l	Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.014	0.015	142		Silver	7440-22-4	1.91	
Copper	7440-50-8	Clip Attachment (92.5/5/2.5 PbSnAg)	14.697	15.391	146,970	1	Zinc	7440-66-6	0.13	
Iron	7439-89-6	Clip Attachment (92.5/5/2.5 PbSnAg)	0.354	0.371	3,544		Phosphorous	7723-14-0	0.08	
Zinc	7440-66-6	Clip Attachment (92.5/5/2.5 PbSnAg)	0.018	0.019	181			Total	100.00	
Phosphorous	7723-14-0	Clip Attachment (92.5/5/2.5 PbSnAg)	0.011	0.011	106	15.79	(mg) Total	Clip	% of Total Weight	15.08
Lead	7439-92-1	Clip Attachment (92.5/5/2.5 PbSnAg)	6.346	6.645	63,455		Copper	7440-50-8	97.46	
Silver	7440-22-4	Clip Attachment (92.5/5/2.5 PbSnAg)	0.343	0.359	3,430		Iron	7439-89-6	2.35	
Tin	7440-31-5	Clip Attachment (92.5/5/2.5 PbSnAg)	0.172	0.180	1,715		Zinc	7440-66-6	0.12	
Silicon	7440-21-3	Chip (Die)	3.290	3.445	32,900		Phosphorous	7723-14-0	0.07	
Doped Gold	7440-57-5	Wire Bond	0.830	0.869	8,300			Total	100.00	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.380	2,492	23.800	7.18	(mg) Total	Clip Attachment (92.5/5/2.5 PbSnAg)	% of Total Weight	6.86
	1110010	TOTALS:				High temp				
			100.000	104.720	1,000,000	solder	Lead	7439-92-1	92.50	
					,,.					
comicanductor davice and its homogenous materials		g Total Mass	motion 7(a):	l ead in high n			Silver	7440-22-4	5.00	
perature type solders (i.e. lead-based alloys containin	comply with EU Directive 20 g 85% by weight or more lead	02/95/EC (RoHS Directive) uses EU-RoHS application exer l.	mption 7(a):	Lead in high n						
erature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verifie hemical substance is absent from the list above, the	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and,	to the best o	of Microchip To	nelting	3 45	Silver Tin	7440-22-4 7440-31-5 Total	5.00 2.50 100.00	3.29
erature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verified hemical substance is absent from the list above, the porated's knowledge and belief as of the date of this t below the threshold of regulatory concern for any r	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent.	to the best o	of Microchip To e chemical sub	nelting	3.45	Silver	7440-22-4 7440-31-5	5.00 2.50	3.29
perature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verified themical substance is absent from the list above, the rporated's knowledge and belief as of the date of this but below the threshold of regulatory concern for any re ling compounds used by Microchip meet the UL94 VO	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for pla	02/295/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	to the best o	of Microchip To e chemical sub	nelting	3.45	Silver Tin	7440-22-4 7440-31-5 Total	5.00 2.50 100.00 % of Total Weight	3.29
perature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verified chemical substance is absent from the list above, the rporated's knowledge and belief as of the date of this but below the threshold of regulatory concern for any re ling compounds used by Microchip meet the UL94 Vo //ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is she	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for pla cals/plastics/	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent.	to the best of tration of the obtain a tes	of Microchip To e chemical sub st report at	nelting echnology estance, if any,	3.45	Silver Tin (mg) Total	7440-22-4 7440-31-5 Total Chip (Die)	5.00 2.50 100.00 % of Total Weight	3.29
perature type solders (i.e. lead-based alloys containing pliance with the above EU Directives has been verified themical substance is absent from the list above, the reporated's knowledge and belief as of the date of this of below the threshold of regulatory concern for any reding compounds used by Microchip meet the UL94 Voc/l/ul.com/global/eng/pages/offerings/industries/chemiprotective "tubes" in which the specific product is shain "reels" may be made from PVC plastic. Ochip Technology Incorporated believes the informate original packing materials is true and correct to the lepleteness and accuracy of data in this form because mation is often protected from disclosure as trade seminators.	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for pla cals/plastics/ ipped are made from polyving ion in this form concerning su best of its knowledge and beli t has been compiled based or crets and some information or parts and the average weigh	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent. stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Interface of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers at to fanticipated significant toxic metals components. Thee	to the best of tration of the obtain a test of the packin corporated's y Incorporate ided by raw and raw mater.	of Microchip To e chemical substances at streport at ag slip on the constances ed cannot gua material suppi rial suppliers.	echnology stance, if any, outer box and or devices in rantee the liers. Supplier Information is	3.45	Silver Tin (mg) Total	7440-22-4 7440-31-5 Total Chip (Die) 7440-21-3	5.00 2.50 100.00 % of Total Weight	
perature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verified themical substance is absent from the list above, the reporated's knowledge and belief as of the date of this at below the threshold of regulatory concern for any reling compounds used by Microchip meet the UL94 Vol/ful.com/global/eng/pages/offerings/industries/chemiprotective "tubes" in which the specific product is shain "reels" may be made from PVC plastic. Dochip Technology Incorporated believes the informat original packing materials is true and correct to the lepleteness and accuracy of data in this form because mation is often protected from disclosure as trade seided only as estimates of the average weight of these oppants, metals, and non-metal materials contained with the provided by Microchip Technology Incorporated does not provide any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided any anties provided by Microchip Technology Incorporated to the provided by Microchip T	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for placals/plastics/ ipped are made from polyving the first form concerning supest of its knowledge and bell to has been compiled based or crets and some information reparts and the average weigh thin silicon devices (silicon IC warranty, express or implied	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent. stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Interface of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers at to fanticipated significant toxic metals components. Thee	to the best of tration of the obtain a test obtain a test of the packin corporated's y Incorporate ided by raw and raw mates e estimates	of Microchip To e chemical substance of the streport at ag slip on the construction semiconducted cannot gua material suppliers, do not include usive, limited	echnology stance, if any, outer box and or devices in rantee the liers. Supplier Information is e trace levels		Silver Tin (mg) Total Doped Silicon	7440-22-4 7440-31-5 Total Chip (Die) 7440-21-3	5.00 2.50 100.00 % of Total Weight 100	
perature type solders (i.e. lead-based alloys containing pliance with the above EU Directives has been verified themical substance is absent from the list above, the reporated's knowledge and belief as of the date of this at below the threshold of regulatory concern for any reling compounds used by Microchip meet the UL94 Vol/ful.com/global/eng/pages/offerings/industries/chemip protective "tubes" in which the specific product is shain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the informated original packing materials is true and correct to the lepteness and accuracy of data in this form because mation is often protected from disclosure as trade seriated only as estimates of the average weight of these oppants, metals, and non-metal materials contained with ochip Technology Incorporated does not provide any anties provided by Microchip Technology Incorporated attions, sales order acknowledgement, and invoices.	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for placals/plastics/ ipped are made from polyving the place of its knowledge and belied thas been compiled based of crets and some information reparts and the average weigh thin silicon devices (silicon IC warranty, express or implied and its subsidiaries are controlled to the control of t	02/95/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent. Instices. You can access the UL iQTM family of databases to apply the concent of the c	to the best of tration of the obtain a test of the packin corporated's y Incorporate ided by raw and raw mates e estimates on. The exchale. These and ect or indirect of the state of the packing of the	of Microchip To e chemical sub- streport at ag slip on the co- semiconducted ed cannot gua material suppliers. do not include usive, limited in re provided in	echnology stance, if any, buter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's		Silver Tin (mg) Total Doped Silicon (mg) Total	7440-22-4 7440-31-5 Total Chip (Die) 7440-21-3 Total Wire Bond	5.00 2.50 100.00 % of Total Weight 100 100.00	
perature type solders (i.e. lead-based alloys containin pliance with the above EU Directives has been verifie hemical substance is absent from the list above, the prorated's knowledge and belief as of the date of this t below the threshold of regulatory concern for any ring compounds used by Microchip meet the UL94 Vol/ful.com/global/eng/pages/offerings/industries/chemiprotective "tubes" in which the specific product is shin "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the informat original packing materials is true and correct to the lepteness and accuracy of data in this form because mation is often protected from disclosure as trade setied only as estimates of the average weight of these opents, metals, and non-metal materials contained with the provided by Microchip Technology Incorporated does not provide any anties provided by Microchip Technology Incorporated tons, sales order acknowledgement, and invoices.	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for placals/plastics/ ipped are made from polyving the place of its knowledge and belied thas been compiled based of crets and some information reparts and the average weigh thin silicon devices (silicon IC warranty, express or implied and its subsidiaries are controlled to the control of t	20/295/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent. Stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology in the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers at of anticipated significant toxic metals components. These in the finished parts. , with respect to the information provided in this declaration tained in Microchip's standard terms and conditions of standard and shall not be liable for any damages, directions and shall not be liable for any damages.	to the best of tration of the obtain a test of the packin corporated's y Incorporate ided by raw and raw mates e estimates on. The exchale. These and ect or indirect of the state of the packing of the	of Microchip To e chemical sub- streport at ag slip on the co- semiconducted ed cannot gua material suppliers. do not include usive, limited in re provided in	echnology stance, if any, buter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's		Silver Tin (mg) Total Doped Silicon (mg) Total	7440-22-4 7440-31-5 Total Chip (Die) 7440-21-3 Total Wire Bond	5.00 2.50 100.00 % of Total Weight 100 100.00 % of Total Weight	0.83
erature type solders (i.e. lead-based alloys containing a liance with the above EU Directives has been verified the memical substance is absent from the list above, the porated's knowledge and belief as of the date of this below the threshold of regulatory concern for any rang compounds used by Microchip meet the UL94 Volut.com/global/eng/pages/offerings/industries/chemicrotective "tubes" in which the specific product is shin "reels" may be made from PVC plastic. The Technology Incorporated believes the informat original packing materials is true and correct to the leiteness and accuracy of data in this form because nation is often protected from disclosure as trade seded only as estimates of the average weight of these pants, metals, and non-metal materials contained with the control of the provided any disclosure as trade seded only as estimates of the average weight of these pants, metals, and non-metal materials contained with the control of the provided by Microchip Technology Incorporated toos, sales order acknowledgement, and invoices. Schip disclaims any duty to notify users of updates o wise, suffered by users or third parties as a result of with the par	comply with EU Directive 20 g 85% by weight or more lead d via internal design controls chemical substance is NOT a document, there is no credib egulatory scheme world-wide flammability standard for placals/plastics/ ipped are made from polyving the place of its knowledge and belied thas been compiled based of crets and some information reparts and the average weigh thin silicon devices (silicon IC warranty, express or implied and its subsidiaries are controlled to the control of t	20/295/EC (RoHS Directive) uses EU-RoHS application exert. , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent. Stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology in the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers at of anticipated significant toxic metals components. These in the finished parts. , with respect to the information provided in this declaration tained in Microchip's standard terms and conditions of standard and shall not be liable for any damages, directions and shall not be liable for any damages.	to the best of tration of the obtain a test of the packin corporated's y Incorporate ided by raw and raw mates e estimates on. The exchale. These and ect or indirect of the state of the packing of the	of Microchip To e chemical sub- streport at ag slip on the co- semiconducted ed cannot gua material suppliers. do not include usive, limited in re provided in	echnology stance, if any, buter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's	0.87	Silver Tin (mg) Total Doped Silicon (mg) Total Doped Gold	7440-22-4 7440-31-5 Total Chip (Die) 7440-21-3 Total Wire Bond Plating on external leads (pins) - Matte Tin / annealed at 150°C for	5.00 2.50 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	0.83

MF 08 PDFN 10:56 AM : 8/29/2013

MICROCHIP Semiconductor Device 1	Figure MVV 06 (1-10)	IDEN area our (40)		ation Base A				ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Semiconductor Device	ype. Will 00 (Lead)									64
Barda Outarian	040 November	"Contained In" Sub-Component	% Total Weight			7.20	(mg) Total	Mold Compound	% ot Total Weight	59.97
Basic Substance	CAS Number	•		mg/part	ppm		,		_	•
Silica, vitreous (or fused)	60676-86-0	Mold Compound	50.975	6.117	509,745		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	5.217	0.626	52,174		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin Carbon Black	Trade Secret 1333-86-4	Mold Compound Mold Compound	3.598 0.180	0.432 0.022	35,982 1,799		Phenolic Resin	Trade Secret 1333-86-4	6.00 0.30	
		Lead Frame	32.712	3.925	327.123		Carbon Black		100.00	<u> </u>
Copper	7440-50-8							Total		
Iron	7439-89-6	Lead Frame	0.773	0.093	7,733	4.03	(mg) Total	Lead Frame	% of Total Weight	33.62
Phosphorous	7723-14-0	Lead Frame	0.084	0.010	841		Copper	7440-50-8	97.30	
Zinc (Metal)	7440-66-0	Lead Frame	0.050	0.006	504		Iron	7439-89-6	2.30	,
Silver	7440-22-4	Die Attach	0.886	0.106	8,856		Phosphorous	7723-14-0	0.25	
Epoxy Resin	9003-36-5	Die Attach	0.226	0.027	2,256		Zinc (Metal)	7440-66-0	0.15	
t-Butyl phenyl glycidyl ether	3101-60-8	Die Attach	0.076	0.009	756			Total	100.00	
Phenolic hardener	92-88-6	Die Attach	0.004	0.000	36	0.14	(mg) Total	Die Attach	% of Total Weight	1.2
Butyl cellosolve acetate	112-07-2	Die Attach	0.010	0.001	96		Silver	7440-22-4	74	
Silicon	7440-21-3	Chip (Die)	4.010	0.481	40,100		Epoxy Resin	9003-36-5	19	
Gold	7440-57-5	Wire Bond	0.770	0.092	7,700		t-Butyl phenyl glycidyl ether	3101-60-8	6	
Nickel	7440-02-0	Plating on external leads (pins)	0.406	0.049	4,064		Phenolic hardener	92-88-6	0	
Palladium	7440-05-03	Plating on external leads (pins)	0.022	0.003	215		Butyl cellosolve acetate	112-07-2	1	
Gold	7440-57-5	Plating on external leads (pins)	0.002	0.000	22			Total	100.00	
		TOTALS:	100.000	12.000	1,000,000	0.48	Total (mg)	Chip (Die)	% of Total Weight	4.01
	0.0120 g To	otal Mass					Doped Silicon	7440-21-3	100	
is semiconductor device and its homogenous materials con ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified vi			HS Recast Dire	ective) and w	ith EU	0.09	(mg) Total	Total Wire Bond	100.00	
a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this doc ny, is not below the threshold of regulatory concern for any	mical substance is NOT an int cument, there is no credible re regulatory scheme world-wide	entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce	entration of the	chemical su			Doped Gold	7440-57-5	100	
olding compounds used by Microchip meet the UL94 V0 flants: p://ul.com/global/eng/pages/offerings/industries/chemicals		. You can access the UL IQTM family of databases	to obtain a tes	t report at				lotai	100.00	
the protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic.	ed are made from polyvinyl ch	oride (PVC) plastic. "Window envelopes" used to h	old the packin	g slip on the	outer box	0.05	(mg) Total	Plating on external leads (pins)	% of Total Weight	0.43
flicrochip Technology Incorporated believes the information in their original packing materials is true and correct to the beine completeness and accuracy of data in this form because is supplier information is often protected from disclosure as trainformation is provided only as estimates of the average weigh clude trace levels of dopants, metals, and non-metal materia	est of its knowledge and belief it has been compiled based or de secrets and some informat ht of these parts and the aver	as of the date listed in this form. Microchip Techno the ranges provided in Material Safety Data Sheets ion may not have been provided by subcontract ass age weight of anticipated significant toxic metals co	ology Incorpor s provided by r semblers and	ated cannot of aw material s aw material s	guarantee suppliers. suppliers.		Nickel	7440-02-0	94.50	
Microchip Technology Incorporated does not provide any war warranties provided by Microchip Technology Incorporated a Microchip's quotations, sales order acknowledgement, and in	nd its subsidiaries are contain						Palladium	7440-05-3	5.00	
Microchip disclaims any duty to notify users of updates or ch otherwise, suffered by users or third parties as a result of the or of this Certificate of Compliance for semiconductor produc	users' reliance on the information						Gold	7440-57-5	0.50	
										J

icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in eir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's according to the contained of the users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or herwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or	MICROCHIP Semiconductor Device	Type: MNY 08 (Lead)	TDFN 2x3x0.5mm (5Q)		ation Base A oper Alloy (C	,			ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e4
Sites, virtues (or fused)	Basic Substance	CAS Number			mg/part	ppm	8.40	(mg) Total	Mold Compound	% ot Total Weight	59.97
Epon Resident Traigs Secret Model Compound 0.508 0.501 0.501 0.502 0.502 0.503 0.501 0.502 0.502 0.503 0.502 0.503 0.502 0.503 0.5		60676-86-0	Mold Compound	50 975				Silica vitreous (or fused)	60676-86-0	85.00	
Pierce P											
Copper 7440-96-8 Lead Frame 0.773 0.763 0.774 0.77											
Phosphorous 7723-140 Leas Frame 0.084 0.012 641 Copper 7405-06 9730 730 730 730 730 730 730 730 730 730	Carbon Black	1333-86-4	Mold Compound	0.180	0.025	1,799		Carbon Black	1333-86-4	0.30	
Phosphorous (7723-14-0) Lead Frame (0.094 0.012 841 Capper (7723-14-0) Lead Frame (0.094 0.007 554 Capper (7723-14-0) Lead Frame (0.094 0.007 554 Capper (7723-14-0) Lead Frame (0.094 0.007 554 Capper (7723-14-0) Lead Frame (0.094 0.003 240 0.003	Copper	7440-50-8	Lead Frame	32.712	4.580	327,123			Total	100.00	
Trace Properties Properties Trace Properties Prope	Iron	7439-89-6	Lead Frame	0.773	0.108	7,733	4.71	(mg) Total	Lead Frame	% of Total Weight	33.62
Sheri Projectory 1746-Secret Die Attach 0.938 0.131 0.360 Acyteta resines Proprietary 1746-Secret Die Attach 0.216 0.030 2.140 Trainstot silico Traised secret Die Attach 0.024 0.033 240 Traised secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Attach 0.024 0.003 240 Meteococicio organic compound 1760-Secret Die Meteococicio organic orga	Phosphorous	7723-14-0	Lead Frame	0.084	0.012	841		Copper	7440-50-8	97.30	
Acytelure teams Proprietary Trade Secret Die Attach 0.216 0.003 2.40 Treated allica Trade Secret Die Attach 0.024 0.003 2.40 Trade of Compound Trade Secret Die Attach 0.024 0.003 2.40 Drade Secret Die Die Attach 0.002 1.40 Drade Secret Die Die Die Attach 0.002 1.40 Drade Secret Die Die Die Attach 0.002 1.40 Drade Secret Die	Zinc (Metal)		Lead Frame	0.050	0.007	504		Iron	7439-89-6	2.30	
Treated silica Trade Secret Die Attach 0.024 0.003 240 0.77 (mol Total Die Attach 1.024 0.003 240 0.001 0.003 0.											
Heterocyclic organic compound Trade Secret De Attach (1) Chyp (De) 4 and 10 0,054 1 40,000 1,0561 40								Zinc (Metal)			
Silicon 7440:21-3 Chip (Die) 4.010 0.561 40,100 Chip (Die) 4.010 0.561 40,100 Chip (Die) 4.010 Chip (Die) 4.000 Chip (Die) 4.									Total		
Roded 7440-02-0 Pisting on external leads (pins) 0.412 0.058 4,116 Trades Secret 18 Trades Secret 2 Pisting on external leads (pins) 0.014 0.002 139 Heter goods creamer compound Trades Secret 2 Pisting on external leads (pins) 0.014 0.002 139 Heter goods (pins) 1,000,000 1,000,000 1,000,000 1,000,000							0.17	(mg) Total		% of Total Weight	1.2
Nickel 7440-02-0 Plating on external leads (pins) 0.014 0.002 139 Gold 7440-57-5 Plating on external leads (pins) 0.004 0.001 4.000 1.000,000 1.0											
Falladium 5/3/74/0 Plating on external leads (pins) 0.014 0.0002 139 Heterecodic organic commound Trade Secret 2											
Gold 7440-57-6 Plating on external leads (pins) TOTALS: 100.000 1,000,000 0.56 Total (mg) Chip (Dio) % of Total (mg) Chip (Dio) %											
O.0140 g Total Mass Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS) Directive). Doped Sillocon 7440-21-3 100.00 Do							Hete	rocyclic organic compound			
O.9140 g Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoH-G)-Life Vehicles (ELV) Directive). Dipliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. a chemical substance is absent from the lists above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for yeight of the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and retain "reels" may be made from PVC plastic. Total 100.00 Doped Gold 7440-57-5 100 Doped Gold 7440-57-5 10	Gold	7440-57-5									
Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive). 100.00 10			TOTAL	S: 100.000	14.000	1,000,000	0.56	Total (mg)	Chip (Die)	% of Total Weight	4.01
a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Doped Gold 7440-57-5 100		mply with EU Directive 2002/95	J/EC (ROHS Directive), EU Directive 2011/65/EU	(ROHS Recast Dire	ctive) and witi	n EU			lotai	100.00	
Doped Gold 7440-57-5 100 y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. olding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ report in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and irritain "relsi" may be made from PVC plastic. icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the information is often protected from disclosure as trade secrets and some information may not have been provided in Material Safety Datas Sheets; meetlas, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided by subcontract assemblers and raw material suppliers. Supplier of these parts and the average weight of amicipated significant toxic metals components. These estimates do not include trace velse of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's outering so order acknowledgement, and invoices. icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's outering so order acknowledgement, and invoices. icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the inf	ompliance with the above EU Directives has been verified v	ia internal design controls, sur	pplier declarations, and /or analytical test data.				0.11	(mg) Total	Wire Bond	% of Total Weight	0.77
tp://ul.com/globa/leng/pages/offerings/industries/chemicals/plastics/ ne protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ricin "reels" may be made from PVC plastic. Description Plating on external leads (pins) Plating on external	ncorporated's knowledge and belief as of the date of this do	cument, there is no credible re	ason to believe that the unavoidable impurity co								
retain "reels" may be made from PVC plastic. 0.06 (mg) Total leads (pins) word Total Weight 0.43		mmability standard for plastice	1.		Chemical Sub	starioc, ii		Doped Gold	7440-57-5	100	
eir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the impleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's palladium of the variation of the variation provided in Microchip's palladium of the variation provided in Microchip's palladium of the variation provided in Microchip's palladium of the variation provided pr						otunioe, n		Doped Gold			
arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's palladium 7440-05-3 3.23 lotations, sales order acknowledgement, and invoices. Icrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or therewise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	http://ul.com/global/eng/pages/offerings/industries/chemicals	s/plastics/	s. You can access the UL iQTM family of databa	ses to obtain a test	report at	·	0.06	·	Total Plating on external	100.00	0.43
herwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third party test rep	http://ul.com/global/eng/pages/offerings/industries/chemicals The protective "tubes" in which the specific product is shipp tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the besi completeness and accuracy of data in this form because it he information is often protected from disclosure as trade secre s provided only as estimates of the average weight of these	s/plastics/ ped are made from polyvinyl ch in this form concerning substat t of its knowledge and belief, a as been compiled based on the test and some information may i parts and the average weight of	s. You can access the UL IQTM family of databa loride (PVC) plastic. "Window envelopes" used ances restricted by RoHS in Microchip Technolo s of the date listed in this form. Microchip Tech e ranges provided in Material Safety Data Sheets not have been provided by subcontract assemb of anticipated significant toxic metals componer	ses to obtain a test to hold the packing ogy Incorporated's nology Incorporate s provided by raw r lers and raw mater	t report at g slip on the o semiconducto d cannot guar naterial suppli ial suppliers. I	uter box and or devices in antee the iers. Supplier Information	0.06	(mg) Total	Total Plating on external leads (pins)	100.00 % of Total Weight	0.43
	http://ul.com/global/eng/pages/offerings/industries/chemicals The protective "tubes" in which the specific product is shipp tertain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it he information is often protected from disclosure as trade secre s provided only as estimates of the average weight of these evels of dopants, metals, and non-metal materials contained Alicrochip Technology Incorporated does not provide any wa	s/plastics/ ped are made from polyvinyl ch in this form concerning substat t of its knowledge and belief, a as been compiled based on the test and some information may i parts and the average weight of the within silicon devices (silicon arranty, express or implied, with	s. You can access the UL iQTM family of databa loride (PVC) plastic. "Window envelopes" used ances restricted by RoHS in Microchip Technolo s of the date listed in this form. Microchip Tech e ranges provided in Material Safety Data Sheets not have been provided by subcontract assemb of anticipated significant toxic metals componer IC) in the finished parts.	to hold the packing ogy Incorporated's nology Incorporated's provided by raw relers and raw mater tts. These estimate claration. The exclu	report at g slip on the o semiconducto d cannot guar naterial suppli ial suppliers. I s do not inclu	uter box and or devices in antee the iers. Supplier information de trace	0.06	(mg) Total Nickel	Plating on external leads (pins) 7440-02-0	100.00 % of Total Weight 95.73	0.43
	http://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shipp rertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it han formation is often protected from disclosure as trade secre s provided only as estimates of the average weight of these evels of dopants, metals, and non-metal materials contained Microchip Technology Incorporated does not provide any wa warranties provided by Microchip Technology Incorporated a juotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or chem.	s/plastics/ ped are made from polyvinyl ch in this form concerning substa it of its knowledge and belief, a as been compiled based on the ets and some information may i parts and the average weight of a within silicon devices (silicon urranty, express or implied, with and its subsidiaries are contain thanges to Material Content Dec e users' reliance on the informa-	s. You can access the UL IQTM family of databatoride (PVC) plastic. "Window envelopes" used ances restricted by RoHS in Microchip Technolos of the date listed in this form. Microchip Technolos of the date listed in this form. Microchip Technolos of the provided in Material Safety Data Sheets not have been provided by subcontract assemb of anticipated significant toxic metals componer IC) in the finished parts. In respect to the information provided in this decled in Microchip's standard terms and condition clarations and shall not be liable for any damage	ses to obtain a test to hold the packing ogy Incorporated's nology Incorporate s provided by raw r lers and raw mater ats. These estimate claration. The exclusion of sale. These ar es, direct or indirec-	e report at g slip on the o semiconducto d cannot guar naterial suppli ial suppliers. I is do not inclu usive, limited p e provided in l t, consequent	or devices in cantee the iers. Supplier information de trace product Microchip's	0.06	(mg) Total Nickel Palladium	Plating on external leads (pins) 7440-02-0 7440-05-3	95.73	0.43

MNY 8 TDFN 10:56 AM : 8/29/2013

MICROCHIP				nation Base A	•		•	ogeneous Materials: .g. pc boards, display	vs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	e Type: QAE 8 (Lead)	TDFN-S 6x5x0.8mm (U3)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	38.82	(mg) Total	Mold Compound	% ot Total Weight	52.6
Silica, fused	60676-86-0	Mold Compound	47.340	34.937	473,400		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.551	1.883	25,511	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.551	1.883	25,511	·	Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.158	0.116	1,578		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	38.215	28.203	382,150			Total	100.00	
Iron	7439-89-6	Lead Frame	0.940	0.694	9,400	29.52	(mg) Total	Lead Frame	% of Total Weight	40
Silver	7440-22-4	Lead Frame	0.762	0.562	7,620		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.050	0.037	500		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.033	0.024	330		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.704	0.520	7,040		Zinc	7440-66-6	0.13	
Epoxy Resin	Trade Secret	Die Attach	0.150	0.110	1,496		Phosphorous	7723-14-0	0.08	
Copper (Cu)	7440-50-8	Die Attach	0.026	0.019	264			Total	100.00	
Silicon	7440-21-3	Chip (Die)	5.140	3.793	51,400	0.65	(mg) Total	Die Attach	% of Total Weight	0.88
Gold	7440-57-5	Wire Bond	0.270	0.199	2,700		Silver (Ag)	7440-22-4	80	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.110	0.819	11,100		Epoxy Resin	Trade Secret	17	
		TOTALS:	100.000	73.800	1,000,000		Copper (Cu)	7440-50-8	3	
	0.0738	g Total Mass						Total	100.00	
This semiconductor device and its homogenous materials	comply with Lo Directive L									
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified		s, supplier declarations, and /or analytical test data.	io recoust birec	cuve) and with	I EU	3.79	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	5.14
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the c incorporated's knowledge and belief as of the date of this c any, is not below the threshold of regulatory concern for an	I via internal design control hemical substance is NOT document, there is no credil ny regulatory scheme world	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce -wide.	, to the best of ntration of the o	Microchip Tec	chnology		, 0,	,	100	
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the concerning the date of this concerning the date of this concerning the same of the date of this concerning the date of this concerning to the date of this concerning the date of this concerning the date of the date of this concerning the date of this concerning the date of the date of the date of this concerning the date of the date of this concerning the date of th	I via internal design control themical substance is NOT document, there is no credi ny regulatory scheme world flammability standard for pl als/plastics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce -wide. astics. You can access the UL iQTM family of databases to	, to the best of ntration of the o obtain a test	Microchip Techemical subs	chnology stance, if	0.20	, 0,	7440-21-3	100	
	I via internal design control themical substance is NOT document, there is no credi ny regulatory scheme world flammability standard for pl als/plastics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce -wide. astics. You can access the UL iQTM family of databases to	, to the best of ntration of the o obtain a test	Microchip Techemical subs	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c Incorporated's knowledge and belief as of the date of this c any, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 f http://ul.com/global/eng/pages/offerings/industries/chemica The protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic.	I via internal design control chemical substance is NOT document, there is no credi ny regulatory scheme world flammability standard for pl als/plastics/ pped are made from polyvir	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to be the control of th	i, to the best of ntration of the co obtain a test	Microchip Techemical substreport at	chnology stance, if uter box and		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.27
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this concorporated's knowledge and belief as of the date of this concorporated is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 fhttp://ul.com/global/eng/pages/offerings/industries/chemica The protective "tubes" in which the specific product is ship	I via internal design control themical substance is NOT document, there is no credil ny regulatory scheme world llammability standard for pl als/plastics/ pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based o crets and some information te parts and the average we	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to yll chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology II lief, as of the date listed in this form. Microchip Technologo to the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers light of anticipated significant toxic metals components. T	to the best of ntration of the coordinates of the c	Microchip Techemical substreport at slip on the outer semiconductor d cannot guaraterial suppliers. In	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.27
Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c incorporated's knowledge and belief as of the date of this cany, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 f http://ul.com/global/eng/pages/offerings/industries/chemica The protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the be completeness and accuracy of data in this form because it information is often protected from disclosure as trade sec is provided only as estimates of the average weight of these	I via internal design control themical substance is NOT document, there is no credi ny regulatory scheme world flammability standard for pl als/plastics/ pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based of crets and some information the parts and the average we ed within silicon devices (si warranty, express or implier	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technologo the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers. Ight of anticipated significant toxic metals components. Telicon IC) in the finished parts.	to the best of ntration of the coordinates of the packing neorporated by raw mandr in these estimates of the packing.	Microchip Techemical substreport at slip on the outsemiconductor deannot guaraterial supplie all suppliers. It is do not includisive, limited p	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.27
Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c Incorporated's knowledge and belief as of the date of this c any, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 f http://ul.com/global/eng/pages/offerings/industries/chemica. The protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the be completeness and accuracy of data in this form because it information is often protected from disclosure as trade sec is provided only as estimates of the average weight of thes levels of dopants, metals, and non-metal materials contains. Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated warranties provided poly Microchip Technology Incorporated warranties provided poly Microchip Technology Incorporated poly Incorporated	I via internal design control themical substance is NOT document, there is no credit ny regulatory scheme world ilammability standard for pl als/plastics/ pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based of crets and some information the parts and the average we ed within silicon devices (si warranty, express or implied and its subsidiaries are co- changes to Material Conter the users' reliance on the ir	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In idef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. Tilicon IC) in the finished parts. If, with respect to the information provided in this declarational in Microchip's standard terms and conditions of t Declarations and shall not be liable for any damages, dit	to the best of ntration of the or oobtain a test old the packing incorporated's significant of the object of the o	Microchip Terchemical substreport at slip on the outgoing and suppliers. It is do not included by provided in Marchael suppliers. It is do not included by provided in Marchael suppliers. It is consequential suppliers. It is do not included by provided in Marchael substreport in Marchael substruction in Marchael	chnology stance, if iter box and r devices in antee the ers. Supplier information de trace roduct flicrochip's	0.20	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.27
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this cany, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 fittp://ul.com/global/eng/pages/offerings/industries/chemicatherians/industries/	I via internal design control themical substance is NOT document, there is no credit ny regulatory scheme world ilammability standard for pl als/plastics/ pped are made from polyvir on in this form concerning s est of its knowledge and be has been compiled based of crets and some information the parts and the average we ed within silicon devices (si warranty, express or implied and its subsidiaries are co- changes to Material Conter the users' reliance on the ir	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In idef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. Tilicon IC) in the finished parts. If, with respect to the information provided in this declarational in Microchip's standard terms and conditions of t Declarations and shall not be liable for any damages, dit	to the best of ntration of the or oobtain a test old the packing incorporated's significant of the object of the o	Microchip Terchemical substreport at slip on the outgoing and suppliers. It is do not included by provided in Marchael suppliers. It is do not included by provided in Marchael suppliers. It is consequential suppliers. It is do not included by provided in Marchael substreport in Marchael substruction in Marchael	chnology stance, if iter box and r devices in antee the ers. Supplier information de trace roduct flicrochip's	0.20	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.27

QAE 8 TDFN-S 10:56 AM : 8/29/2013

AICROCHIP Semicenduster Device 1	[vmov 02AF 09 v	ead) TDFN-S 6x8x0.8mm (S9)		ation Base A				ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device	Type: QZAE U8(L	ead) IDFN-5 6x8x0.8mm (S9) "Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	52.55	(mg) Total	Mold Compound	% ot Total Weight	37.14
Fused Silica	60676-86-0	Mold Compound	32.869	46.509	328.689		Fused Silica	60676-86-0	88.50	
Epoxy Resin 1	Trade Secret	Mold Compound	2.414	3.416	24,141		Epoxy Resin	Trade Secret	6.50	
Phenol Resin	Trade Secret	Mold Compound	1.764	2.496	17,642		Phenol Resin	Trade Secret	4.75	
Carbon Black	1333-86-4	Mold Compound	0.093	0.131	929		Carbon Black	1333-86-4	0.25	
Copper	7440-50-8	Lead Frame	47.490	67.199	474,904	'-		Total	100.00	
Silver	7440-22-4	Lead Frame	3.287	4.651	32,867	73.82	(mg) Total	Lead Frame	% of Total Weight	52.17
Iron	7439-89-6	Lead Frame	1.143	1.617	11,425		Copper	7440-50-8	91.03	
Zinc	7440-66-6	Lead Frame	0.177	0.251	1,774		Silver	7440-22-4	6.30	
Phosphorus	7723-14-0	Lead Frame	0.073	0.103	730		Iron	7439-89-6	2.19	
Silver	7440-22-4	Die Attach	0.963	1.362	9,625		Zinc	7440-66-6	0.34	
Acrylic Resin	Trade secret	Die Attach	0.106	0.150	1,063		Phosphorus	7723-14-0	0.14	
Polybutadiene derivative & copolymer	Trade secret	Die Attach	0.081	0.115	813			Total	100.00	
Acrylate	Trade secret	Die Attach	0.069	0.097	688	1.77	(mg) Total	Die Attach	% of Total Weight	1.25
Epoxy Resin 2	Trade secret	Die Attach	0.031	0.044	313		Silver	7440-22-4	77.00	
Silicon	7440-21-3	Chip (Die)	7.800	11.037	78,000		Acrylic Resin	Trade secret	8.50	
Gold	7440-57-5	Wire Bond	0.040	0.057	400	Polybutadie	ne derivative & copolymer	Trade secret	6.50	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.600	2.264	16,000		Acrylate	Trade secret	5.50	
		TOTALS:	100.000	141.500	1,000,000		Epoxy Resin	Trade secret	2.50	
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 2	g Total Mass 0002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	ctive) and with	EU	11.04	Total (mg)	Total Chip (Die)	100.00 % of Total Weight	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified vi nemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc	mply with EU Directive 2 ia internal design contro mical substance is NOT cument, there is no credi	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concer	to the best of	Microchip Tec	hnology	11.04	Total (mg) Doped Silicon			7.8
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified vi memical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doo is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flar ul.com/global/eng/pages/offerings/industries/chemicals	mply with EU Directive 2 ia internal design contro mical substance is NOT cument, there is no credi regulatory scheme work mmability standard for p /plastics/	1002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concer d-wide. lastics. You can access the UL iQTM family of databases to	to the best of otration of the o	Microchip Tec chemical subs report at	hnology tance, if	0.06	Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	7.8
etive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vi hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flar l/ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shippy	mply with EU Directive 2 ia internal design contro mical substance is NOT cument, there is no credi regulatory scheme work mmability standard for p /plastics/	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concer d-wide.	to the best of otration of the o	Microchip Tec chemical subs report at	hnology tance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	7.8
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vi hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat //ul.com/global/eng/pages/offerings/industries/chemicals orotective "tubes" in which the specific product is shippe in "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information original packing materials is true and correct to the best oleteness and accuracy of data in this form because it hamation is often protected from disclosure as trade secrevoided only as estimates of the average weight of these products in the secret or the se	mply with EU Directive 2 is internal design contro mical substance is NOT zument, there is no credi regulatory scheme work mmability standard for p /plastics/ ed are made from polyvi in this form concerning i of its knowledge and be is been compiled based ts and some information parts and the average w	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic (PVC) plastic. "Window envelopes" used to be substances restricted by RoHS in Microchip Technology In the ranges provided in Material Safety Data Sheets prowing in the ranges provided by subcontract assemblers a elight of anticipated significant toxic metals components. T	to the best of ontration of the coordinates of the	Microchip Tec chemical subs report at slip on the ou emiconductor d cannot guara taterial supplie	ter box and devices in intee the ers. Supplier		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	0.04
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). upliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories and solves the cherporated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any sting compounds used by Microchip meet the UL94 V0 flar. L'/Lul.com/global/eng/pages/offerings/Industries/chemicals protective "tubes" in which the specific product is shipped in "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information or original packing materials is true and correct to the best pleteness and accuracy of data in this form because it hamation is often protected from disclosure as trade secretorided only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained onchip Technology Incorporated does not provide any wait.	mply with EU Directive 2 is internal design contro mical substance is NOT cument, there is no credi regulatory scheme work mmability standard for p /plastics/ ed are made from polyvi in this form concerning s of its knowledge and be its been compiled based ts and some information parts and the average w within silicon devices (s rranty, express or implie	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic (PVC) plastic. "Window envelopes" used to be substances restricted by RoHS in Microchip Technology In the ranges provided in Material Safety Data Sheets prowing in the ranges provided by subcontract assemblers a elight of anticipated significant toxic metals components. T	to the best of tration of the coordinates of the co	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial supplie al suppliers. Ir d o not include sive, limited pr	ter box and devices in intee the irs. Supplier information te trace		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	0.04
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified viemical substance is absent from the list above, the cheorated's knowledge and belief as of the date of this doc not below the threshold of regulatory concern for anying compounds used by Microchip meet the UL94 V0 flar ul.com/global/eng/pages/offerings/industries/chemicals rotective "tubes" in which the specific product is shippen "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information original packing materials is true and correct to the best eteness and accuracy of data in this form because it hat aition is offen protected from disclosure as trade secrevided only as estimates of the average weight of these pof dopants, metals, and non-metal materials contained thip Technology Incorporated does not provide any wanties provided by Microchip Technology Incorporated a cions, sales order acknowledgement, and invoices.	mply with EU Directive 2 is internal design contro mical substance is NOT cument, there is no credi regulatory scheme work mmability standard for p /plastics/ ed are made from polyvi in this form concerning of its knowledge and be is been compiled based its and some information parts and the average w within silicon devices (s rranty, express or implie nd its subsidiaries are c users' reliance on the is	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic (PVC) plastic. "Window envelopes" used to be substances restricted by RoHS in Microchip Technology In slief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets proving in the provided by subcontract assemblers a leight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declarated.	to the best of intration of the of the observation	Microchip Techemical substreport at slip on the outer demiconductor demonst guarataterial supplies. In side not included in Microchemical suppliers, in side not included in Microchemical suppliers of provided in Microchemical substrate in Microchim substrate in Microchemical substrate in Mi	ter box and devices in intee the irs. Supplier iformation ie trace oduct licrochip's	0.06	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.04
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ipliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories with the above EU Directives has been verified victories with the above EU Directives has been verified victories and belief as of the date of this doc is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 flar (//ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shippy ain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information original packing materials is true and correct to the best pleteness and accuracy of data in this form because it hamation is often protected from disclosure as trade secre ovided only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained ochip Technology Incorporated does not provide any war anties provided by Microchip Technology Incorporated a ations, sales order acknowledgement, and invoices.	mply with EU Directive 2 is internal design contro mical substance is NOT cument, there is no credi regulatory scheme work mmability standard for p /plastics/ ed are made from polyvi in this form concerning of its knowledge and be is been compiled based its and some information parts and the average w within silicon devices (s rranty, express or implie nd its subsidiaries are c users' reliance on the is	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Inglief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets proving any not have been provided by subcontract assemblers a eight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declarationtained in Microchip's standard terms and conditions of soft the proposition of the liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages.	to the best of intration of the of the observation	Microchip Techemical substreport at slip on the outer demiconductor demonst guarataterial supplies. In side not included in Microchemical suppliers, in side not included in Microchemical suppliers of provided in Microchemical substrate in Microchim substrate in Microchemical substrate in Mi	ter box and devices in intee the irs. Supplier iformation ie trace oduct licrochip's	0.06	Doped Silicon (mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1. hour	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.04

Q2AE 08 TDFN-S 10:56 AM : 8/29/2013

AICROCHIP Semiconductor Devic	e Type: QAF 08 (Lead) T	TDFN-S 6x5x0.8 mm (9A)		nation Base A pper Alloy (C	•		•	ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	38.79	(mg) Total	Mold Compound	% ot Total Weight	51.17
Silica, vitreous (or fused)	60676-86-0	Mold Compound	43.495	32,969	434.945	30.73	Silica, vitreous (or fused)	60676-86-0	85.00	· · · · · ·
Epoxy Resin	Trade Secret	Mold Compound	4.452	3.374	44.518		Epoxy Resin	Trade Secret	8.70	ł
Phenolic Resin	Trade Secret	Mold Compound Mold Compound	3.070	2.327	30,702		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound Mold Compound	0.154	0.116	1.535		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	37.675	28.557	376,746		Carbon Black	Total	100.00	1
Iron	7439-89-6	Lead Frame	0.891	0.675	8,906	29.35	(mg) Total	Lead Frame	% of Total Weight	
Phosphorous	7723-14-0	Lead Frame	0.097	0.073	968	29.33	Copper	7440-50-8	97.30	30.72
Zinc (Metal)	7440-66-0	Lead Frame	0.058	0.073	581			7440-50-8	2.30	
							Iron			
Silver	7440-22-4	Die Attach	1.051 0.284	0.797 0.215	10,508 2,840		Phosphorous	7723-14-0	0.25	
Epoxy resin	Trade Secret	Die Attach					Zinc (Metal)	7440-66-0	0.15	1
Metal oxide	Trade Secret	Die Attach	0.043	0.032	426			Total	100.00	
Gamma-butyrolactone	96-48-0	Die Attach	0.043	0.032	426	1.08	(mg) Total	Die Attach	% of Total Weight	1.42
Silicon	7440-21-3	Chip (Die)	8.220	6.231	82,200		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.260	0.197	2,600		Epoxy resin	Trade Secret	20	
Nickel	7440-02-0	Plating on external leads (pins)	0.198	0.150	1,985		Metal oxide	Trade Secret	3	
Palladium	7440-05-03	Plating on external leads (pins)	0.011	0.008	105		Gamma-butyrolactone	96-48-0	3]
Gold	7440-57-5	Plating on external leads (pins)	0.001	0.001	11			Total	100.00	
		TOTALS	: 100.000	75.800	1,000,000	6.23	Total (mg)	Chip (Die)	% of Total Weight	8.22
	0.0758 g To	otal Mass					Doped Silicon	7440-21-3	100	
				- 41 \ d d t	. FII			Tatal	100.00	4
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	i/EC (RoHS Directive), EU Directive 2011/65/EU (I	RoHS Recast Dire	ective) and with	n EU	0.20	(mg) Total	Total Wire Bond		
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the proprated's knowledge and belief as of the date of this). d via internal design controls, sup chemical substance is NOT an inte document, there is no credible rea	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor	and, to the best o	f Microchip Te	chnology	0.20	(mg) Total Doped Gold	Total Wire Bond 7440-57-5	% of Total Weight	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the opporated's knowledge and belief as of the date of this , is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0). d via internal design controls, sup chemical substance is NOT an into document, there is no credible rec any regulatory scheme world-wide flammability standard for plastics	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor.	and, to the best o	of Microchip Te	chnology	0.20	. 5,	Wire Bond	% of Total Weight	0.26
). d via internal design controls, sup- chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide flammability standard for plastics als/plastics/	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor You can access the UL iQTM family of database	and, to the best o icentration of the es to obtain a tes	of Microchip Te chemical sub- t report at	chnology stance, if	0.20	. 5,	Wire Bond 7440-57-5	% of Total Weight	0.26
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the proporated's knowledge and belief as of the date of this , is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 pt/lul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is sh	d via internal design controls, sup- chemical substance is NOT an inter- document, there is no credible rea- any regulatory scheme world-wide flammability standard for plastics- cals/plastics/ ipped are made from polyvinyl chloron in this form concerning substa- post of its knowledge and belief, as t has been compiled based on the crets and some information may re- se parts and the average weight to	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor. You can access the UL iQTM family of database oride (PVC) plastic. "Window envelopes" used to nees restricted by RoHS in Microchip Technolog of the date listed in this form. Microchip Technolog so of the date listed in Material Safety Data Sheets not have been provided by subcontract assemble of anticipated significant toxic metals component	and, to the best of icentration of the es to obtain a test o hold the packing y Incorporated's ology Incorporate provided by raw it	of Microchip Te chemical sub- t report at g slip on the o semiconducto d cannot guar material suppli rial suppliers. I	chnology stance, if uter box and or devices in antee the ers. Supplier information		Doped Gold	Wire Bond 7440-57-5 Total Plating on external	% of Total Weight 100 100.00	0.26
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive inpliance with the above EU Directives has been verifie chemical substance is absent from the list above, the orporated's knowledge and belief as of the date of this i, is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 VO:://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shatin "reels" may be made from PVC plastic. rochip Technology Incorporated believes the information criginal packing materials is true and correct to the inpleteness and accuracy of data in this form because i ormation is often protected from disclosure as trade se rovided only as estimates of the average weight of the	d via internal design controls, sup- chemical substance is NOT an internal document, there is no credible rea- any regulatory scheme world-wide flammability standard for plastics- cals/plastics/ ipped are made from polyvinyl chl on in this form concerning substa- best of its knowledge and belief, as t has been compiled based on the crets and some information may re- se parts and the average weight o ned within silicon devices (silicon in warranty, express or implied, with	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor. You can access the UL iQTM family of database oride (PVC) plastic. "Window envelopes" used to move restricted by RoHS in Microchip Technolog of the date listed in this form. Microchip Technolog is of the date listed in this form. Microchip Technolog is of the date listed in Material Safety Data Sheets not have been provided by subcontract assemble of anticipated significant toxic metals component IC) in the finished parts.	and, to the best of icentration of the est to obtain a test of hold the packing y incorporated's plogy incorporate provided by raw it is and raw maters. These estimate aration. The exclusions of the estimate of the estimat	of Microchip Te chemical sub- t report at g slip on the o semiconductored cannot guar material suppli rial suppliers. I ses do not inclu	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace		Doped Gold (mg) Total	Wire Bond 7440-57-5 Total Plating on external leads (pins)	% of Total Weight 100 100.00 % of Total Weight	0.26
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this is, is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 VO dinglobal/eng/pages/offerings/industries/chemic is protective "tubes" in which the specific product is sheatin "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information of the protected from disclosure as trade se intrination is often protected from disclosure as trade se rovided only as estimates of the average weight of the els of dopants, metals, and non-metal materials contain rochip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated on the protected provided only as estimates of the average weight of the els of dopants, metals, and non-metal materials contain rochip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporated does not provide any ranties provided by Microchip	d via internal design controls, sup- chemical substance is NOT an internal decument, there is no credible rea- iny regulatory scheme world-wide flammability standard for plastics- lais/plastics/ ipped are made from polyvinyl chl on in this form concerning substa- best of its knowledge and belief, as- t has been compiled based on the crets and some information may no se parts and the average weight or ned within silicon devices (silicon in warranty, express or implied, with and and its subsidiaries are contained r changes to Material Content Deci the users' reliance on the information	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor. You can access the UL iQTM family of database oride (PVC) plastic. "Window envelopes" used to unces restricted by RoHS in Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form Microchip Technologs in the date listed in this form successful to the seen provided by subcontract assemble of anticipated significant toxic metals component IC) in the finished parts. In respect to the information provided in this decled in Microchip's standard terms and conditions larations and shall not be liable for any damages	and, to the best of icentration of the best to obtain a test of hold the packing y Incorporated's ology Incorporated by raw in a sand raw maters. These estimates aration. The exclusion of sale. These are, direct or indirect	of Microchip Te chemical sub- treport at g slip on the o semiconductor d cannot guar material supplicial suppliers. I so do not inclusive, limited p e provided in let, consequent	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace product Microchip's		Doped Gold (mg) Total Nickel	Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-02-0	% of Total Weight 100 100.00 % of Total Weight 94.50	0.26
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive, inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the opporated's knowledge and belief as of the date of this is, is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 VO:://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shatin "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information of the information is often protected from disclosure as trade se rovided only as estimates of the average weight of the less of dopants, metals, and non-metal materials contain rochip Technology Incorporated does not provide any ranties provided by Microchip Technology Incorporate tations, sales order acknowledgement, and invoices. Technological in any duty to notify users of updates on envise, suffered by users or third parties as a result of the information of the infor	d via internal design controls, sup- chemical substance is NOT an internal decument, there is no credible rea- iny regulatory scheme world-wide flammability standard for plastics- lais/plastics/ ipped are made from polyvinyl chl on in this form concerning substa- best of its knowledge and belief, as- t has been compiled based on the crets and some information may no se parts and the average weight or ned within silicon devices (silicon in warranty, express or implied, with and and its subsidiaries are contained r changes to Material Content Deci the users' reliance on the information	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity cor. You can access the UL iQTM family of database oride (PVC) plastic. "Window envelopes" used to unces restricted by RoHS in Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form. Microchip Technologs of the date listed in this form Microchip Technologs in the date listed in this form successful to the seen provided by subcontract assemble of anticipated significant toxic metals component IC) in the finished parts. In respect to the information provided in this decled in Microchip's standard terms and conditions larations and shall not be liable for any damages	and, to the best of icentration of the best to obtain a test of hold the packing y Incorporated's ology Incorporated by raw in a sand raw maters. These estimates aration. The exclusion of sale. These are, direct or indirect	of Microchip Te chemical sub- treport at g slip on the o semiconductor d cannot guar material supplicial suppliers. I so do not inclusive, limited p e provided in let, consequent	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace product Microchip's		Doped Gold (mg) Total Nickel Palladium	Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-02-0	% of Total Weight 100 100.00 % of Total Weight 94.50	0.26

pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Doped Silicon 7440-21-3 100.00	Semiconductor Device	Type: MN/HC/LC	10 (Lead) TDFN 3x3x0.8mm (QA)		nation Base pper Alloy (0	-			eneous Materials: pc boards, displays)		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Size, winners (or funed)	Basic Substance	CAS Number			mg/part	ppm	12.60	(mg) Total	Mold Compound	% ot Total Weight	60.00
Eprox Rean Trade Secret Mode Compound 3,000 1,000 52,000 Coper Trade Secret 1,00 Promit Rean Trade Secret 1,00 P			•		<u> </u>			Silica, vitreous (or fused)	60676-86-0	85.00	
Cation Block								Epoxy Resin	Trade Secret	8.70	
Copper	Phenolic Resin	Trade Secret	Mold Compound	3.600	0.756	36,000		Phenolic Resin	Trade Secret	6.00	
First	Carbon Black	1333-86-4	Mold Compound	0.180	0.038			Carbon Black	1333-86-4	0.30	
Silver 1446-02-4 Leaf Frame 0.051 0.128 6.098 400 1.000	Copper	7440-50-8	Lead Frame	30.572	6.420	305,720			Total	100.00	•
Prosphorous 1723-14-0 Lead Frame 0,040 0,050 0,050 244 501 504 504 504 504 504 504 504 504 504 504	Iron	7439-89-6	Lead Frame	0.752	0.158	7,520	6.72	(mg) Total	Lead Frame	% of Total Weight	32.00
Proceptorous 1723-14-0 Lead Frame 0.006 0.008 244 Silver 1740-02-4 191 191 201 191 201 191 201 191 201 191 201 191 201 191 201 191 201 201 191 201 201 201 201 201 201 201 201 201 20	Silver	7440-22-4	Lead Frame	0.610	0.128	6,096		Copper	7440-50-8	95.54	
Silver 7440-92-4 De Attach 0.058 0.012 500 500 100 100 100 100 100 100 100 100	Zinc	7440-66-6	Lead Frame	0.040	0.008	400		Iron	7439-89-6	2.35	
Epox Resin 9303-96-5 Die Attach 0.015 0.003 150 Phonotic hardward with a 1016-08-8 Die Attach 0.056 0.005 150 0.000	Phosphorous	7723-14-0	Lead Frame	0.026	0.006	264		Silver	7440-22-4	1.91	
1-Buty pheny dybody either 1924-86 Die Attach 0,000 0,000 2 0,	Silver		Die Attach					Zinc	7440-66-6	0.13	
Phenoic hardener 92-88-6 De Attach 0,000 0	Epoxy Resin	9003-36-5	Die Attach	0.015	0.003	150		Phosphorous	7723-14-0	0.08	
Buth cellosolve acetate 112-07-2 De Attach 0.001 0.000 6 Silocon 7440-21-3 Chp (De) 4.88.00 1.012 4.82.00 Doped Gold 7440-57-5 Wire Bond 7440-57-5 Wire Bond 1.000 1.000 0.001 0.000 1.000 0.000 1.000 0.000 1.000 0.000 1.000 0.000 1.000 0.000 1.000 0.000 0.000 1.000 0.000 1.000 0.000 0.000 1.000 0.000	t-Butyl phenyl glycidyl ether	3101-60-8	Die Attach	0.005	0.001	50		-	Total	100.00	•
Silicon 7440;21:3 Chip (Phip Clash Age) 1,012 48,200 1 1,012 148,200 1 1,000 1 0,021 1,000 1 1	Phenolic hardener	92-88-6	Die Attach	0.000	0.000	2	0.02	(mg) Total	Die Attach	% of Total Weight	0.08
Silicon Poped Gold 7440;21-3 (Phip (Dish Poped Gold Pop	Butyl cellosolve acetate	112-07-2	Die Attach	0.001	0.000	6		Silver	7440-22-4	73.80	
Tin 7440-31-5 Peargo on external leads (pring) - Matter Tin / amenaled ast 150°C (port law 2, 0,000 2,1,000 0 2,1,000 0 1,000,000 1,000,000 1,000,000 1,000,000	Silicon	7440-21-3	Chip (Die)	4.820	1.012	48,200		Epoxy Resin	9003-36-5	18.80	
O.0210 a Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Doped Silicon Total 100.00	Doped Gold	7440-57-5	Wire Bond	0.100	0.021	1,000		t-Butyl phenyl glycidyl ethe	3101-60-8	6.30	
Semiconductor device and its homogenous materials comply with EU Directive 2002/55/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 1.01 (mg] Total Chip (Die) % of Total Weight 4.82 Doped Silcon 7440-21-3 100.00 Doped Silcon 7440-21-3 1	Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.000	0.630	30,000		Phenolic hardener	92-88-6	0.30	
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU 1.01 (mg) Total Chip (Die) % of Total Weight 4.82 1.01 (mg) Total Chip (Die) % of Total Weight 4.82 1.01 (mg) Total Chip (Die) % of Total Weight 4.82 1.02 (mg) Total 100.00 1.02 (mg) Total 100.00 1.03 (mg) Total 100.00 1.04 (mg) Total 100.00 1.04 (mg) Total 100.00 1.04 (mg) Total 100.00 1.05 (mg)			TOTALS:	100.000	21.000	1,000,000		Butyl cellosolve acetate	112-07-2	1	
pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. Doped Silicon 7440-21-3 100.		0.0210	w Total Mass								
prorated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. If ign compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at Viul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain "reels" may be made from PVC plastic. Doped Gold 7440-57-5 100.00 Doped Gold 7440-57-5 100.	semiconductor device and its homogenous materials co			Recast Dire	ctive) and wit	h EU					
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain "reels" may be made from PVC plastic. Doped Gold T440-57-5 100.00	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 20	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS	Recast Dire	ctive) and wit	h EU	1.01		Chip (Die)	% of Total Weight	4.82
pochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices eir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Indication is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Indication is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not detrace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Total 100.00 Plating on external leads (pins) - Matter Tin / annealed at 150°C for 1 hour Provise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00 7440-31-5 100.00	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified v hemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this do	emply with EU Directive 20 ia internal design controls emical substance is NOT ar cument, there is no credibl	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	to the best of	Microchip Te	echnology	1.01		Chip (Die) 7440-21-3	% of Total Weight	4.82
pechip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices elier original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Material suppliers. The provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not deterace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. The provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product antices provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's along, sales order acknowledgement, and invoices. The provided of the users' reliance on the information in Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) The provided semiconductor products.	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified v hemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 fla	omply with EU Directive 200 ia internal design controls rmical substance is NOT ar cument, there is no credibl regulatory scheme world- mmability standard for pla	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concentivide.	to the best of tration of the	Microchip Te chemical sub	echnology		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
anties provided by Microchip Technology Incorporated and warranty, expises of implied, with respect to the information provided in Mis exclusive, initiate product and warranty, expises of implied, with respect to the information in Microchip's anties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's annealed at 150°C for 1 when the product of the provided at 150°C for 1 when the provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's when the product of the provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's when the provided in Microchip's when the product of the provided in Microchip's when the provided in Microchip's when the product of the provided in Microchip's when the product of the provided in Microchip's when the provided in Microchip's w	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). upliance with the above EU Directives has been verified vehemical substance is absent from the list above, the che riporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 flact/lul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp	emply with EU Directive 200 ia internal design controls emical substance is NOT ar cument, there is no credibl regulatory scheme world- mmability standard for pla s/plastics/	o2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concentivide. Institute: You can access the UL IQTM family of databases to	to the best of tration of the obtain a test	Microchip Te chemical sub report at	echnology estance, if		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00 (this Certificate of Compliance for semiconductor products.	ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified vehicles with the above EU Directives has been verified vehicles as the substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 flats: In protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. In protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. In protective the beautiful protected from disclosure as transition is often protected from disclosure as transition is provided only as estimates of the average weight information is provided only as estimates of the average weight information is provided only as estimates of the average weight information is provided only as estimates of the average weight information is provided only as estimates of the average weight information is provided only as estimates of the average weight information is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as estimates of the average weight in the formation is provided only as a	ia internal design controls in internal design controls in internal design controls in internal substance is NOT are cument, there is no credibly regulatory scheme world-immability standard for playlplastics/ ed are made from polyviny in this form concerning suest of its knowledge and but has been compiled base ade secrets and some infound the experts and the expe	o2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concernide. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concernide. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concernide. In intentional ingredient in intentional	to the best of tration of the obtain a test of the packing corporated's ggy Incorpora rovided by ra mblers and ra	Microchip Te chemical sub report at g slip on the c semiconduct tted cannot gi w material su w material su	echnology stance, if outer box or devices uarantee uppliers.		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
Total 100.00	ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified vehicles with the above EU Directives has been verified vehicles as the state of the date of this do is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 flath. Which was the secific product is shipp certain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information neir original packing materials is true and correct to the becompleteness and accuracy of data in this form because piler information is often protected from disclosure as transation is provided only as estimates of the average weigude trace levels of dopants, metals, and non-metal materiorochip Technology Incorporated does not provide any was recorded and the provided and the pr	ia internal design controls in internal design controls in internal design controls in internal substance is NOT are cument, there is no credibly regulatory scheme world-immability standard for playlplastics/ ed are made from polyviny in this form concerning suest of its knowledge and but has been compiled base add secrets and some infor ght of these parts and the allals contained within silicourranty, express or implied,	oz/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concern wide. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concern wide. In intentional ingredient in the unavoidable impurity concern wide. It chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology Intellief, as of the date listed in this form. Microchip Technolog of on the ranges provided in Material Safety Data Sheets promation may not have been provided by subcontract assertances average weight of anticipated significant toxic metals comin devices (silicon IC) in the finished parts.	to the best of tration of the obtain a test of the packing corporated's ogy Incorporarovided by ramblers and raponents. The	Microchip Te chemical sub- report at g slip on the c semiconduct ated cannot give material su aw material su ase estimates	puter box or devices uarantee ippliers. do not	0.02	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.10
	tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Dilance with the above EU Directives has been verified venemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do snot below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flavul.com/global/eng/pages/offerings/Industries/chemicals protective "tubes" in which the specific product is shipp pertain "reels" may be made from PVC plastic. In the product of the propension of the protected from disclosure as transition is often protected from disclosure as transition is provided only as estimates of the average weigher trace levels of dopants, metals, and non-metal materiochip Technology Incorporated does not provide any was unties provided by Microchip Technology Incorporated at a tions, sales order acknowledgement, and invoices.	ia internal design controls in internal design controls in internal design controls in internal substance is NOT are cument, there is no credibly regulatory scheme world-internal internal inte	oz/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concentivide. In the constant of the constant	to the best of tration of the obtain a test of the packing corporated's gy Incorporar rovided by ramblers and raponents. The excludale. These are	Microchip Te chemical sub- report at g slip on the consequence to the connection of	echnology istance, if butter box or devices uarantee uppliers. do not boroduct Microchip's	0.02	Doped Silicon (mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00 % of Total Weight	0.10

MN_HC_LC 10-TDFN 10:57 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: MUY 08 (Lead)	UDEN 2-2-0 5mm (6O)		nation Base A				ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Semiconductor Device	Type: IVIOT US (Lead)	"Contained In"					,		Ī	64
Basic Substance	CAS Number	Sub-Component	% Total Weight	mg/part	ppm	5.37	(mg) Total	Mold Compound	% ot Total Weight	67.95
Silica, fused	60676-86-0	Mold Compound	61.155	4.831	611.550	1	Silica, fused	60676-86-0	90.00	1
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	3,296	0.260	32,956	Fpoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.296	0.260	32,956	_,,	Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.204	0.016	2,039		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	20.779	1.642	207,786	1 '		Total	100.00	ч
Tin	7440-31-5	Lead Frame	0.053	0.004	533	1.69	(mg) Total	Lead Frame	% of Total Weight	21.33
Silver	7440-22-4	Lead Frame	0.406	0.032	4.063		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.038	0.003	384	1	Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.053	0.004	533		Silver	7440-22-4	1.91	1
Silver	7440-22-4	Die Attach	1.911	0.151	19,110	1	Zinc	7440-66-6	0.18	1
Acrylate resins Proprietary	Trade Secret	Die Attach	0.441	0.035	4,410	1	Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.049	0.004	490	1 '		Total	100.00	а
Heterocyclic organic compound	Trade Secret	Die Attach	0.049	0.004	490	0.19	(mg) Total	Die Attach	% of Total Weight	2.45
Silicon	7440-21-3	Chip (Die)	7.350	0.581	73,500		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.750	0.059	7.500		Acrylate resins Proprietary	Trade Secret	18	1
Nickel	7440-02-0	Plating on external leads (pins)	0.163	0.013	1,627	i i	Treated silica	Trade Secret	2	
Palladium	7440-05-03	Plating on external leads (pins)	0.005	0.000	55	Hetero	ocyclic organic compound	Trade Secret	2	
JGPSSI (D02) (Gold)	7440-57-5	Plating on external leads (pins)	0.002	0.000	18	1	,	Total	100.00	U
001 001 (B02) (O010)	7440 07 0	TOT.		7.900	1.000.000	0.58	Total (mg)	Chip (Die)	% of Total Weight	7.35
	0.0070 T		100.000	7.500	1,000,000	0.30	Doped Silicon	7440-21-3	100	1.55
	0.0079 g To	otai wass								
s semiconductor device and its homogenous materials co	omply with EU Directive 2002/95	5/EC (RoHS Directive), EU Directive 2011/65/EU	(RoHS Recast Directive)	and with EU	Directive		Dopod Cilicon	Total		Ш
02/53/EC (End-of-Life Vehicles (ELV) Directive).		, , ,	(RoHS Recast Directive)	and with EU [Directive	0.06		Total	100.00	0.75
n2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified vertices in the composition of the comp	via internal design controls, sup emical substance is NOT an into coument, there is no credible rea y scheme world-wide.	oplier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity c	and, to the best of Micro	ochip Technol ical substance	logy	0.06	(mg) Total Doped Gold	Total Wire Bond 7440-57-5	% of Total Weight	0.75
n2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified vant chemical substance is absent from the list above, the cheoroprated's knowledge and belief as of the date of this do low the threshold of regulatory concern for any regulatory belding compounds used by Microchip meet the UL94 V0 flate.	via internal design controls, sup emical substance is NOT an into ocument, there is no credible rea or scheme world-wide.	oplier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity c	and, to the best of Micro	ochip Technol ical substance	logy	0.06	(mg) Total	Total Wire Bond	% of Total Weight	0.75
02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified was chemical substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this do low the threshold of regulatory concern for any regulatory olding compounds used by Microchip meet the UL94 V0 flapp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shipp	via internal design controls, sup emical substance is NOT an into ocument, there is no credible re- scheme world-wide. ammability standard for plastics s/plastics/	pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity c s. You can access the UL iQTM family of databa	and, to the best of Micro oncentration of the chem ses to obtain a test repo	ochip Technol ical substance rt at	logy e, if any, is not	0.06	(mg) Total	Total Wire Bond 7440-57-5	% of Total Weight	0.75
02/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified was chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this do low the threshold of regulatory concern for any regulatory olding compounds used by Microchip meet the UL94 V0 file tp://ul.com/global/eng/pages/offerings/industries/chemicals are protective "tubes" in which the specific product is shippels" may be made from PVC plastic. ccrochip Technology Incorporated believes the information iginal packing materials is true and correct to the best of it d accuracy of data in this form because it has been compioned to the desired from disclosure as trade secrets and some inform the average weight of these parts and the average weight	via internal design controls, sup- emical substance is NOT an into- comment, there is no credible re- ry scheme world-wide. ammability standard for plastics s/plastics/ ped are made from polyvinyl chi an in this form concerning substa- ts knowledge and belief, as of the iled based on the ranges provide ation may not have been provide of anticipated significant toxic in	pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity c s. You can access the UL iQTM family of databatoride (PVC) plastic. "Window envelopes" used unces restricted by RoHS in Microchip Technolo he date listed in this form. Microchip Technolo he date listed in this form. Microchip Technolo he date listed to the semblers and raw materia ed by subcontract assemblers and raw materia	and, to the best of Microncentration of the chemses to obtain a test report to hold the packing slip begy incorporated cannot gaw material suppliers. Sits uppliers. Information it	ochip Technol ical substance rt at on the outer b conductor dev uarantee the c upplier inform s provided on	logy e, if any, is not nox and certain rices in their completeness ation is often ly as estimates		(mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external	100.00 % of Total Weight 100 100.00	
ais semiconductor device and its homogenous materials on 20/253/EC (End-of-Life Vehicles (ELV) Directive). Dempliance with the above EU Directives has been verified value a chemical substance is absent from the list above, the characteristic way and the substance of the date of this does allow the threshold of regulatory concern for any regulatory colding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemicals are protective "tubes" in which the specific product is shippeles" may be made from PVC plastic. Cicrochip Technology Incorporated believes the information iginal packing materials is true and correct to the best of it id accuracy of data in this form because it has been compiled to the development of the average weight of these parts and the average weight aterials contained within silicon devices (silicon IC) in the incrochip Technology Incorporated does not provide any we ovided by Microchip Technology Incorporated and its subsider acknowledgement, and invoices.	via internal design controls, sup- emical substance is NOT an into- comment, there is no credible re- r scheme world-wide. ammability standard for plastics s/plastics/ ped are made from polyvinyl chl n in this form concerning substa- ts knowledge and belief, as of the lied based on the ranges provid of anticipated significant toxic of finished parts. arranty, express or implied, with	pplier declarations, and /or analytical test data. entional ingredient in the semiconductor devices to believe that the unavoidable impurity constructions. You can access the UL iQTM family of databastoride (PVC) plastic. "Window envelopes" used unces restricted by RoHS in Microchip Technologed in Material Safety Data Sheets provided by led by subcontract assemblers and raw materials components. These estimates do not in	and, to the best of Microncentration of the chemses to obtain a test report to hold the packing slip bogy Incorporated's semicy Incorporated cannot graw material suppliers. Si I suppliers. Information is clude trace levels of dop:	ochip Technol ical substance rt at on the outer b conductor dev uarantee the c upplier inform s provided on ants, metals, a	logy e, if any, is not oox and certain rices in their completeness ation is often ly as estimates and non-metal		(mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100.00 % of Total Weight 100 100.00 % of Total Weight	
napliance with the above EU Directive). Impliance with the above EU Directives has been verified were comporated in the above EU Directives has been verified were comporated in the above EU Directives has been verified were comporated in the above the characteristic form. It is above, the characteristic form the list above, the characteristic form the above the threshold of regulatory concern for any regulatory biding compounds used by Microchip meet the UL94 V0 flap; p://ul.com/global/eng/pages/offerings/industries/chemicals are protective "tubes" in which the specific product is shippels may be made from PVC plastic. crochip Technology Incorporated believes the information ginal packing materials is true and correct to the best of it accuracy of data in this form because it has been compicated from disclosure as trade secrets and some informathe average weight of these parts and the average weight terials contained within silicon devices (silicon IC) in the decreption of the corporated does not provide any was provided by Microchip Technology Incorporated does not provide any was provided by Microchip Technology Incorporated and its substituted.	via internal design controls, supemical substance is NOT an intocument, there is no credible receivable. Some world-wide. An immability standard for plastics s/plastics/ ped are made from polyvinyl chloring in this form concerning substats knowledge and belief, as of tilled based on the ranges providation may not have been provid of anticipated significant toxic if finished parts. arranty, express or implied, with sidiaries are contained in Microhanges to Material Content Dechanges to Material Content Dechange	pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device ason to believe that the unavoidable impurity c s. You can access the UL iQTM family of databatoride (PVC) plastic. "Window envelopes" used unces restricted by RoHS in Microchip Technolo he date listed in this form. Microchip Technolo he date listed in this form. Microchip Technolo he date listed in this form. Microchip Technolo he date listed on this form the semiconduction of the components. These estimates do not in he respect to the information provided in this de chip's standard terms and conditions of sale. Teleprocess.	and, to the best of Microncentration of the chemses to obtain a test report to hold the packing slip bogy Incorporated's seminy Incorporated cannot gaw material suppliers. Si I suppliers. Information i clude trace levels of dopical caration. The exclusive, hese are provided in Micros, direct or indirect, con	ochip Technol ical substance rt at on the outer b conductor dev uarantee the c upplier inform s provided on ants, metals, a limited produc crochip's quot sequential or	logy e, if any, is not fox and certain fices in their completeness and non-metal ct warranties ations, sales otherwise,		(mg) Total Doped Gold (mg) Total Nickel	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-02-0	100.00 % of Total Weight 100 100.00 % of Total Weight 95.73	

MUY 08 UDFN 10:57 AM : 8/29/2013

MICROCHIP Samiconductor Davice	Type: PH 144 (Lead) LQF	D 20/20/4 from (UE)		nation Base A pper Alloy (C	. ,			ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total	Ι		439.61	(mg) Total	Mold Compound	% ot Total Weight	68.23
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm		, 0,	•	ū	1
Silica, vitreous (or fused) Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	57.996 5.936	373.665 38.246	579,955 59.360		Silica, vitreous (or fused)	60676-86-0	85.00 8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.094	26.376	40.938		Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.205	1.319	2,047		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	26.955	173.669	269.547		Calboli black	Total	100.00	<u> </u>
Tin	7440-30-6	Lead Frame	0.069	0.446	692	178.28	(mm) Tatal			
IIII	7440-31-5	Lead Flame	0.069	0.446	692	178.28	(mg) Total	Lead Frame	% of Total Weight	27.67
Silver	7440-22-4	Lead Frame	0.527	3.396	5.271		0	7440 50 0	07.40	
Zinc		Lead Frame	0.527		5,271 498		Copper	7440-50-8 7440-31-5	97.42	
Zinc Chromium	7440-66-6 7440-47-3	Lead Frame Lead Frame	0.050	0.321	498 692		Tin Silver	7440-31-5 7440-22-4	0.25 1.91	1
			0.069	2.300	3.570					1
Silver Epoxy resin	7440-22-4 Trade Secret	Die Attach Die Attach	0.357	2.300 0.657	1.020		Zinc Chromium	7440-66-6 7440-47-3	0.18	
					510		Chromium		*	<u>]</u>
Aliphatic acid anhydride / TPU-ALET	Trade Secret	Die Attach	0.051	0.329				Total	100.00	
Silicon	7440-21-3	Chip (Die)	2.090	13.466	20,900	3.29	(mg) Total	Die Attach	% of Total Weight	0.51
Gold	7440-57-5	Wire Bond	0.280	1.804	2,800		Silver	7440-22-4	70	
Tin	7440-31-5 Plating of	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.220	7.860	12,200		Epoxy resin	Trade Secret	20	
		TOTALS:	100.000	644.300	1,000,000	Aliphatic a	acid anhydride / TPU-ALET	Trade Secret	10	<u>]</u>
	0.6443 g Tot	al Mass						Total	100.00	
his semiconductor device and its homogenous materials co irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with 20 Directive 2002/30/1	EC (KOHS Directive), EO Directive 201 1/05/EO (KOF	HS Recast Dire	ctive) and with	EU	13.47	Total (mg)	Chip (Die)	% of Total Weight	2.09
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi	ia internal design controls, supp	lier declarations, and /or analytical test data.		ŕ		13.47	Total (mg) Doped Silicon	7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	ia internal design controls, supp emical substance is NOT an inter cument, there is no credible reas	lier declarations, and /or analytical test data.	I, to the best of	· Microchip Ted	hnology	13.47		,		
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this dor	ia internal design controls, supp emical substance is NOT an inter cument, there is no credible reas regulatory scheme world-wide. mmability standard for plastics.	elier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce	I, to the best of	Microchip Teo chemical subs	hnology	13.47		7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che acorporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flai	ia internal design controls, supp emical substance is NOT an inter cument, there is no credible reas regulatory scheme world-wide. mmability standard for plastics.	ilier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce	I, to the best of intration of the to obtain a test	Microchip Tec chemical subs	chnology tance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.28
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the che acorporated's knowledge and belief as of the date of this doing, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shipp	ia internal design controls, suppermical substance is NOT an intercument, there is no credible reas regulatory scheme world-wide. Immability standard for plastics. In plastics/ In this form concerning substant of its knowledge and belief, as as been compiled based on the rets and some information may no parts and the average weight of	dier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce You can access the UL iQTM family of databases to the control of the databases. "Window envelopes" used to have seen the control of the date listed in this form. Microchip Technolo anges provided in Material Safety Data Sheets pro thave been provided by subcontract assemblers anticipated significant toxic metals components.	d, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate wided by raw in and raw mater	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie	ter box and devices in intee the ers. Supplier formation		Doped Silicon (mg) Total	7440-21-3 Total	100 100.00 % of Total Weight	0.28
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the che acorporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any loiding compounds used by Microchip meet the UL94 V0 flat ttp://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information neir original packing materials is true and correct to the best ompleteness and accuracy of data in this form because it he formation is often protected from disclosure as trade secreprovided only as estimates of the average weight of these	ia internal design controls, suppermical substance is NOT an intercument, there is no credible reas regulatory scheme world-wide. Immability standard for plastics. s/plastics/ In this form concerning substant of its knowledge and belief, as as been compiled based on the rist and some information may no parts and the average weight of l within silicon devices (silicon IC trranty, express or implied, with a recombined substant of the silicon devices (silicon IC).	dier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce You can access the UL iQTM family of databases in the control of the databases. Window envelopes used to have been the control of the database in this form. Microchip Technology is of the database in this form. Microchip Technology is of the database in this form. Microchip Technology is of the database in this form. Microchip Technology is of the database in this form. Microchip Technology is thave been provided by subcontract assemblers anticipated significant toxic metals components. To in the finished parts.	i, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw in and raw mater These estimate tion. The exclution of the state of the stat	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie all suppliers. Ir s do not include sive, limited pr	ter box and devices in untee the ers. Supplier formation e trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.28
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che icorporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flat ttp://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shippe retain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information eier original packing materials is true and correct to the best ompleteness and accuracy of data in this form because it he formation is often protected from disclosure as trade secre is provided only as estimates of the average weight of these is revels of dopants, metals, and non-metal materials contained licrochip Technology Incorporated does not provide any wa arranties provided by Microchip Technology Incorporated a	ia internal design controls, suppermical substance is NOT an intercument, there is no credible reas regulatory scheme world-wide. Immability standard for plastics. s/plastics/ I ed are made from polyvinyl chlow in this form concerning substant of its knowledge and belief, as as been compiled based on the rests and some information may no parts and the average weight of within silicon devices (silicon IC irranty, express or implied, with in and its subsidiaries are contained to the event of the contained of th	ilier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce You can access the UL iQTM family of databases to ride (PVC) plastic. "Window envelopes" used to have been provided in Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In other than the seminary of the	d, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate vided by raw mand raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara- naterial supplie ial suppliers. Ir s do not include sive, limited pr e provided in N	ter box and devices in intee the ters. Supplier formation le trace	1.80	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100	0.28
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flat ttp://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information neir original packing materials is true and correct to the best ompleteness and accuracy of data in this form because it has formation is often protected from disclosure as trade secres provided only as estimates of the average weight of these evels of dopants, metals, and non-metal materials contained licrochip Technology Incorporated does not provide any wa arranties provided by Microchip Technology Incorporated a uotations, sales order acknowledgement, and invoices. Licrochip disclaims any duty to notify users of updates or chetherwise, suffered by users or third parties as a result of the	ia internal design controls, suppermical substance is NOT an intercument, there is no credible reas regulatory scheme world-wide. Immability standard for plastics. s/plastics/ I ed are made from polyvinyl chlow in this form concerning substant of its knowledge and belief, as as been compiled based on the rests and some information may no parts and the average weight of within silicon devices (silicon IC irranty, express or implied, with in and its subsidiaries are contained to the event of the contained of th	ilier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce You can access the UL iQTM family of databases to ride (PVC) plastic. "Window envelopes" used to have been provided in Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In of the date listed in this form. Microchip Technology In other than the seminary of the	d, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate vided by raw mand raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara- naterial supplie ial suppliers. Ir s do not include sive, limited pr e provided in N	ter box and devices in intee the ters. Supplier formation le trace	1.80	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1. hour	100 100.00 % of Total Weight 100 100.00	1.22

PH 144 LQFP 10:57 AM : 8/29/2013

MICROCHIP Control of the Boot	T 400 LOED			nation Base A			Package Homo	geneous Materials		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Devi	ce Type: 100 LQFP 14	` '								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	348.46	(mg) Total	Mold Compound	% ot Total Weight	71.68
Silica, vitreous (or fused)	60676-86-0	Mold Compound	60.928	296.189	609,280		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	6.236	30.316	62,362		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.301	20.907	43,008		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.215	1.045	2,150		Carbon Black	1333-86-4	0.30	1
Copper	7440-50-8	Lead Frame	23.626	114.855	236,264			Total	100.00	
Iron	7439-89-6	Lead Frame	0.581	2.825	5,812	120.22	(mg) Total	Lead Frame	% of Total Weight	24.73
Silver	7440-22-4	Lead Frame	0.471	2.290	4,711		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.031	0.150	309		Iron	7439-89-6	2.35	4
Phosphorous Silver (Ag)	7723-14-0 7440-22-4	Lead Frame Die Attach	0.020	0.099 1.614	204 3,320		Silver Zinc	7440-22-4 7440-66-6	1.91 0.13	
ANHYDRIDE	Trade Secret	Die Attach	0.036	0.175	360		Phosphorous	7723-14-0	0.13	1
EPOXY RESIN	Trade Secret	Die Attach	0.032	0.175	320		Filospilolous	Total	100.00	
Silicon	7440-21-3	Chip (Die)	1.640	7.973	16,400	1.94	(mg) Total	Die Attach	% of Total Weight	
Doped Gold	7440-57-5	Wire Bond	0.430	2.090	4.300	1.94	Silver (Ag)	7440-22-4	83.00	0.4
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.120	5.445	11.200		ANHYDRIDE	Trade Secret	9.00	
1111	7440010	TOTALS:	100.000	486.130	1.000.000		EPOXY RESIN	Trade Secret	8.00	
	0.4961	g Total Mass			1,000,000		El OXI REGII	Total	100.00	4
					-	7.97	Total (mg)	Chip (Die)	% of Total Weight	1.64
	chemical substance is NOT a document, there is no credib	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent					Doped Silicon	7440-21-3 Total	100 100.00]
f a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any r	chemical substance is NOT a s document, there is no credib regulatory scheme world-wide O flammability standard for pla	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent	ration of the o	chemical subs		2.09	- · · ·	7440-21-3	100	
of a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any removed the compounds used by Microchip meet the UL94 Vittp://ul.com/global/eng/pages/offerings/industries/chemi	chemical substance is NOT a document, there is no credib egulatory scheme world-wide of flammability standard for pla icals/plastics/	ntentional ingredient in the semiconductor device and, to le reason to believe that the unavoidable impurity concent be.	ration of the o	chemical subs	tance, if any,		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.43
if a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any removed in the conference of the co	chemical substance is NOT as a document, there is no credib regulatory scheme world-wide of flammability standard for plactals/plastics/ hipped are made from polyvin tion in this form concerning subset of its knowledge and belie it has been compiled based ocrets and some information is parts and the average weigh	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent is astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Interfaces of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are tof anticipated significant toxic metals components. Thes	obtain a test of the coordinate of the packing corporated's solution in the coordinate of the coordina	chemical substreport at slip on the outer slip o	tance, if any, ter box and r devices in ntee the rs. Supplier formation is		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.43
of a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any removed in the context of the date of this is not below the threshold of regulatory concern for any removed in the context of the date of the UL94 Vittp://ul.com/global/eng/pages/offerings/industries/chemi/The protective "tubes" in which the specific product is stocrtain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informative in their original packing materials is true and correct to the incompleteness and accuracy of data in this form because information is often protected from disclosure as trades forovided only as estimates of the average weight of these of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any	chemical substance is NOT as a document, there is no credib regulatory scheme world-wide to flammability standard for plactals/plastics/nipped are made from polyvin tion in this form concerning subset of its knowledge and belie it has been compiled based o ecrets and some information a parts and the average weigh tithin silicon devices (silicon Korrents).	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent is astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Interfaces of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are tof anticipated significant toxic metals components. Thes	obtain a test of the coordinate of the packing corporated's solution in the coordinate of the coordina	chemical substreport at slip on the outerionductor cannot guaraterial supplies al suppliers. In onot include the sive, limited preserved.	tance, if any, ter box and r devices in ntee the rs. Supplier formation is rrace levels		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.43
if a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any romotion of the content of	chemical substance is NOT as a document, there is no credib regulatory scheme world-wide to flammability standard for plactals/plastics/ hipped are made from polyvin tion in this form concerning subset of its knowledge and belie it has been compiled based ocrets and some information is parts and the average weigh ithin silicon devices (silicon IC) warranty, express or implied ed and its subsidiaries are coor changes to Material Contement the users' reliance on the information on the information or changes to Material Contement the users' reliance on the information or the subsets' reliance on the information or changes to Material Contement the users' reliance on the information or changes to Material Contement the users' reliance on the information or changes to material contements.	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent is astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol ubstances restricted by RoHS in Microchip Technology Interface of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are to fanticipated significant toxic metals components. Thes C) in the finished parts.	obtain a test of the coordinate of the packing corporated is a lincorporated ded by raw mile e estimates do no. The exclusible. These are sect or indirect,	chemical substreport at slip on the outerior decision of the outerior d	ter box and r devices in ntee the rs. Supplier iformation is trace levels oduct icrochip's	2.09	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 7440-31-5	100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	: 0.43
f a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any removed in the content of the date of this is not below the threshold of regulatory concern for any removed in the content of the date of the date of the date of the content of t	chemical substance is NOT as a document, there is no credib regulatory scheme world-wide to flammability standard for plactals/plastics/ hipped are made from polyvin tion in this form concerning subset of its knowledge and belie it has been compiled based ocrets and some information is parts and the average weigh ithin silicon devices (silicon IC) warranty, express or implied ed and its subsidiaries are coor changes to Material Contement the users' reliance on the information on the information or changes to Material Contement the users' reliance on the information or the subsets' reliance on the information or changes to Material Contement the users' reliance on the information or changes to Material Contement the users' reliance on the information or changes to material contements.	n intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concent is astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Interface of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets providing yout have been provided by subcontract assemblers are to fanticipated significant toxic metals components. Theselp in the finished parts. I, with respect to the information provided in this declarationtained in Microchip's standard terms and conditions of so to be a support of the provided of the substantial of the support of the provided in Microchip's standard terms and conditions of so to be clarations and shall not be liable for any damages, direct to be a support of the provided of the provided of the provided in this declaration that is the provided in this declaration that is the provided of the provided in this declaration that is the provided in the provide	obtain a test of the coordinate of the packing corporated is a lincorporated ded by raw mile e estimates do no. The exclusible. These are sect or indirect,	chemical substreport at slip on the outerior decision of the outerior d	ter box and r devices in ntee the rs. Supplier iformation is trace levels oduct icrochip's	2.09	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	: 0.43

TQE3 10:57 AM : 8/29/2013

Halogen-Free

MICROCHIP Somice and under Double	Times DO 44	MOFP		nation Base A	•		•	nogeneous Materials e.g. pc boards, displ		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Devic	e Type: PQ 44 (Lead) N									e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	314.89	(mg) Total	Mold Compound	% ot Total Weight	64.87
Silica, vitreous (or fused)	60676-86-0	Mold Compound	55.140	267.653	551,395		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	5.644	27.395	56,437		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	3.892	18.893	38,922		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.195	0.945	1,946		Carbon Black	1333-86-4	0.30	<u>]</u>
Copper	7440-50-8	Lead Frame	27.106	131.573	271,056			Total	100.00	<u></u>
Nickel	7440-02-0	Lead Frame	0.723	3.509	7,229	138.15	(mg) Total	Lead Frame	% of Total Weight	28.46
Silver	7440-22-4	Lead Frame	0.475	2.306	4,750		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.128	0.622	1,281		Nickel	7440-02-0	2.54	
Magnesium	7439-95-4	Lead Frame	0.028	0.138	285		Silver	7440-22-4	1.67	
Silver (Ag)	7440-22-4	Die Attach	0.556	2.699	5,561		Silicon	7440-21-3	0.45	
ANHYDRIDE	Trade Secret	Die Attach	0.060	0.293	603		Magnesium	7439-95-4	0.10	
EPOXY RESIN	Trade Secret	Die Attach	0.054	0.260	536			Total	100.00	<u></u>
Silicon	7440-21-3	Chip (Die)	3.970	19.271	39,700	3.25	(mg) Total	Die Attach	% of Total Weight	0.67
Gold	7440-57-5	Wire Bond	0.210	1.019	2,100		Silver (Ag)	7440-22-4	83	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.820	8.834	18,200		ANHYDRIDE	Trade Secret	9	
		TOTALS:	100.000	485.410	1,000,000	1	EPOXY RESIN	Trade Secret	8	
	0.4854	g Total Mass				·		Total	100.00	=
This semiconductor device and its homogenous materials			ns Recast Dire	ctive) and with	EU					
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c Incorporated's knowledge and belief as of the date of this	d via internal design control chemical substance is NOT a document, there is no credi	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	d, to the best of	, f Microchip Te	chnology	19.27	Total (mg) Doped Silicon	7440-21-3 Total	% of Total Weight 100 100.00	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c	d via internal design control chemical substance is NOT a document, there is no credit on regulatory scheme world flammability standard for pl	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide.	d, to the best of entration of the	f Microchip Te chemical sub	chnology	1.02	(3)	7440-21-3	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the continuous Incorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 VO	d via internal design control chemical substance is NOT : document, there is no credi iny regulatory scheme world flammability standard for plassics/	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. astics. You can access the UL iQTM family of databases	d, to the best of entration of the to obtain a test	f Microchip Te chemical sub report at	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the of Incorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi	d via internal design control chemical substance is NOT a document, there is no credi any regulatory scheme world flammability standard for plass/plastics/ ipped are made from polyviron in this form concerning sest of its knowledge and be thas been compiled based treats and some information parts and the average weigl	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technoloon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ht of anticipated significant toxic metals components. Th	d, to the best of entration of the to obtain a test old the packing incorporated's gy incorporate wided by raw rand raw materi	f Microchip Te chemical sub report at g slip on the or semiconducto d cannot guar naterial supplies. In	chnology stance, if uter box and r devices in antee the ers. Supplier tformation is		Doped Silicon (mg) Total	7440-21-3 Total	100 100.00 % of Total Weight	0.21
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatit their original packing materials is true and correct to the b completeness and accuracy of data in this form because it information is often protected from disclosure as trade sec provided only as estimates of the average weight of these	d via internal design control chemical substance is NOT in document, there is no crediting regulatory scheme world flammability standard for placials/plastics/ ipped are made from polyviron in this form concerning select of its knowledge and be that has been compiled based crets and some information parts and the average weigh in silicon devices (silicon lewarranty, express or implied warranty, express or implied	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technoloon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers the of anticipated significant toxic metals components. The C) in the finished parts. d, with respect to the information provided in this declaration.	d, to the best of entration of the to obtain a test old the packing incorporated's gy incorporate ovided by raw rand raw materiese estimates outlook.	f Microchip Te chemical sub report at g slip on the or semiconducto d cannot guar naterial suppli ial suppliers. In do not include	chnology stance, if atter box and r devices in antee the ers. Supplier information is trace levels		Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.21
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 Vohttp://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shicertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the becompleteness and accuracy of data in this form because it information is often protected from disclosure as trade see provided only as estimates of the average weight of these of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate	d via internal design control chemical substance is NOT : document, there is no credi into regulatory scheme world flammability standard for pleas/plastics/ ipped are made from polyvir on in this form concerning select of its knowledge and be that has been compiled based crets and some information parts and the average weigh in silicon devices (silicon lewarranty, express or implied and its subsidiaries are conchanges to Material Conterthe users' reliance on the in	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children in the substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers but of anticipated significant toxic metals components. The C) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, data to the same that the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions are same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages.	d, to the best of entration of the to obtain a test old the packing incorporated's gy incorporate ovided by raw rand raw materiese estimates of atton. The exclution. The exclution incorporate are interest or indirect	f Microchip Te chemical sub report at g slip on the or semiconducto d cannot guar naterial suppli ial suppliers. It do not include sieve, limited p e provided in ft, consequentit,	chnology stance, if iter box and r devices in antee the ers. Supplier formation is trace levels roduct ficrochip's al or	1.02	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100	0.21
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shibertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatic their original packing materials is true and correct to the beompleteness and accuracy of data in this form because information is often protected from disclosure as trade sectorovided only as estimates of the average weight of these of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or otherwise, suffered by users or third parties as a result of	d via internal design control chemical substance is NOT : document, there is no credi into regulatory scheme world flammability standard for pleas/plastics/ ipped are made from polyvir on in this form concerning select of its knowledge and be that has been compiled based crets and some information parts and the average weigh in silicon devices (silicon lewarranty, express or implied and its subsidiaries are conchanges to Material Conterthe users' reliance on the in	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children in the substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers but of anticipated significant toxic metals components. The C) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, data to the same that the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions are same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages, data the same conditions and shall not be liable for any damages.	d, to the best of entration of the to obtain a test old the packing incorporated's gy incorporate ovided by raw rand raw materiese estimates of atton. The exclution. The exclution incorporate are interest or indirect	f Microchip Te chemical sub report at g slip on the or semiconducto d cannot guar naterial suppli ial suppliers. It do not include sieve, limited p e provided in ft, consequentit,	chnology stance, if iter box and r devices in antee the ers. Supplier formation is trace levels roduct ficrochip's al or	1.02	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	1.82

PQ 44 MQFP 10:58 AM : 8/29/2013

Semiconductor Device Type	MS and UA	8 (Lead) MSOP 3x3mm (A3)		nation Base /			•	ogeneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	20.43	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	67.830	17.364	678.300		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.888	1.251	48.878		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin	Trade Secret	Mold Compound	4.888	1.251	48,878		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	0.501	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	0.061	2,394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	2.568	100,314			Total	100.00	-
Iron	7439-89-6	Lead Frame	0.247	0.063	2,468	2.69	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.051	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.003	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.002	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.144	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.027	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.014	563			Total	100.00	•
Modified Amine	827-43-0	Die Attach	0.026	0.007	263	0.19	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	1.920	75,000		Silver (Ag)	7440-22-4	75	
Doped Gold	7440-57-5	Wire Bond	0.200	0.051	2,000		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.320	12,500	D	iglycidylether of bisphenol-F	54208-63-8	8	
		TOTALS:	100.000	25.600	1,000,000		Modified Amine	827-43-0	4	
		g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ctive) and wit	h EU	1.92	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	7.5
miconductor device and its homogenous materials comply were 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via interior	th EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and wit	th EU	1.92	(mg) Total Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	7.5
2 2002/53/EC (End-of-Life Vehicles (ELV) Directive). nce with the above EU Directives has been verified via internical substance is absent from the list above, the chemical sated's knowledge and belief as of the date of this document	th EU Directive 20 al design controls ubstance is NOT a there is no credit	202/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concer	to the best o	f Microchip Te	echnology	1.92	, 5,	Chip (Die)	% of Total Weight	7.5
e 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Ince with the above EU Directives has been verified via interinical substance is absent from the list above, the chemical strated's knowledge and belief as of the date of this document not below the threshold of regulatory concern for any regulations compounds used by Microchip meet the UL94 V0 flammabile.	th EU Directive 20 al design controls ubstance is NOT a there is no credit ory scheme world ty standard for pla	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide.	to the best o	f Microchip Te chemical sub	echnology	1.92	, 5,	Chip (Die) 7440-21-3	% of Total Weight	7.5
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	th EU Directive 20 al design controls ubstance is NOT a there is no credit ory scheme world ty standard for pla	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. In it is a constant of the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide.	to the best o stration of the cobtain a test	f Microchip Te chemical sub t report at	echnology ostance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
we 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via interimical substance is absent from the list above, the chemical sorated's knowledge and belief as of the date of this document not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabil Lcom/global/eng/pages/offerings/industries/chemicals/plasticotective "tubes" in which the specific product is shipped are in	al design controls ubstance is NOT a there is no credit ory scheme world ty standard for place ande from polyvin orm concerning s s knowledge and l een compiled bas ets and some infe ese parts and the	DOZ/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concert-wide. astics. You can access the UL iQTM family of databases to a strict of the control	to the best of the obtain a test obtain a test of the packing corporated's ogy incorporated by resulting the obtained and resulting the obtained by	f Microchip To chemical sub treport at g slip on the co semiconducte ated cannot g aw material si	echnology stance, if outer box or devices uarantee uppliers. uppliers.		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via interimical substance is absent from the list above, the chemical strated's knowledge and belief as of the date of this document not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabil Loom/global/eng/pages/offerings/industries/chemicals/plastic prective "tubes" in which the specific product is shipped are intain "reels" may be made from PVC plastic. Inip Technology Incorporated believes the information in this is original packing materials is true and correct to the best of it inpleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade section is provided only as estimates of the average weight of it	al design controls ubstance is NOT a there is no credit ory scheme world ty standard for place and from polyvin orm concerning s is knowledge and il even compiled bas ets and some infe ese parts and the ained within silice express or implied	202/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concent-wide. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concent-wide. In it is in intentional ingredient in the semiconductor device and ole in the unavoidable impurity concent-wide. In it is intentional ingredient in the semiconductor databases to a state of the semiconductor in	to the best of the contraction o	f Microchip To chemical sub treport at g slip on the c semiconduct ated cannot g aw material si aw material si ese estimates	echnology stance, if outer box or devices uarantee uppliers. do not		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via internation in the list above, the chemical sorated's knowledge and belief as of the date of this document not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabil Lcom/global/eng/pages/offerings/industries/chemicals/plastic otective "tubes" in which the specific product is shipped are not attain "reels" may be made from PVC plastic. Inip Technology Incorporated believes the information in this is original packing materials is true and correct to the best of it inpleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secution is provided only as estimates of the average weight of the trace levels of dopants, metals, and non-metal materials con hip Technology Incorporated does not provide any warranty, ties provided by Microchip Technology Incorporated and its second in the se	al design controls ubstance is NOT a there is no credit ory scheme world ty standard for place and from polyvin orm concerning s is knowledge and I been compiled bas ets and some infe ese parts and the earined within silicat express or implied ubsidiaries are co	202/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. 20	to the best of the to the to obtain a test of the packing corporated's cogy incorporate by remblers and reponents. The exclusion. The exclusion. The exclusion of the test of	f Microchip To chemical sub treport at g slip on the co semiconductor ated cannot g aw material si aw material si ese estimates usive, limited p e provided in t, consequent	echnology estance, if buter box or devices uarantee uppliers. uppliers. do not product Microchip's	0.05	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

MS UA 08 MSOP 10:58 AM : 8/29/2013

Semiconductor Device Type: UN 10 (Leash MSOP 3xmm (6.7 kg)	MICROCHIP Semiconductor Device Type	a: IIN 10 //	MSOP arang (F2(F1)		nation Base A pper Alloy (C	-			ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	Semiconductor Device Type	. ON TO (Lead	, ,	% Total	T	1					63
Siles	Basic Substance	CAS Number			mg/part	nnm	6.66	(mg) Total	Mold Compound	% ot Total Weight	28.71
Expansion Figure			•		<u> </u>			Silica vitreous	60676-86-0	85.00	
Enoxy, Cressed Neverous: 2690-192-2 Model Compound 0.763 7.004									Trade Secret	6.13	
Cateon Black 1333-66-4 Mold Compound O.086 O.200 861 O.085 O	Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	1.758	0.408	17,585		Phenolic Resin	Trade Secret	6.13	
Copper Nicial 7440-96-9 Leas Frame 1,1-22 0.25 4,1-22 10.4 mg Total 160.00 Nicial 1440-92-4 Leas Frame 1,1-12 0.25 11,1-22 10.4 mg Total 1440-92-4 1240-92-4 Leas Frame 1,0-13 1,1-14 7,555 11,1-22 10.4 mg Total 1440-92-4 1240-9	Epoxy, Cresol Novolac	29690-82-2	Mold Compound	0.703	0.163	7,034		Epoxy, Cresol Novolac	29690-82-2	2.45	
Silver 17440-20-24 Lead Frame 0.751 0.714 7.760-15 Coper 7440-20-3 1. Lead Frame 0.751 0.751 0.714 7.760-15 Coper 7440-20-3 1. Lead Frame 0.751		1333-86-4	Mold Compound	0.086	0.020	861		Carbon Black	1333-86-4	0.30	
Silver 7440/224 Lead Frame 0.751 0.174 7,505 Capper 7400/204 Silver 7400/204 De Allach O.001 O.002 O.004 2,504 Silver 7400/204 O.004 O.001 O.003 O.000 O.000	Copper	7440-50-8	Lead Frame	42.830	9.937	428,299			Total	100.00	
Silver 7440/224 Lead Frame 0.751 0.174 7,505 Capper 7400/204 Silver 7400/204 De Allach O.001 O.002 O.004 2,504 Silver 7400/204 O.004 O.001 O.003 O.000 O.000	Nickel		Lead Frame	1.142	0.265	11.422	10.43	(mg) Total	Lead Frame	% of Total Weight	44 97
Silicon 1740-21-3 Lead Frame 0.202 0.047 2.024 No.045 1.040 1.04 1.04 1.04 1.04 1.04 1.04 1.0	Silver		Lead Frame	0.751			10110				44.07
Magnesium 1749-92-4 Die Attach 0.045 0.019 450											
Silver 7440-22-4 Die Attach 0.681 0.139 6.088 Acrylate resine Proprietary 1 Trade Secret Die Attach 0.138 0.032 1.366 Trade Secret Die Attach 0.015 0.004 154 Heterocyclic organic compound 1760-Secret Die Attach 0.015 0.004 154 Heterocyclic organic compound 1760-Secret Die Attach 0.015 0.004 154 Gold 7440-57-5 0.006 0.005 0											
Accystate resine Proprietary Trade Secret Die Attach 0.015 0.004 154 Trades design Trade Secret Die Attach 0.015 0.004 154 Trade Secret Die Attach 0.015 0.004 155 0.006 1.54 Trade Secret Die Attach 0.015 0.004 155 0.005 155 0.											
Treated allicia Trade Secret De Attach 0.015 0.004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Attach 1.0015 0.0004 154 0.18 mg] Trade Secret De Color De											
Heterocyclic organic compound Trade Secret De Attach (Dis) 0.004 154 0.18 (migl 7otal De Attach (No.01 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								Wagnesiam			
Silcon 7440:21-3 Chip (Display 10 Chip (0.40	() T .(.)			
Gold 1444-07-75 Wire Bond 0.880 0.158 6,800 Tin 1440-31-5 Paring on external basis (pror). Maths To / arrespended at 1507-056 to how: 2,2070 5,120 22070 TOTALS: 100,000 23.200 1,000,000 TOTALS: 100,000 23.200 1,000,000 TOTALS: 100,000 23.200 1,000,000 Total will be receive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass O.0232 g Total Mass O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). O.0232 g Total Mass In a semiconductor device and its homogenous materials completed sead on the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the product is shipped and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a transition in which the specific product is shipped are made from PVC plastic. O.16 (mg) Total Wile Bend Vehicles (Mg) Total Vehicles (Mg) Total Vehicles (Mg) Total Veh							0.18				0.77
Tin 7440-31-5 Patry on external basis (pare) - Mates Tir / armeable at 190°C for 1 to 100.000 2.3.200 1,000.000 1 Here revoke consists compounds that homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2012/65/EU (Ro											
Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive) and with EU 1. Chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and its above EU Directive). In plant of this device and its above EU Directive). In plant of this device and its above EU Directive). In plant of this device and its above the chemical substance is absent from the list above, the chemical substance is a sbeant from the list above, the chemical substance is a sbeant from the list above, the chemical substance is a sbeant from the list above, the chemical substance is a sbeant from the list above, the chemical substance is a specific organizated in the semiconductor device and to the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Identify the complete of this document, there is no credible reason to believe that the unavoidable impurity conentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Identify the complete of the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and rein original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form becaute the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and rein original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology incorporated cannot guarantee the provided only as substances in this form because it has been completed makerial suppliers. Suppliers and content of the specific product is a state secrets and some information may not have been provided by a subcontract assemblers											
3. semiconductor device and its homogenous materials comply with EU Directive). 1. semiconductor device and its homogenous materials comply with EU Directive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). 1. semiconductor device and its homogenous materials comply with EU Directive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). 1. semiconductor device and its homogenous materials comply with EU Directive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). 1. splanes with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. 1. splanes with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. 1. splanes with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. 1. splanes with the above EU Directives has been verified via internal design controls, supplier for the best of Microchip Technology incorporated in the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the series of the date of this document, there is no credible reason to bel	lin	7440-31-5									
s semiconductor device and its homogenous materials comply with EU Directive). 8002785/EC (RoHS Directi			TOTALS:	100.000	23.200	1,000,000	Hete	rocyclic organic compound		_	
is not below the threshold of regulatory concern for any regulatory scheme world-wide. Is not below the threshold of regulatory concern for any regulatory scheme world-wide. If ignore control in the	ctive 2002/53/FC (End-of-Life Vehicles (FLV) Directive)	with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	IS Recast Direc	ctive) and with	EU	0.65	Total (mg)	Chip (Die)	% of Total Weight	2.8
retain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in eir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the mpleteness and accuracy of data in this form because it has been compiled based on the ranges provided by subcontract assemblers and raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace rels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtained, sales order acknowledgement, and invoices. crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtained and provided and its subsidiaries are contained in Microchip's obtained and provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information in Microchip's obtained and	impliance with the above EU Directives has been verified via into	ernal design contro	ls, supplier declarations, and /or analytical test data.		•		0.65	,	7440-21-3	100	2.8
in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the impleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace els of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. **Crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product rranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's office and invoices. **Trachip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product rranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's of 15.12 (mg) Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 5.12 (mg) Total 7.12 (mg) Total 7.	mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemica orporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any reguluting compounds used by Microchip meet the UL94 V0 flammaters.	ernal design control I substance is NOT nt, there is no credi latory scheme work	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide.	, to the best of ntration of the o	Microchip Tec chemical subs	chnology		Doped Silicon	7440-21-3 Total	100	
arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 5.12 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions, sales order acknowledgement, and invoices. 6.12 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions, sales order acknowledgement, and invoices. 7.12 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and invoices. 8.12 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions, sales order acknowledgement, and invoices. 8.12 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matte Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matter Tin / Annealed at 150°C for local terms and conditions of sale. These are provided in Microchip's leads (pins) - Matter Tin /	impliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat p://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped and	ernal design control I substance is NOT nt, there is no credi latory scheme work bility standard for pi tics/	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concest-wide. lastics. You can access the UL iQTM family of databases the UL iQTM fami	, to the best of ntration of the o	Microchip Tec chemical subs	chnology tance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	impliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flammat p://ul.com/global/eng/pages/offerings/industries/chemicals/plas per protective "tubes" in which the specific product is shipped antain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this irroriginal packing materials is true and correct to the best of its impleteness and accuracy of data in this form because it has becomation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts	ernal design control I substance is NOT nt, there is no credi latory scheme work pility standard for p tics/ e made from polyvi s form concerning is s knowledge and be en compiled based d some information and the average w	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastic interval in the grade in this form. Microchip Technology In the lastic interval in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers and the interval in the lastic interval in the lastic in the lastic interval interval in the lastic interval in the lastic interval in	i, to the best of ntration of the o co obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materi	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial supplie	chnology stance, if atter box and r devices in antee the ers. Supplier oformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
Total 100.00	empliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat pp://ul.com/global/eng/pages/offerings/industries/chemicals/plass e protective "tubes" in which the specific product is shipped antain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this prioriginal packing materials is true and correct to the best of its impleteness and accuracy of data in this form because it has becomation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts rels of dopants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any warranty trranties provided by Microchip Technology Incorporated and its transfer in the company of the company trranties provided by Microchip Technology Incorporated and its transfer in the company of the company trranties provided by Microchip Technology Incorporated and its transfer in the company of the comp	ernal design control I substance is NOT nt, there is no credi latory scheme work pility standard for p tics/ e made from polyvi s form concerning is s knowledge and be en compiled based d some information and the average w in silicon devices (s y, express or implie	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics are responsible to the lastic in this form. Microchip Technology In the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the family of the lastic in this form. Microchip Technology in the lastic in this family in the lastic in this family in the lastic in this family in the lastic in the lastic in the lastic in this fa	to the best of ntration of the coordinates of the packing accorporated's segy Incorporated by raw materiand raw materiand raw materiand raw for these estimates the column transport of the column tra	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial suppliers. It is do not include sive, limited pr	chnology tance, if atter box and r devices in antee the ers. Supplier formation le trace	0.16	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.68
	impliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal p://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped antain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this original packing materials is true and correct to the best of its impleteness and accuracy of data in this form because it has becomation in the soften protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts rels of dopants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any warranty trranties provided orly Microchip Technology Incorporated and invoices. crochip disclaims any duty to notify users of updates or change terwise, suffered by users or third parties as a result of the user	ernal design control I substance is NOT nt, there is no credi latory scheme work collity standard for pi tics/ e made from polyvi s form concerning a s knowledge and be en compiled based d some information and the average w in silicon devices (s y, express or implie s subsidiaries are co	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. Justics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic in the lastic in this form. Microchip Technology In the lastic in this form. Microchip Technologo on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declaration ontained in Microchip's standard terms and conditions of	i, to the best of intration of the coordinates of oobtain a test oold the packing incorporated is say Incorporated vided by raw mand raw materi hese estimates tion. The exclusion. The exclusion is also intracted or indirect or indirect or indirect.	Microchip Tecchemical substreport at slip on the outside all suppliers. It is do not include sive, limited proportion of provided in No., consequentia.	chnology tance, if atter box and r devices in antee the ers. Supplier afformation le trace	0.16	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.68

UN 10 MSOP 10:58 AM : 8/29/2013

100.000

MICROCHIP Semiconductor Device	e Type: Pand PA 8 (I	.ead) PDIP (Small Outline300") (C4 / CK)		nation Base /	. ,			ogeneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	<u> </u>	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	388.39	(mg) Total	Mold Compound	% ot Total Weight	79.8
Fused Silica	60676-86-0	Mold Compound	57.456	279.638	574,560		Fused Silica	60676-86-0	72.00	
Metal Hydro Oxide	Trade Secret	Mold Compound	8.778	42.723	87,780		Metal Hydro Oxide	Trade Secret	11.00	
Epoxy Resin	Trade Secret	Mold Compound	5.586	27.187	55,860		Epoxy Resin	Trade Secret	7.00	
Phenol Resin SiO2	Trade Secret 14808-60-7	Mold Compound	5.586 1.995	27.187 9.710	55,860 19.950		Phenol Resin	Trade Secret	7.00	
Carbon Black	1333-86-4	Mold Compound Mold Compound	0.399	1.942	3,990		SiO2 Carbon Black	14808-60-7 1333-86-4	2.50 0.50	4
Copper	7440-50-8	Lead Frame	10.031	48.823	100.314		Calboli Black	Total	100.00	<u> </u>
Iron	7439-89-6	Lead Frame	0.247	1.201	2,468	51.10	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.974	2,000	31.10	Copper	7440-50-8	95.54	10.5
Zinc	7440-66-6	Lead Frame	0.013	0.064	131		Iron	7439-89-6	2.35	1
Phosphorous	7723-14-0	Lead Frame	0.009	0.042	87		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.550	2.678	5,502		Zinc	7440-66-6	0.13	1
Epoxy Resin	9003-36-5	Die Attach	0.110	0.535	1,100		Phosphorous	7723-14-0	0.08	
Diluent	3101-60-8	Die Attach	0.055	0.268	550			Total	100.00	Ī
Phenolic hardener	Trade secret	Die Attach	0.022	0.107	220	3.65	(mg) Total	Die Attach	% of Total Weight	0.75
Amine type hardener	827-43-0	Die Attach	0.011	0.054	110		Silver	7440-22-4	73.36	
Dicyandiamide	461-58-5	Die Attach	0.002	0.009	18		Epoxy Resin	9003-36-5	14.67	
Silicon	7440-21-3	Chip (Die)	7.500	36.503	75,000		Diluent	3101-60-8	7.33	
Doped Gold	7440-57-5	Wire Bond	0.200	0.973	2,000		Phenolic hardener	Trade secret	2.93	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	6.084	12,500		Amine type hardener	827-43-0	1.47	
		TOTALS:	100.000	486.700	1,000,000		Dicyandiamide	461-58-5 Total	0.24	
This semiconductor device and its homogenous materials co Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v	omply with EU Directive 20	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ctive) and wit	h EU	36.50	(mg) Total Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight]
If a chemical substance is absent from the list above, the ch Incorporated's knowledge and belief as of the date of this dc any, is not below the threshold of regulatory concern for any	ocument, there is no credib y regulatory scheme world-	le reason to believe that the unavoidable impurity concen wide.	ntration of the	chemical sub				Total	100.00	1
Molding compounds used by Microchip meet the UL94 V0 fla http://ul.com/global/eng/pages/offerings/industries/chemical		stics. You can access the UL IQTM family of databases to	o obtain a tesi	report at		0.97	(mg) Total	Wire Bond	% of Total Weight	0.2
The protective "tubes" in which the specific product is shipped and certain "reels" may be made from PVC plastic.	ped are made from polyviny	d chloride (PVC) plastic. "Window envelopes" used to ho	ld the packing	g slip on the o	outer box		Doped Gold	7440-57-5	100	
Microchip Technology Incorporated believes the information in their original packing materials is true and correct to the templeteness and accuracy of data in this form because Supplier information is often protected from disclosure as transformation is provided only as estimates of the average well include trace levels of dopants, metals, and non-metal materials.	best of its knowledge and be it has been compiled base ade secrets and some info ight of these parts and the	elief, as of the date listed in this form. Microchip Technol d on the ranges provided in Material Safety Data Sheets; rmation may not have been provided by subcontract asse average weight of anticipated significant toxic metals con	logy Incorpora provided by ra emblers and r	ated cannot g aw material so aw material s	uarantee uppliers. uppliers.			Total	100.00	
Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated quotations, sales order acknowledgement, and invoices.						6.08	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	1.25
Microchip disclaims any duty to notify users of updates or c otherwise, suffered by users or third parties as a result of th or of this Certificate of Compliance for semiconductor produ	ne users' reliance on the inf						Tin	7440-31-5	100.00	
								Total	100.00	7

P PA 08 PDIP 10:58 AM : 8/29/2013

486.700

Basic Substance	Semiconductor Devic	 ce Type: Pand PE 14 (Le	ad) PDIP (Small Outline300") (D2 / DF)		nation Base A pper Alloy (C				nogeneous Materials: a.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
State Content Conten				% Total							
Mater Indicate Dispose Marcial Compound 2.773 \$1.061 \$1.750 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000 \$1.0000	Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	760.73	(mg) Total	Mold Compound	% ot Total Weight	79.8
Floor Picture Trade Secret Mode Compound 5,586 \$0,251 56,800 Floor Name Trade Secret 7,00 Floor Picture Mode Compound 5,586 \$0,251 56,800 Floor Name Trade Secret 7,00 Floor Name Trade Secr	Fused Silica	60676-86-0	Mold Compound	57.456	547.728	574,560		Fused Silica	60676-86-0	72.00	
Private Risch Trade Scott Motol Conground 5,586 53,251 56,800 103,51	Metal Hydro Oxide	Trade Secret	Mold Compound			87,780		Metal Hydro Oxide	Trade Secret	11.00	
Signature 1985 19											
Cashon Blook Copper 1746-50-50 Lead Finne 10.03 10.04 10.05											
Copper											
Find						-,		Carbon Black			
Selver											
Total Tota						,	100.10				10.5
Procedure of the special process of the speci											
Silver 7440-224 Die Attach 0.583 5.802 5.625 Each 7440-656 0.13 Total Functionalized Unthane Resin 7460-24 Die Attach 0.038 0.357 375 Total											
Designed Reain 94-80-4 Die Attach 0.113 1.072 1.125 Fincumatized Urethrane Reain 7280-96-4 Die Attach 0.038 0.387 375 Epoxy Resin 0.003-30-5 Die Attach 0.038 0.387 375 Epoxy Resin 1.0561-055 Die Attach 0.019 0.179 188 Codd 1.749-057-5 Wire Bond 0.02-00 1.907 2.000 Tim 7440-057-5 Wire Bond 0.02-00 1.907 2.000 Tim 7440-057-5 Die Attach 0.000 9.000 1.907 2.000 Tim 7440-057-5 Die Attach 0.000 9.000 1.907 2.000 Tim 7440-057-5 Die Attach 0.000 9.000 1.907 2.000 Epoxy Resin 0.000-000 0.00											
Functionalized Urehane Resin 7,889-96-4 Die Attach 0.038 0.357 375 Epoxy Resin 9,500-36-5 Die Attach 0.019 0.179 188 7.58 Epoxy Resin 1,5561-08-5 Die Attach 0.019 0.179 188 7.58 Silicon 7,440-21-3 Ofine (Die) 7,500 7,148 75,500 1											
Epoxy Resin 1356:095 De Attach 0.019 0.179 188 500 September 1356:095 De Attach 0.019 1.0179 188 Siltion 7.440:21:3 Chip (Die) 7.500 71.498 75.000 1.907 2.000 1.9						, .		Filospilorous			<u>I</u>
Epowy Respin 13961-08-5 Die Attach Die							7.45	/mm) Total			0.75
Silscon 7440;21:3 Chip (Dis) 75,000 71,488 75,000 1 75,000 71,488 75,000 71,488 75,000 71,488 75,000 71,488 71,489							7.15				0.75
Gold 7440-57-5 Wire Bond 0.200 1.907 2.000 Tin 7440-31-5 Pergro orderent lesse (pre). Meths Tri Amenated at 150°C for how 1.250 11.950 11.916 12.500 1.000.000 953.30 1,000,000 1.000.000 953.30 1,0											
Tin T440-31-5 Pulsage neutremakes (pres). Matte Th' Annealed at 190°C for 1 hour 1074LS: 10.000 95.3.00 1,000,000 1000,0							Eupo				
### TOTALS: 100,000 953,30 1,000,000 ### TOTALS: 100,000 953,300 1,000,000 953,300 1,000,000 ### TOTALS: 100,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000,000 953,300 1,000 953,300 1,000,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 953,300 1,000 9							1 dile				
O.9533 g Total Mass emiconductor device and its homogenous materials comply with EUD Directive 2002/95/EC (Roh-Of-Life Vehicles (ELV) Directive). 71.50 Total (mg) Chip (Die) % of Total Weight 7.5 linear with the above EUD Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 82. Dispersion of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if so not below the threshold of regulatory corneon for any regulatory scheme world-wide. 83. go compounds used by Microchip meet the UL94 V0 Hammability standard for plastics. You can access the UL IQTM family of databases to obtain a test report at full-condigobal engages offerings/industries/chemicals/plastics/ 84. chip Technology incorporated believes the information in this form polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and in "reels" may be made from PVC plastic. 85. chip Technology incorporated believes the information in this form because it has been completed based on the ranges provided in Material Suppliers. Information wided only as estimates of the average weight of these parts and the average weight of these parts and the average weight of the separation and he average weight of these parts and the average weight of an average weight of these parts and the average weight of an average weight of the separation and he average weight of an average weight of a microchip's standard terms and conditions of sale. These are provided by Microchip Technology incorporated acknowledgement, and invoices. 85. chip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or wise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or	1111	7440010								3	
semiconductor device and its homogenous materials comply with EU Directive 2020;95/EC (RoH-G-Lie Vehicles (ELV) Directive). Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) Total (mg) Chip (Die) % of Total Weight 7.5 Total (mg) T		0.0522 -				.,,		EBOXY PROGET		100.00	U
is not below the threshold of regulatory concern for any regulatory scheme world-wide. Ing compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at (mg) Total Wire Bond % of Total Weight 0.2 Ing protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and a protective slip on the outer box and	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive)).	, ,		,		71.50	Total (mg)	Chip (Die)	% of Total Weight	7.5
ochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace is of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's leads (pins) - Matter Tin Jannealed at 150°C for Janualed at 1	chemical substance is absent from the list above, the	chemical substance is NOT a	n intentional ingredient in the semiconductor device and					Doped Silicon		100	
rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in roriginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pipteteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier roriginal so of the protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace its of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Trochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's attains, sales order acknowledgement, and invoices. Plating on external leads (pins) - Matte Tin / annealed at 150°C for the second in Microchip's annealed at	chemical substance is absent from the list above, the or prporated's knowledge and belief as of the date of this in it, is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 :://ul.com/global/eng/pages/offerings/industries/chemic	chemical substance is NOT as document, there is no credible any regulatory scheme world- offlammability standard for pla- cals/plastics/	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases	ntration of the	chemical subs	stance, if	1.91	(mg) Total	Total Wire Bond	100 100.00 % of Total Weight	
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 11.92 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 4 hour total weight 1.25 12.55 manual terms and conditions of sale. These are provided in Microchip's 11.92 mg Total leads (pins) - Matte Tin / annealed at 150°C for 4 hour total weight 1.25 12.56 mg Total leads (pins) - Matte Tin / annealed at 150°C for 4 hour total weight 1.25 13.92 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 4 hour total weight 1.25 13.92 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 4 hour total weight 1.25 13.92 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 1.25 13.93 (mg) Total Weight 1.25 13.94 (mg) Total Weight 1.25 13.95 (mg) Total Weight 1.25 13.96 (mg) Total Weight 1.25 13.97 (mg) Total Weight 1.25 13.98 (mg) Total Weight 1.25 13.99 (mg) Total Weight 1.25 13.90 (mg) Total Weight 1.25 13.91 (mg) Total Weight 1.25 13.92 (mg) Total We	chemical substance is absent from the list above, the coorporated's knowledge and belief as of the date of this v, is not below the threshold of regulatory concern for a lding compounds used by Microchip meet the UL94 V0 pp://ul.com/global/eng/pages/offerings/industries/chemic	chemical substance is NOT as document, there is no credible any regulatory scheme world- offlammability standard for pla- cals/plastics/	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases	ntration of the	chemical subs	stance, if	1.91	(mg) Total	Total Wire Bond	100 100.00 % of Total Weight	
erwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or his Certificate of Compliance for semiconductor products.	chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this v, is not below the threshold of regulatory concern for a lding compounds used by Microchip meet the UL94 V0 p://ul.com/global/eng/pages/offerings/industries/chemic e protective "tubes" in which the specific product is shi tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information ir original packing materials is true and correct to the bempleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade second only as estimates of the average weight of these provided only as estimates of the average weight of these	chemical substance is NOT at document, there is no credible any regulatory scheme world-offlammability standard for placals/plastics/ sipped are made from polyving place in this form concerning subject of its knowledge and belief that been compiled based or crets and some information in use parts and the average welg	n intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of the Identity of	ntration of the to obtain a test old the packing ncorporated's gy Incorporate wided by raw n and raw mater	report at slip on the ousemiconductor d cannot guaranaterial suppliers. In	stance, if uter box and r devices in antee the ers. Supplier nformation	1.91	(mg) Total	Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
	chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this it, is not below the threshold of regulatory concern for a Iding compounds used by Microchip meet the UL94 V0 pc/l/ul.com/global/eng/pages/offerings/industries/chemic e protective "tubes" in which the specific product is shi tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information original packing materials is true and correct to the benpleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade secondidated by as estimates of the average weight of theeles of dopants, metals, and non-metal materials contains erochip Technology Incorporated does not provide any	chemical substance is NOT are document, there is no credible any regulatory scheme world-inflammability standard for platicals/plastics/ alipped are made from polyviny ion in this form concerning subject of its knowledge and belief it has been compiled based or crets and some information mee parts and the average weighed within silicon devices (silicum warranty, express or implied,	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of chloride (PVC) plastic. "Window envelopes" used to help the stances restricted by RoHS in Microchip Technology I ef, as of the date listed in this form. Microchip Technolog in the ranges provided in Material Safety Data Sheets propay not have been provided by subcontract assemblers ght of anticipated significant toxic metals components. To con IC) in the finished parts. with respect to the information provided in this declara	ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw mater These estimate tion. The exclu	report at I slip on the outline of the conductor of cannot guaranaterial suppliers. It is do not includisive, limited p	stance, if uter box and r devices in antee the ers. Supplier nformation de trace		(mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.2
	chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this is, is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0:://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shi tain "reels" may be made from PVC plastic. rochip Technology Incorporated believes the information ir original packing materials is true and correct to the bigneteness and accuracy of data in this form because information is often protected from disclosure as trade securovided only as estimates of the average weight of the sels of dopants, metals, and non-metal materials contain rochip Technology Incorporated does not provide any tranties provided by Microchip Technology Incorporated tations, sales order acknowledgement, and invoices.	chemical substance is NOT at document, there is no credible any regulatory scheme world- offammability standard for placeals/plastics/ sipped are made from polyviny in this form concerning subset of its knowledge and belief the scheme compiled based or crets and some information made within silicon devices (siliculary express or implied, and nits subsidiaries are controlled in the substance of the users' reliance on the information on the controlled in the substance of the users' reliance on the information on the information of the users' reliance on the information of	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce wide. stics. You can access the UL iQTM family of databases of Ichloride (PVC) plastic. "Window envelopes" used to help the stances restricted by RoHS in Microchip Technology I ef, as of the date listed in this form. Microchip Technolog In the ranges provided in Material Safety Data Sheets proapy not have been provided by subcontract assemblers ght of anticipated significant toxic metals components. The con IC) in the finished parts. with respect to the information provided in this declarantained in Microchip's standard terms and conditions of Declarations and shall not be liable for any damages, d	ntration of the to obtain a test old the packing incorporated's a gradual transport of the packing incorporate wided by raw mand raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect or indirect or indirect or obtains a test of the packing in	report at y slip on the outline of the outline	stance, if uter box and r devices in antee the ers. Supplier information de trace roduct incrochip's		(mg) Total Doped Gold (mg) Total	Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 4 hours	100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	0.2

P PE 14 PDIP 10:58 AM : 8/29/2013

MICROCHIP				nation Base A				nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: Pand PE 16 (Lead) P	DIP (Small Outline300") (D6 / DU)								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	748.83	(mg) Total	Mold Compound	% ot Total Weight	67.3
Silica, vitreous	60676-86-0	Mold Compound	57.205	636.503	572,050		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.122	45.866	41,221		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.122	45.866	41,221		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.649	18.346	16,489		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.202	2.246	2,019		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	29.426	327.409	294,256			Total	100.00	
Iron	7439-89-6	Lead Frame	0.724	8.054	7,238	342.70	(mg) Total	Lead Frame	% of Total Weight	30.8
Silver	7440-22-4	Lead Frame	0.587	6.528	5,867		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.039	0.428	385		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.025	0.283	254		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.052	0.576	518		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.016	0.179	161		Phosphorous	7723-14-0	0.08	
Gamma-butyrolactone	96-48-0	Die Attach	0.002	0.023	21			Total	100.00	
Silicon	7440-21-3	Chip (Die)	0.150	1.669	1,500	0.78	(mg) Total	Die Attach	% of Total Weight	0.07
Gold	7440-57-5	Wire Bond	0.040	0.445	400		Silver	7440-22-4	74	
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.640	18.248	16,400		Epoxy resin	Trade Secret	23	
		TOTALS:	100.000	1,112.670	1,000,000		Gamma-butyrolactone	96-48-0	3	
	1.1127 g To	tal Mass						Total	100.00	=
semiconductor device and its homogenous materials comply	with EU Directive 2002/95	EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	tive) and with	ELI Directive					
1/53/EC (End-of-Life Vehicles (ELV) Directive).		, , , , , , , , , , , , , , , , , , , ,	5 1100uot 200	,	LO DII ective	1.67	Total (mg)	Chip (Die)	% of Total Weight	0.15
ppliance with the above EU Directives has been verified via int		olier declarations, and /or analytical test data.		·		1.67	Total (mg) Doped Silicon	7440-21-3	100	0.15
pliance with the above EU Directives has been verified via int themical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume to below the threshold of regulatory concern for any regulator	Il substance is NOT an inte ent, there is no credible rea y scheme world-wide.	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer	to the best of atration of the o	Microchip Tec chemical subs	hnology	1.67		,		0.15
npliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemica orporated's knowledge and belief as of the date of this docume of below the threshold of regulatory concern for any regulator ding compounds used by Microchip meet the UL94 V0 flamma	Il substance is NOT an inte ent, there is no credible rea y scheme world-wide. ibility standard for plastics	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer	to the best of atration of the o	Microchip Tec chemical subs	hnology	0.45		7440-21-3	100	0.15
2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via intended in the list above, the chemical substance is absent from the list above, the chemical properties of the date of this docume of below the threshold of regulatory concern for any regulator ding compounds used by Microchip meet the UL94 V0 flamma: 2/ful.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar ain "reels" may be made from PVC plastic.	al substance is NOT an inte ent, there is no credible rea y scheme world-wide. ibility standard for plastics stics/	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer	to the best of attration of the o	Microchip Tec chemical subs	hnology tance, if any,		Doped Silicon	7440-21-3 Total	100	
npliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemica orporated's knowledge and belief as of the date of this docume of below the threshold of regulatory concern for any regulator ding compounds used by Microchip meet the UL94 V0 flamma by/ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped an	all substance is NOT an inte- sent, there is no credible rea- y scheme world-wide. billity standard for plastics stics/ e made from polyvinyl chla- is form concerning substa- s knowledge and belief, as en compiled based on the d some information may in nd the average weight of an	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to homes restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technolog ranges provided in Material Safety Data Sheets provided by subcontract assemblers a sticipated significant toxic metals components. The	to the best of ntration of the coordinates of o obtain a test old the packing accorporated's s y Incorporated ided by raw mander is under the coordinates of mander is mander is	Microchip Techemical substreport at slip on the outer silp on the outer silp of the outer silp	tance, if any, atter box and r devices in intee the rs. Supplier formation is		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
inpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical proprated's knowledge and belief as of the date of this docume of below the threshold of regulatory concern for any regulator ding compounds used by Microchip meet the UL94 V0 flamma://lul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped arain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in the roriginal packing materials is true and correct to the best of it inpleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets an vided only as estimates of the average weight of these parts at	all substance is NOT an inte- sent, there is no credible rea- y scheme world-wide. Ibility standard for plastics stics/ e made from polyvinyl chla- is form concerning substa- s knowledge and belief, as en compiled based on the d some information may in nd the average weight of an ion devices (silicon IC) in t y, express or implied, with	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to homes restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technolog ranges provided in Material Safety Data Sheets provided by subcontract assemblers a sticipated significant toxic metals components. These finished parts.	to the best of obtain a test of obtain a test old the packing acorporated's sy Incorporated ided by raw mind raw materiase estimates dion. The exclusion.	Microchip Techemical substreport at slip on the outeniconductod cannot guaraterial supplie al suppliers. Ir o not include sive, limited prices, limited prices	thnology tance, if any, atter box and r devices in intee the rs. Supplier information is trace levels		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
npliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemical opporated's knowledge and belief as of the date of this docume of below the threshold of regulatory concern for any regulator ding compounds used by Microchip meet the UL94 V0 flamma://lul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped are ain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in the roriginal packing materials is true and correct to the best of it apleteness and accuracy of data in this form because it has be rmation is often protected from disclosure as trade secrets an vided only as estimates of the average weight of these parts an opants, metals, and non-metal materials contained within silic prochip Technology Incorporated does not provide any warrant tranties provided by Microchip Technology Incorporated and it	all substance is NOT an interest, there is no credible reary scheme world-wide. Ibility standard for plastics stics/ e made from polyvinyl chle is form concerning substates is knowledge and belief, as en compiled based on the d some information may not the average weight of an on devices (silicon IC) in the substitution of the average weight of a substitution of the substitution in	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to homes restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets provot have been provided by subcontract assemblers a titicipated significant toxic metals components. There finished parts. respect to the information provided in this declarated in Microchip's standard terms and conditions of sarations and shall not be liable for any damages, directions.	to the best of attraction of the coordinates of the	Microchip Techemical substreport at slip on the outer cannot guaraterial supplies la suppliers. Ir o not include sive, limited provided in Microsequentia	thnology tance, if any, atter box and r devices in intee the rs. Supplier iformation is trace levels	0.45	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	100 100.00 100.00 % of Total Weight 100 100.00	0.04
eliance with the above EU Directives has been verified via int semical substance is absent from the list above, the chemical sorated's knowledge and belief as of the date of this docume below the threshold of regulatory concern for any regulator ng compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/plas rotective "tubes" in which the specific product is shipped arn "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information in the original packing materials is true and correct to the best of it leteness and accuracy of data in this form because it has benation is often protected from disclosure as trade secrets anded only as estimates of the average weight of these parts and contains, metals, and non-metal materials contained within silic chip Technology Incorporated does not provide any warrant nities provided by Microchip Technology Incorporated and it tions, sales order acknowledgement, and invoices. Chip disclaims any duty to notify users of updates or change wise, suffered by users or third parties as a result of the user.	all substance is NOT an interest, there is no credible reary scheme world-wide. Ibility standard for plastics stics/ e made from polyvinyl chle is form concerning substates is knowledge and belief, as en compiled based on the d some information may not the average weight of an on devices (silicon IC) in to y, express or implied, with a subsidiaries are contained.	olier declarations, and /or analytical test data. Intional ingredient in the semiconductor device and, son to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to homes restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets provot have been provided by subcontract assemblers a titicipated significant toxic metals components. There finished parts. respect to the information provided in this declarated in Microchip's standard terms and conditions of sarations and shall not be liable for any damages, directions.	to the best of attraction of the coordinates of the	Microchip Techemical substreport at slip on the outer cannot guaraterial supplies la suppliers. Ir o not include sive, limited provided in Microsequentia	thnology tance, if any, atter box and r devices in intee the rs. Supplier iformation is trace levels	0.45	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.04

P 16 PDIP 10:59 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: P 18 (Lead)	PDIP .300° (F3/FP)		nation Base A pper Alloy (Cu			•	ogeneous Materials: .g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	995.90	(mg) Total	Mold Compound	% ot Total Weight	79.8
Fused Silica	60676-86-0	Mold Compound	57.456	717.051	574,560		Fused Silica	60676-86-0	72.00	
Metal Hydro Oxide	Trade Secret	Mold Compound	8.778	109.549	87,780		Metal Hydro Oxide	Trade Secret	11.00	
Epoxy Resin Phenol Resin	Trade Secret	Mold Compound	5.586 5.586	69.713 69.713	55,860 55,860		Epoxy Resin	Trade Secret	7.00 7.00	
SiO2	Trade Secret 14808-60-7	Mold Compound Mold Compound	1.995	24.898	19,950		Phenol Resin SiO2	Trade Secret 14808-60-7	2.50	
Carbon Black	1333-86-4	Mold Compound	0.399	4.980	3,990		Carbon Black	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	10.031	125.192	100,314		Garbon Black	Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	3.079	2,468	131.04	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	2.496	2,000	131.04	Copper	7440-50-8	95.54	10.5
Zinc	7440-66-6	Lead Frame	0.013	0.164	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.104	87		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.554	6.908	5,535		Zinc	7440-66-6	0.13	
Epoxy Resin	9003-36-5	Die Attach	0.141	1.760	1,410		Phosphorous	7723-14-0	0.08	
t-Butyl phenyl glycidyl ether	3101-60-8	Die Attach	0.047	0.590	473			Total	100.00	
Phenolic hardener	92-88-6	Die Attach	0.002	0.028	23	9.36	(mg) Total	Die Attach	% of Total Weight	0.75
						0.00				00
Butyl cellosolve acetate	112-07-2	Die Attach	0.006	0.075	60		Silver	7440-22-4	74	
Silicon	7440-21-3	Chip (Die)	7.500	93.600	75,000		Epoxy Resin	9003-36-5	19	
Gold	7440-57-5	Wire Bond	0.200	2.496	2,000	t	Butyl phenyl glycidyl ether	3101-60-8	6	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour TOTALS:	1.250 100.000	15.600 1.248.000	12,500 1.000.000		Phenolic hardener	92-88-6 112-07-2	0	
			100.000	1,248.000	1,000,000		Butyl cellosolve acetate		1 100.00	
	1.2480	g Total Mass						Total	100.00	
This semiconductor device and its homogenous materials or Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v		, , , , , , , , , , , , , , , , , , , ,	15 Recast Direc	tive) and with	EU	93.60	Total (mg) Doped Silicon	7440-21-3	% of Total Weight	7.5
		-, FF ,,,								
If a chemical substance is absent from the list above, the ch Incorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any	ocument, there is no credi	ble reason to believe that the unavoidable impurity conce						Total	100.00	
Molding compounds used by Microchip meet the UL94 V0 fla	mmability standard for p		o obtain a test	report at						
http://ul.com/global/eng/pages/offerings/industries/chemical	s/plastics/	astics. You can access the UL iQTM family of databases t		•		2.50	(mg) Total	Wire Bond	% of Total Weight	0.2
Molding compounds used by Microchip meet the UL94 V0 fla http://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is ships certain "reels" may be made from PVC plastic.	s/plastics/	astics. You can access the UL iQTM family of databases t		•	ter box and	2.50	(mg) Total Gold	7440-57-5	100	0.2
http://ul.com/global/eng/pages/offerings/industries/chemical: The protective "tubes" in which the specific product is shipp	s/plastics/ ped are made from polyvin in this form concerning s st of its knowledge and be has been compiled based lets and some information parts and the average we	astics. You can access the UL iQTM family of databases to a substances restricted by RoHS in Microchip Technology Ir lief, as of the date listed in this form. Microchip Technologo the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. T	old the packing ncorporated's s gy Incorporate vided by raw n and raw materi	semiconductor d cannot guara naterial supplie al suppliers. In	devices in intee the irs. Supplier iformation	2.50	1			0.2
http://ul.com/global/eng/pages/offerings/industries/chemical: The protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the bescompleteness and accuracy of data in this form because it hinformation is often protected from disclosure as trade secre is provided only as estimates of the average weight of these	s/plastics/ ped are made from polyving in this form concerning stof its knowledge and be as been compiled based tets and some information parts and the average we divithin silicon devices (sarranty, express or implie	astics. You can access the UL iQTM family of databases to a substances restricted by RoHS in Microchip Technology Ir lief, as of the date listed in this form. Microchip Technologo the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. Tillicon IC) in the finished parts.	old the packing ncorporated's s gy Incorporate vided by raw n and raw materi 'hese estimate	slip on the our semiconductor d cannot guara naterial supplie al suppliers. In s do not includ sive, limited pr	devices in intee the ers. Supplier iformation e trace	2.50	Gold	7440-57-5	100	1.25
http://ul.com/global/eng/pages/offerings/industries/chemical- The protective "tubes" in which the specific product is ship- certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the bes completeness and accuracy of data in this form because it h information is often protected from disclosure as trade secre is provided only as estimates of the average weight of these levels of dopants, metals, and non-metal materials contained. Microchip Technology Incorporated does not provide any wa warranties provided by Microchip Technology Incorporated is	s/plastics/ ped are made from polyving in this form concerning stor its knowledge and be also been compiled based on the parts and the average well within silicon devices (sarranty, express or implies and its subsidiaries are contained to the content of the con	astics. You can access the UL iQTM family of databases to a control of the property of the provided in this form. Microchip Technology In lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers in light of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declaration and in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, diet provided in a provided in the provided in the declaration of the provided in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, diet provided in the provided	ncorporated's a gy Incorporate vided by raw n and raw materi hese estimate tion. The exclusale. These are	slip on the our semiconductor d cannot guara naterial supplie al supplies al suppliers. In s do not includ sive, limited preprovided in Marc, consequentia	devices in ntee the rs. Supplier formation e trace oduct icrochip's		Gold	7440-57-5 Total Plating on external leads (pins) - Matte Tin	100	
http://ul.com/global/eng/pages/offerings/industries/chemicals. The protective "tubes" in which the specific product is shipperentain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it horomation is often protected from disclosure as trade secres provided only as estimates of the average weight of these evels of dopants, metals, and non-metal materials contained. Alicrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated a juotations, sales order acknowledgement, and invoices. Alicrochip disclaims any duty to notify users of updates or contherwise, suffered by users or third parties as a result of the	s/plastics/ ped are made from polyving in this form concerning stor its knowledge and be also been compiled based on the parts and the average well within silicon devices (sarranty, express or implies and its subsidiaries are contained to the content of the con	astics. You can access the UL iQTM family of databases to a control of the property of the provided in this form. Microchip Technology In lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers in light of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declaration and in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, diet provided in a provided in the provided in the declaration of the provided in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, diet provided in the provided	ncorporated's a gy Incorporate vided by raw n and raw materi hese estimate tion. The exclusale. These are	slip on the our semiconductor d cannot guara naterial supplie al supplies al suppliers. In s do not includ sive, limited preprovided in Marc, consequentia	devices in ntee the rs. Supplier formation e trace oduct icrochip's		Gold (mg) Total	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight	

P 18 PDIP 10:59 AM: 8/29/2013

MICROCHIP	B. 00	nnin .		nation Base A pper Alloy (C	•		•	nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device Ty	De: P 20 (Lead) I		0/ T -/-!							e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	1045.39	(mg) Total	Mold Compound	% ot Total Weight	69.1
Fused Silica	60676-86-0	Mold Compound	49.752	752.683	497,520		Fused Silica	60676-86-0	72.00	
Metal Hydro Oxide	Trade Secret	Mold Compound	7.601	114.993	76,010		Metal Hydro Oxide	Trade Secret	11.00	
Epoxy Resin	Trade Secret	Mold Compound	4.837	73.178	48,370		Epoxy Resin	Trade Secret	7.00	
Phenol Resin	Trade Secret	Mold Compound	4.837	73.178	48,370		Phenol Resin	Trade Secret	7.00	
SiO2	14808-60-7	Mold Compound	1.728	26.135	17,275		SiO2	14808-60-7	2.50	
Carbon Black	1333-86-4	Mold Compound	0.346	5.227	3,455		Carbon Black	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	27.687	418.865	276,868		,	Total	100.00	_
Iron	7439-89-6	Lead Frame	0.681	10.303	6,810	438.43	(mg) Total	Lead Frame	% of Total Weight	28.98
Silver	7440-22-4	Lead Frame	0.552	8.352	5.521		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.036	0.548	362		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.024	0.362	239		Silver	7440-22-4	1.91	
Silver (Aa)	7440-22-4	Die Attach	0.068	1.021	675		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.013	0.191	126		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.007	0.102	68			Total	100.00	u
Modified Amine	827-43-0	Die Attach	0.003	0.048	32	1.36	(mg) Total	Die Attach	% of Total Weight	0.09
Silicon	7440-21-3	Chip (Die)	0.300	4.539	3.000	1.00	Silver (Aa)	7440-22-4	75	0.03
Gold	7440-57-5	Wire Bond	0.020	0.303	200		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.510	22.844	15.100		Diglycidylether of bisphenol	54208-63-8	8	
1111	7440-31-3	TOTALS:	100.000	1.512.870	1.000.000		Modified Amine	827-43-0	4	
	4 5400	a Total Mass	100.000	1,512.070	1,000,000		Woulled Affilie	Total	100.00	U
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via in	nternal design contro	ls, supplier declarations, and /or analytical test data.				4.54	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	0.3
If a chemical substance is absent from the list above, the chemi- Incorporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any requirements.	nent, there is no cred julatory scheme worl	ble reason to believe that the unavoidable impurity concerd-wide.	ntration of the	chemical subs				Total	100.00	
Molding compounds used by Microchip meet the UL94 V0 flamm http://ul.com/global/eng/pages/offerings/industries/chemicals/pla		lastics. You can access the UL iQTM family of databases t	to obtain a test	report at		0.30	(mg) Total	Wire Bond	% of Total Weight	0.02
The protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic.	are made from polyvi	nyl chloride (PVC) plastic. "Window envelopes" used to he	old the packing	slip on the ou	iter box and		Doped Gold	7440-57-5	100	
Microchip Technology Incorporated believes the information in their original packing materials is true and correct to the best of completeness and accuracy of data in this form because it has information is often protected from disclosure as trade secrets, in provided only as estimates of the average wight of these parts.	its knowledge and be been compiled based and some information ts and the average w	elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I	gy Incorporate vided by raw n and raw mater	d cannot guara naterial supplic al suppliers. Ir	antee the ers. Supplier nformation			Total	100.00	
levels of dopants, metals, and non-metal materials contained with	inii sincon acvices (s									
	nty, express or implie					22.84	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	1.51
levels of dopants, metals, and non-metal materials contained wi Microchip Technology Incorporated does not provide any warra warranties provided by Microchip Technology Incorporated and	nty, express or implie its subsidiaries are c ges to Material Conte	ontained in Microchip's standard terms and conditions of int Declarations and shall not be liable for any damages, di	sale. These are	provided in N	licrochip's	22.84	(mg) Total	leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	1.51
levels of dopants, metals, and non-metal materials contained wir Microchip Technology Incorporated does not provide any warran warranties provided by Microchip Technology Incorporated and quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or chan otherwise, suffered by users or third parties as a result of the us	nty, express or implie its subsidiaries are c ges to Material Conte	ontained in Microchip's standard terms and conditions of int Declarations and shall not be liable for any damages, di	sale. These are	provided in N	licrochip's	22.84	<u> </u>	leads (pins) - Matte Tin / annealed at 150°C for 1 hour		

P 20 PDIP 10:59 AM : 8/29/2013

ompliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. olding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ttp://lu.com/global/eng/pages/offerings/industries/chemicals/plastics/ he protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and artain "reels" may be made from PVC plastic. Total 100.00 Doped Gold 7440-57-5 100 Doped Gold 7440-57-5	MICROCHIP Semiconductor Device Typ	e: PG 24 (Lead	PDIP Wide Outline600" (J4 / JT)		nation Base A pper Alloy (C	•		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Siles, ymenus	Rasic Substance	CAS Number			mg/part	nnm	1267.01	(mg) Total	Mold Compound	% ot Total Weight	68.46
Epony Reson No Journal No Journal Part Secret Model Compound 4.193 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004 4.192 77.004			•					Silica vitreous	60676-86-0	85.00	1
Phenoir Rean No. Br / Cz. \$5003. No distrimony provides 7400-51-2 Modi Compound 4.193 77.504 4.192.4 16.77 31.04.7 16.77 1.192.5 16.77 1.192.5 16.77 1.192.5 16.77 1.192.5 16.77 1.192.5 1											1
Epoxy Casted Notices 2690-392.2 Modi Compound 1,977 31,042 16,775 2,054											1
Calmon Black Copper 774495-95 Lead Frame 77430 1515-00 278-307 17495-96 Lead Frame 774095-96											1
Copper New Year Service of Comparison of Comparison Control of Control											
Silver 7440-22-4 Leaf Trane 0.055 12:099 6,846 59.12 (real Years 1 Septem 7440-22-5 1.00 Frame 1 Control 1 Septem 1 Septem 1 Control 1 Septem				27 830	515,060	278 301					<u>4</u> 1
Silver 1440-22-4 Leaf Trame 0.055 10.2770 5.549 Total Mass Froz 7440-05-6 Leaf Trame 0.055 10.2770 1.055 10.2770						,	539 12	(mg) Total			
Zinc 7440-56-6 Leaf Frame 0.036 0.574 364 Set Phosphrous 772-15-10 Leaf Frame 0.024 0.455 245 Set 7440-22-4 Dis Allach 0.034 0.055 0.054 0.054 0.054 0.054 0.054 0.054 0.054 0.055 0.054 0.054 0.054 0.054 0.054 0.055 0.055 0.054 0.054 0.054 0.054 0.055 0.055 0.055 0.055 0.054 0.055	·					- ,	333.12				25.15
Phosphorous 7723-14-0 Lead Frame 0.024 0.445 240 Silver 7440-22-4 Dis Altach 0.104 1.917 1.036 Epopy resin Trade Secret Dis Altach 0.032 0.596 322 Contine Duyloctorio 0.924-03 Dis Altach 0.032 0.596 322 Cold 7440-57-5 Wire Bond 7440-57-5 Wire Bond 7440-57-5 Trade Secret 0.000 1.950-730 0.000 0.595 0.000 TOTALS: 100.000 1.950-730 0.000 0.595 0.000 TOTALS: 100.000 1.950-730 0.000 0.595 0.000 TOTALS: 100.000 1.950-730 0.000 0.955 0.000 TOTALS: 100.000 0.950-730 0.000 0.950-730 0.950-730 0.000 TOTALS: 1											
Silver 17440-22-4 Die Attach 0.032 19.17 1,038 222 TAVE 10.08 10.094 19.17 1,038 222 TAVE 10.094 10.094 19.17 1,038 222 TAVE 10.094 10.094 10.097 13.803 7.700 2.59 (min) Total 10.094 10.094 10.097 13.803 7.700 2.59 (min) Total 10.094 10.094 10.094 10.097 13.803 7.700 2.59 (min) Total 10.094 10.094 10.094 10.094 10.097 13.803 7.700 2.59 (min) Total 10.094 10											1
Egory resin Trade Secret Die Attach 0.032 0.596 322 Floor Attach 0.004 0.078 42 Total Velocity Silcon 7440-21-3 Chip (Die) 0.005 1.358 37.00 (Die) 0.750 1.3580 7.500 1.555 30.00 (Die) 0.760 1.3580 7.500 1											1
Gamma-butyrolisctone 96-48-0 Die Attach 0.004 0.078 42 Total 190.00											1
Silicon 7440-57-5 Gold 7440-57-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-57-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 (Pold 1440-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pisting on external leads (prox) - More That Janeacate at 1507-02 1-14, 400-07-5 Pistin			Die Attach	0.004	0.078	42			Total	100 00	<u>4</u> 1
Tin 7440-31-5 Palego entermal state (1970-1981) - Nater Tan arreated at 1970 Cts 1 too 1 1.400 27.57							2 59	(mg) Total			
1.8507 g Total Mass 1.8507 g							2.55				0.14
1.8507 g Total Mass 1.8507 g								••			1
1,8507 g Total Mass Is semiconductor device and its homogeneous materials comply with EU Directive 2002/35/EC (End-of-Life Vehicles (ELV) Directive). Is semiconductor device and its homogeneous materials comply with EU Directive 2002/35/EC (End-of-Life Vehicles (ELV) Directive). Is semiconductor device and its homogeneous materials comply with EU Directive 2002/35/EC (End-of-Life Vehicles (ELV) Directive). In the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. In the above EU Directive No. the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if v. is not below the threshold of regulatory concern for any regulatory scheme world-vide. In the protective **Tubes** in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. **Window envelopes** used to hold the packing slip on the outer box and betain "reels" may be made from PVC plastic. **Total** In the protective **Tubes** in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. **Window envelopes** used to hold the packing slip on the outer box and betain "reels" may be made from PVC plastic. In the protective **Tubes** in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. **Window envelopes** used to hold the packing slip on the outer box and betain "reels" may be made from PVC plastic. In the protective **Tubes** in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. **Window envelopes** used to hold the packing slip on the outer box and betain specific product is shipped and beli		7440 01 0									1
In semiconductor device and its homogenous materials comply with EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive, EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive, EU Directive, Eu Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), EU Directive), EU Directive 2002/39/EC (RoHS Directive), E		1 9507			1,0001100	.,000,000		Carrina Datyrolaciono		-	<u>4</u>
irrective 2002/SS/EC (End-of-Life Vehicles (ELV) Directive). 13.88 Total (mg) Chip (Dia) % of Total Weight 0.75 ompliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if v. is not below the threshold of regulatory concern for any regulatory scheme world-wide. 13.88 Total (mg) Chip (Dia) % of Total Weight 0.75 ompliance with the process of the control of the post of the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if v. is a chemical substance is a been treated to the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if v. is a chemical substance,	his semiconductor device and its homogenous materials compl								. ota.	.00.00	*
a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Odding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ In protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and artain "reels" may be made from PVC plastic. Total O.56 (mg) Total Wire Bond % of Total Weight O.56 (mg) Total Doped Gold 7440-57-5 100 Doped Gold 7440-57-5 100. Total 100.00 Total Occepted Gold Total Total Occepted Gold Total Occepted Gold	inactive 2002/52/50 (Find of Life Vehicles (FLV) Directive)		1002/33/EC (INDIA Directive), EO Directive 2011/03/EO (INDI	HS Recast Dire	ctive) and with	EU	13.88	Total (mg)	Chip (Die)	% of Total Weight	0.75
ny, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Olding compounds used by Microchip meet the UL 94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and artain "reels" may be made from PVC plastic. Total 100.00 Doped Gold 7440-57-5 100 Total 100.00 Total Weight 0.03 Total 100.00 Plating on external leads (pins) - Matter Till parties are provided by Microchip's contained and fis or the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vells of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Understanding provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's undeations, sales order acknowledgement, and invoices. Total 100.00 Plating on external leads (pins) - Matter Till Januads (pins)	Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via int	ternal design control	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	HS Recast Dire	ctive) and with	EU	13.88	, 0,	,		0.75
icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's ucotations, sales order acknowledgement, and invoices. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's ucotations, sales order acknowledgement, and invoices. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information in Microchip's standard terms and conditions of sale. These are provided in Microchip's ucotat	compliance with the above EU Directives has been verified via int a chemical substance is absent from the list above, the chemical	al substance is NOT	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and	d, to the best of	Microchip Te	chnology	13.88	, 0,	7440-21-3	100	<u> </u>
icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in eier original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's untations, sales order acknowledgement, and invoices. Icrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	compliance with the above EU Directives has been verified via int a chemical substance is absent from the list above, the chemica acorporated's knowledge and belief as of the date of this docume ny, is not below the threshold of regulatory concern for any regul	al substance is NOT ent, there is no credi ulatory scheme work ubility standard for p	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide.	d, to the best of	Microchip Tec	chnology		Doped Silicon	7440-21-3 Total	100	
icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. Icrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or Independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	compliance with the above EU Directives has been verified via int a chemical substance is absent from the list above, the chemica acorporated's knowledge and belief as of the date of this docume ny, is not below the threshold of regulatory concern for any regulatory concern for any regulatory concern for any regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plass	al substance is NOT ent, there is no credi ulatory scheme work ibility standard for p stics/	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. I-wide. lastics. You can access the UL iQTM family of databases	i, to the best of intration of the to obtain a test	Microchip Tec chemical subs	chnology stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	compliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documeny, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flammat thus://ul.com/global/eng/pages/offerings/industries/chemicals/plasthe protective "tubes" in which the specific product is shipped alertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of incompleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these parts	al substance is NOT ent, there is no credi alatory scheme work biblity standard for p stics/ re made from polyvia is form concerning its knowledge and be seen compiled based dd some information is and the average we	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases in a constant of the control of the co	i, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate gy incorporate and raw mater	Microchip Techemical substreport at galip on the outgoing semiconductor d cannot guaraterial suppliers. In suppliers. In	chnology stance, if atter box and r devices in antee the ers. Supplier offormation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.03
Total 100.00	compliance with the above EU Directives has been verified via inti- a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume ny, is not below the threshold of regulatory concern for any regu- folding compounds used by Microchip meet the UL94 V0 flamma titp://ul.com/global/eng/pages/offerings/industries/chemicals/plas the protective "tubes" in which the specific product is shipped al- ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the neir original packing materials is true and correct to the best of it ompleteness and accuracy of data in this form because it has be nformation is often protected from disclosure as trade secrets ar is provided only as estimates of the average weight of these parts evels of dopants, metals, and non-metal materials contained with flicrochip Technology Incorporated does not provide any warrant	al substance is NOT ent, there is no credi alatory scheme work biblity standard for p stics/ re made from polyvia is form concerning is to knowledge and be seen compiled based do some information is and the average we in silicon devices (s	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases in a constant of the control of the co	I, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate by ided by raw and raw mater These estimate tion. The exclution of the second intrational raw mater these estimate tion. The exclution of the second intrational raw mater and raw mater these estimates and raw materials and raw mater	Microchip Techemical substreport at g slip on the outsemiconductor d cannot guaraterial suppliers. It is do not includistive, limited p	chnology stance, if after box and r devices in antee the ers. Supplier formation de trace	0.56	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 100.00 % of Total Weight 100 100.00	0.03
	ompliance with the above EU Directives has been verified via int a chemical substance is absent from the list above, the chemica corporated's knowledge and belief as of the date of this documeny, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flamma ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plathe protective "tubes" in which the specific product is shipped an ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the eir original packing materials is true and correct to the best of it ompleteness and accuracy of data in this form because it has beformation is often protected from disclosure as trade secrets are a provided only as estimates of the average weight of these parts evels of dopants, metals, and non-metal materials contained with discrochip Technology Incorporated does not provide any warrant arranties provided by Microchip Technology Incorporated and it uotations, sales order acknowledgement, and invoices.	al substance is NOT ent, there is no credi alatory scheme work biblity standard for p stics/ re made from polyvir is form concerning s ts knowledge and be een compiled based ald some information s and the average we in silicon devices (s ty, express or implie ts subsidiaries are co	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases anyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lilef, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Tilicon IC) in the finished parts. d, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	d, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate vided by raw in and raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect	Microchip Techemical substreport at g slip on the outget of d cannot guaraterial supplicial suppliers. It is do not include sive, limited p a provided in Matter of the provid	chnology stance, if atter box and r devices in antee the erroduct ficrochip's	0.56	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00	0.03

PG 24 PDIP 10:59 AM : 8/29/2013

MICROCHIP Semiconductor Device Typ	e: Pand PI 28 (Lead) P	DIP (Wide Outline600") (Q2 / QB)		ation Base oper Alloy (•		•	geneous Materials: g. pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
·	, ,	"Contained In"	% Total			3245.23	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number 60676-86-0	Sub-Component	Weight	mg/part	ppm	0240.20	Fused Silica	60676-86-0	72.00	75.5
Fused Silica Metal Hydro Oxide	Trade Secret	Mold Compound Mold Compound	57.456 8.778	2336.563 356.975	574,560 87,780		Metal Hydro Oxide	Trade Secret	72.00 11.00	
Epoxy Resin	Trade Secret	Mold Compound	5.586	227.166	55,860		Epoxy Resin	Trade Secret	7.00	
Phenol Resin	Trade Secret	Mold Compound	5.586	227.166	55,860		Phenol Resin	Trade Secret	7.00	
SiO2	14808-60-7	Mold Compound	1.995	81.131	19,950		SiO2	14808-60-7	2.50	
Carbon Black	1333-86-4	Mold Compound	0.399	16.226	3,990		Carbon Black	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	9.984	406.006	99,837			Total	100.00	
Iron	7439-89-6	Lead Frame	0.246	9.987	2,456	424.97	(mg) Total	Lead Frame	% of Total Weight	10.45
Silver	7440-22-4	Lead Frame	0.199	8.096	1,991		Copper	7440-50-8	95.54	
Zinc Phosphorous	7440-66-6 7723-14-0	Lead Frame Lead Frame	0.013	0.531 0.351	131 86		Iron Silver	7439-89-6 7440-22-4	2.35 1.91	
Polyimide	25038-81-7	Lead Frame Lead Frame	0.009	0.351	215		Zinc	7440-22-4	1.91 0.13	
Poly - ethylene – terephthalate	25038-59-9	Lead Frame	0.022	0.773	190		Phosphorous	7723-14-0	0.08	
NBR	9003-18-3	Lead Frame	0.004	0.142	35		Позрногоиз	Total	100.00	
Bismaleimide	79922-55-7	Lead Frame	0.003	0.122	30	2.03	(mg) Total	Lead Lock Tape	% of Total Weight	0.05
Phenol resin	28453-20-5 / 9016-83-5	Lead Frame	0.003	0.122	30	2.03	Polyimide	25038-81-7	43.00	0.03
Silver	7440-22-4	Die Attach	0.550	22.375	5,502		Poly - ethylene - terephthalate		38.00	
Epoxy Resin	9003-36-5	Die Attach	0.110	4.474	1,100		NBR	9003-18-3	7.00	
Diluent	3101-60-8	Die Attach	0.055	2.236	550		Bismaleimide	79922-55-7	6.00	
Phenolic hardener	Trade secret	Die Attach	0.022	0.894	220		Phenol resin	28453-20-5 / 9016-83-5	6.00	
Amine type hardener	827-43-0	Die Attach	0.011	0.448	110			Total	100.00	
Dicyandiamide	461-58-5	Die Attach	0.002	0.073	18	30.50	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	305.003	75,000		Silver	7440-22-4	73	
Gold	7440-57-5	Wire Bond	0.200	8.133	2,000		Epoxy Resin	9003-36-5	15	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	50.834	12,500		Diluent	3101-60-8	7	
		TOTALS:	100.000	4,066.700	1,000,000		Phenolic hardener	Trade secret	3	
	4.0667	g Total Mass					Amine type hardener	827-43-0	1	
his semiconductor device and its homogenous materials compl	y with EU Directive 2002/95/E	C (RoHS Directive), EU Directive 2011/65/EU (RoHS	Recast Direc	tive) and wit	h EU		· · · · · ·			
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		, , , , , , , , , , , , , , , , , , , ,		•			Dicyandiamide	461-58-5	0	
ompliance with the above EU Directives has been verified via in	tornal design controls suppl	ior declarations, and for analytical tost data						Total	100.00	!
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum ny, is not below the threshold of regulatory concern for any reg	al substance is NOT an inter ent, there is no credible reas	tional ingredient in the semiconductor device and,				305.00	Total (mg)	Chip (Die)	% of Total Weight	7.5
olding compounds used by Microchip meet the UL94 V0 flamma		You can access the III iOTM family of databases to							1	
ttp://ul.com/global/eng/pages/offerings/industries/chemicals/pla	stics/	ou our access the of rethin family of databases to	obtain a test	report at			Doped Silicon	7440-21-3	100	
		,		•	outer box		Doped Silicon	7440-21-3 Total	100	
ttp://ul.com/global/eng/pages/offerings/industries/chemicals/pla he protective "tubes" in which the specific product is shipped a	re made from polyvinyl chlor his form concerning substan- its knowledge and belief, as a een compiled based on the r- secrets and some informatio of these parts and the averag	ide (PVC) plastic. "Window envelopes" used to hole tes restricted by RoHS in Microchip Technology Inc of the date listed in this form. Microchip Technology on may not have been provided by subcontract asset e weight of anticipated significant toxic metals com	d the packing corporated's s / Incorporated ided by raw m mblers and ra	slip on the c emiconductor I cannot gua aterial suppl w material s	or devices in rantee the iers. uppliers.	8.13	Doped Silicon (mg) Total			0.2
ttp://ul.com/global/eng/pages/offerings/industries/chemicals/pla he protective "tubes" in which the specific product is shipped a nd certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has be upplier information is often protected from disclosure as trade formation is provided only as estimates of the average weight of	re made from polyvinyl chlor his form concerning substan- its knowledge and belief, as a een compiled based on the ri- secrets and some informatio of these parts and the averag- contained within silicon devi- ty, express or implied, with r	ide (PVC) plastic. "Window envelopes" used to hole these restricted by RoHS in Microchip Technology Inc of the date listed in this form. Microchip Technology tages provided in Material Safety Data Sheets provi to may not have been provided by subcontract asset e weight of anticipated significant toxic metals com tes (silicon IC) in the finished parts. espect to the information provided in this declaration	d the packing corporated's s y Incorporated ided by raw m mblers and ra uponents. The	slip on the commence of the conductor of the commence of the c	or devices in rantee the iers. uppliers. do not	8.13	<u> </u>	Total	100.00	0.2
trp://ul.com/global/eng/pages/offerings/industries/chemicals/plathe protective "tubes" in which the specific product is shipped and certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in the ieir original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has bupplier information is often protected from disclosure as trade formation is provided only as estimates of the average weight oclude trace levels of dopants, metals, and non-metal materials icrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and incorporated incorporated and incorporated incorporated and incorporated inco	re made from polyvinyl chlor his form concerning substan- its knowledge and belief, as a een compiled based on the ra- secrets and some informatio of these parts and the averag- contained within silicon devi- ty, express or implied, with ra- ts subsidiaries are contained less to Material Content Decla	ide (PVC) plastic. "Window envelopes" used to hole the restricted by RoHS in Microchip Technology Inc of the date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets provi on may not have been provided by subcontract asset weight of anticipated significant toxic metals com ces (silicon IC) in the finished parts. espect to the information provided in this declaratic in Microchip's standard terms and conditions of sa rations and shall not be liable for any damages, dire	d the packing corporated's s / Incorporated ided by raw m mblers and rapponents. The exclusible. These are lect or indirect	slip on the of emiconductal cannot gua aterial supply w material s se estimates sive, limited in provided in	or devices in rantee the iers. uppliers. do not product Microchip's	8.13	(mg) Total	Total Wire Bond	100.00 % of Total Weight	0.2
trp://ul.com/global/eng/pages/offerings/industries/chemicals/plathe protective "tubes" in which the specific product is shipped and certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has bupplier information is often protected from disclosure as trade information is provided only as estimates of the average weight of clude trace levels of dopants, metals, and non-metal materials icrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and i uotations, sales order acknowledgement, and invoices. icrochip disclaims any duty to notify users of updates or changtherwise, suffered by users or third parties as a result of the us	re made from polyvinyl chlor his form concerning substan- its knowledge and belief, as a een compiled based on the ra- secrets and some informatio of these parts and the averag- contained within silicon devi- ty, express or implied, with ra- ts subsidiaries are contained less to Material Content Decla	ide (PVC) plastic. "Window envelopes" used to hole the restricted by RoHS in Microchip Technology Inc of the date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets provi on may not have been provided by subcontract asset weight of anticipated significant toxic metals com ces (silicon IC) in the finished parts. espect to the information provided in this declaratic in Microchip's standard terms and conditions of sa rations and shall not be liable for any damages, dire	d the packing corporated's s / Incorporated ided by raw m mblers and rapponents. The exclusible. These are lect or indirect	slip on the of emiconductal cannot gua aterial supply w material s se estimates sive, limited in provided in	or devices in rantee the iers. uppliers. do not product Microchip's	8.13 50.83	(mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight 100.00 100.00 % of Total Weight	0.2
tp://ul.com/global/eng/pages/offerings/industries/chemicals/plane protective "tubes" in which the specific product is shipped add certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has bupplier information is often protected from disclosure as trade information is provided only as estimates of the average weight occurated in the interval of the average weight occurated levels of dopants, metals, and non-metal materials incrochip Technology Incorporated does not provide any warrang arranties provided by Microchip Technology Incorporated and inotations, sales order acknowledgement, and invoices. icrochip disclaims any duty to notify users of updates or chang herwise, suffered by users or third parties as a result of the us	re made from polyvinyl chlor his form concerning substan- its knowledge and belief, as a een compiled based on the ra- secrets and some informatio of these parts and the averag- contained within silicon devi- ty, express or implied, with ra- ts subsidiaries are contained less to Material Content Decla	ide (PVC) plastic. "Window envelopes" used to hole the restricted by RoHS in Microchip Technology Inc of the date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets provi on may not have been provided by subcontract asset weight of anticipated significant toxic metals com ces (silicon IC) in the finished parts. espect to the information provided in this declaratic in Microchip's standard terms and conditions of sa rations and shall not be liable for any damages, dire	d the packing corporated's s / Incorporated ided by raw m mblers and rapponents. The exclusible. These are lect or indirect	slip on the of emiconductal cannot gua aterial supply w material s se estimates sive, limited in provided in	or devices in rantee the iers. uppliers. do not product Microchip's		(mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100	

P PI 28 PDIP 10:59 AM : 8/29/2013

MICROCHIP Semiconductor Device	ce Type: PHE 32 (Lead) PDIP	(Wide Outline - 600°) (P2)		nation Base opper Alloy (ogeneous Materials: .g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance		"Contained In" Sub-Component	% Total Weight			4478.48	(mg) Total	Mold Compound	% ot Total Weight	85.67
	CAS Number 60676-86-0	•	72.820	mg/part	ppm		Silica, vitreous	60676-86-0	85.00	1
Silica, vitreous Epoxy Resin	Trade Secret	Mold Compound Mold Compound	72.820 5.247	3806.712 274.307	728,195 52,473		Epoxy Resin	Trade Secret	85.00 6.13	
Phenolic Resin	Trade Secret	Mold Compound	5.247	274.307	52,473		Phenolic Resin	Trade Secret	6.13	1
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	2.099	109.723	20,989		Epoxy, Cresol Novolac	29690-82-2	2.45	1
Carbon Black	1333-86-4	Mold Compound	0.257	13,435	2,570		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	12.783	668,240	127.829			Total	100.00	4
Iron	7439-89-6	Lead Frame	0.314	16.437	3,144	699.45	(mg) Total	Lead Frame	% of Total Weight	13.38
Silver	7440-22-4	Lead Frame	0.255	13.325	2.549		Copper	7440-50-8	95.54	1
Zinc	7440-66-6	Lead Frame	0.017	0.874	167		Iron	7439-89-6	2.35	1
Phosphorous	7723-14-0	Lead Frame	0.011	0.577	110		Silver	7440-22-4	1.91	1
Silver (Ag)	7440-22-4	Die Attach	0.128	6.691	1,280		Zinc	7440-66-6	0.13	1
Epoxy Resin	Trade Secret	Die Attach	0.027	1.422	272		Phosphorous	7723-14-0	0.08	
Copper (Cu)	7440-50-8	Die Attach	0.005	0.251	48			Total	100.00	_
Doped Silicon	7440-21-3	Chip (Die)	0.220	11.501	2,200	8.36	(mg) Total	Die Attach	% of Total Weight	0.16
Doped Gold	7440-57-5	Wire Bond	0.030	1.568	300		Silver (Ag)	7440-22-4	80.00	
Tin	7440-31-5 Plating on	external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.540	28.229	5,400		Epoxy Resin	Trade Secret	17.00	
		TOTALS:	100.000	5,227.600	1,000,000		Copper (Cu)	7440-50-8	3.00	
emiconductor device and its homogenous materials ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified			S Recast Dire	ctive) and wit	h EU	11.50	(mg) Total Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	0.22
hemical substance is absent from the list above, the c porated's knowledge and belief as of the date of this of is not below the threshold of regulatory concern for ar ing compounds used by Microchip meet the UL94 V0 f	document, there is no credible reason ny regulatory scheme world-wide. flammability standard for plastics. Yo	to believe that the unavoidable impurity concern	tration of the	chemical sub		1.57	(mg) Total	Total Wire Bond	100.00	
/ul.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic.		e (PVC) plastic. "Window envelopes" used to ho	ld the packing	g slip on the o	uter box and		Doped Gold	7440-57-5	100.00	
ochip Technology Incorporated believes the informatio original packing materials is true and correct to the be pleteness and accuracy of data in this form because it iller information is often protected from disclosure as mation is provided only as estimates of the average we de trace levels of dopants, metals, and non-metal mate	est of its knowledge and belief, as of has been compiled based on the ran- trade secrets and some information r eight of these parts and the average	the date listed in this form. Microchip Technolog ges provided in Material Safety Data Sheets prov nay not have been provided by subcontract asse weight of anticipated significant toxic metals con	y Incorporate vided by raw r emblers and r	d cannot guar naterial suppl aw material su	rantee the iers. uppliers.			Total	100.00	
ochip Technology Incorporated does not provide any v ranties provided by Microchip Technology Incorporated tations, sales order acknowledgement, and invoices.						28.23	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	0.54
ochip disclaims any duty to notify users of updates or rwise, suffered by users or third parties as a result of t is Certificate of Compliance for semiconductor produc	the users' reliance on the information						Tin	7440-31-5	100.00	
						5,227.60	0	Total	100.00	100.0

PHE 32 PDIP 11:00 AM: 8/29/2013

ICROCHIP Semiconductor Device T	vne: Dani Di 40 a z a Di	DIP (Wide Outline600") (S2 / SL)		nation Base A oper Alloy (C				geneous Materials: . pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device 1	ype. Fand FL 40 (Lead) FI	"Contained In"	% Total			5407.00	() T-1-1	Mald Comment	0/ -/ T-/-134/-1-b/	70.0
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	5187.00	(mg) Total	Mold Compound	% ot Total Weight	79.8
Fused Silica	60676-86-0	Mold Compound	57.456 8.778	3734.640	574,560		Fused Silica Metal Hydro Oxide	60676-86-0 Trade Secret	72.00 11.00	
Metal Hydro Oxide Epoxy Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	5.778 5.586	570.570 363.090	87,780 55.860		Epoxy Resin	Trade Secret	7.00	
Phenol Resin	Trade Secret	Mold Compound	5.586	363.090	55,860		Phenol Resin	Trade Secret	7.00	
SiO2	14808-60-7	Mold Compound	1.995	129.675	19,950		SiO2	14808-60-7	2.50	
Carbon Black	1333-86-4	Mold Compound	0.399	25.935	3,990		Carbon Black	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	9.984	648.938	99,837			Total	100.00	
Iron	7439-89-6	Lead Frame	0.246	15.962	2,456	679.25	(mg) Total	Lead Frame	% of Total Weight	10.45
Silver	7440-22-4 7440-66-6	Lead Frame	0.199 0.013	12.940 0.849	1,991		Copper	7440-50-8 7439-89-6	95.54 2.35	
Zinc Phosphorous	7723-14-0	Lead Frame Lead Frame	0.013	0.849	131 86		Iron Silver	7439-89-6	1.91	
Polyimide	25038-81-7	Lead Frame	0.009	1.398	215		Zinc	7440-22-4	0.13	
Poly - ethylene – terephthalate	25038-59-9	Lead Frame	0.019	1.235	190		Phosphorous	7723-14-0	0.08	
NBR	9003-18-3	Lead Frame	0.004	0.228	35			Total	100.00	l ·
Bismaleimide	79922-55-7	Lead Frame	0.003	0.195	30	3.25	(mg) Total	Lead Lock Tape	% of Total Weight	0.05
Phenol resin	28453-20-5 / 9016-83-5	Lead Frame	0.003	0.195	30		Polyimide	25038-81-7	43.00	
Silver	7440-22-4	Die Attach	0.550	35.763	5,502		Poly - ethylene - terephthalate	25038-59-9	38.00	
Epoxy Resin	9003-36-5	Die Attach	0.110	7.152	1,100		NBR	9003-18-3	7.00	
Diluent	3101-60-8	Die Attach	0.055	3.573	550		Bismaleimide Phenol resin	79922-55-7 28453-20-5 / 9016-83-5	6.00 6.00	
Phenolic hardener Amine type hardener	Trade secret 827-43-0	Die Attach Die Attach	0.022 0.011	1.428 0.717	220 110		Phenol resin	28453-20-5 / 9016-83-5 Total	6.00 100.00	
Dicyandiamide	461-58-5	Die Attach	0.002	0.717	18	48.75	(mg) Total	Die Attach	% of Total Weight	0.75
Dioyandiamide	401 00 0	Die / Macin	0.002	0.117	10	40.73	(ilig) rotal	Die Attach	% Of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	487.500	75,000		Silver	7440-22-4	73	
Gold	7440-57-5	Wire Bond	0.200	13.000	2,000		Epoxy Resin	9003-36-5	15	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	81.250	12,500		Diluent	3101-60-8	7	
Tin		TOTALS:	1.250 100.000		12,500 1,000,000		Diluent Phenolic hardener	3101-60-8 Trade secret	7 3	
	6.5000	TOTALS: g Total Mass	100.000	81.250 6,500.000	1,000,000		Diluent	3101-60-8	7	
semiconductor device and its homogenou	6.5000 s materials comply with EU Direction	TOTALS:	100.000	81.250 6,500.000	1,000,000		Diluent Phenolic hardener Amine type hardener	3101-60-8 Trade secret 827-43-0	7 3 1	
semiconductor device and its homogenou EU Directive 2002/53/EC (End-of-Life Vehic	6.5000 s materials comply with EU Directles (ELV) Directive).	TOTALS: g Total Mass	100.000 011/65/EU (RoH	81.250 6,500.000	1,000,000		Diluent Phenolic hardener	3101-60-8 Trade secret	7 3	
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehic eliance with the above EU Directives has be emical substance is absent from the list a	6.5000 s materials comply with EU Directive). een verified via internal design cubove, the chemical substance is ef as of the date of this documer	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical s NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the	100.000 011/65/EU (RoH test data. ctor device and	81.250 6,500.000 S Recast Direct	1,000,000 ctive) and	487.50	Diluent Phenolic hardener Amine type hardener	3101-60-8 Trade secret 827-43-0 461-58-5	7 3 1	7.5
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehic oliance with the above EU Directives has be nemical substance is absent from the list a nology Incorporated's knowledge and belic nemical substance, if any, is not below the	6.5000 s materials comply with EU Directive). een verified via internal design of above, the chemical substance is ef as of the date of this document threshold of regulatory concerned UL94 V0 flammability standard	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical s NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the	100.000 011/65/EU (RoH test data. ctor device and unavoidable im	81.250 6,500.000 S Recast Directly, to the best opurity concentration	1,000,000 ctive) and f Microchip tration of	487.50	Diluent Phenolic hardener Amine type hardener Dicyandiamide	3101-60-8 Trade secret 827-43-0 461-58-5 Total	7 3 1 0 100.00	7.5
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehicoliance with the above EU Directives has be nemical substance is absent from the list a nology Incorporated's knowledge and belinemical substance, if any, is not below the ng compounds used by Microchip meet th /ul.com/global/eng/pages/offerings/industrations.	6.5000 s materials comply with EU Directive). een verified via internal design of the date of this document threshold of regulatory concerned UL94 V0 flammability standardies/chemicals/plastics/	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical s NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the n for any regulatory scheme world-wide.	100.000 011/65/EU (RoH test data. ctor device and unavoidable im	81.250 6,500.000 S Recast Directly, to the best of purity concentro oobtain a tes	1,000,000 ctive) and f Microchip tration of	487.50	Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg)	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die)	7 3 1 0 100.00	7.5
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehice Indiance with the above EU Directives has be nemical substance is absent from the list a nology Incorporated's knowledge and believemical substance, if any, is not below the nig compounds used by Microchip meet the full.com/global/eng/pages/offerings/industrotective "tubes" in which the specific probox and certain "reels" may be made from this Technology Incorporated believes the conductor devices in their original packing nology Incorporated cannot guarantee the y Data Sheets provided by raw material su ded by subcontract assemblers and raw material su	6.5000 s materials comply with EU Directive). een verified via internal design of the date of this document threshold of regulatory concern the UL94 V0 flammability standard ries/chemicals/plastics/ boduct is shipped are made from in PVC plastic. e information in this form concern materials is true and correct to completeness and accuracy of oppoliers. Supplier in formation is contertial suppliers. Information is contertial suppliers. Information is contertial suppliers.	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical is NOT an intentional ingredient in the semicondunt, there is no credible reason to believe that the in for any regulatory scheme world-wide. If or plastics. You can access the UL iQTM family	100.000 011/65/EU (RoH test data. ctor device and unavoidable im y of databases t pes" used to h p Technology I tte listed in this ased on the ran and some infor t of these parts	81.250 6,500.000 S Recast Directly to the best of purity concently	1,000,000 ctive) and f Microchip tration of t report at g slip on the ip in Material ot have been ge weight of	487.50 13.00	Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg)	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die)	7 3 1 0 100.00 % of Total Weight	7.5
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehicoliance with the above EU Directives has be nemical substance is absent from the list a nology Incorporated's knowledge and believe mical substance, if any, is not below the nig compounds used by Microchip meet the full.com/global/eng/pages/offerings/industrotective "tubes" in which the specific probox and certain "reels" may be made fron chip Technology Incorporated believes the conductor devices in their original packing nology Incorporated cannot guarantee the potata Sheets provided by raw material suited by subcontract assemblers and raw material single for the proposed significant toxic metals components (silicon IC) in the finished parts.	6.5000 s materials comply with EU Directive). een verified via internal design of above, the chemical substance is ef as of the date of this document threshold of regulatory concerns to UL94 V0 flammability standardies/chemicals/plastics/oduct is shipped are made from an PVC plastic. e information in this form concernaterials is true and correct to completeness and accuracy of ppliers. Supplier information is a laterial suppliers. Information is sometimes are stimulated and correct to concern the completeness and accuracy of ppliers. Supplier information is sometimes are stimulated to not include the concern that is the concern that is suppliers. Information is sometimes are stimulated and correct and cor	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical is NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the n for any regulatory scheme world-wide. If for plastics. You can access the UL iQTM family polyvinyl chloride (PVC) plastic. "Window enveloring substances restricted by RoHS in Microchi the best of its knowledge and belief, as of the da data in this form because it has been compiled be often protected from disclosure as trade secrets provided only as estimates of the average weigh the trace levels of dopants, metals, and non-metal implied, with respect to the information provided it its subsidiaries are contained in Microchip's sta	100.000 011/65/EU (RoH test data. ctor device and unavoidable im y of databases to pes" used to he p Technology I te listed in this ased on the ran and some infor t of these parts materials conta	81.250 6,500.000 S Recast Directly to the best of purity concently to obtain a test of the packing many near the average provided mation may near the averagined within sition. The exclusion.	1,000,000 ctive) and f Microchip tration of t report at g slip on the ip in Material ot have been ge weight of licon usive,		Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg) Doped Silicon	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die) 7440-21-3	7 3 1 0 100.00 % of Total Weight 100	
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehice Diance with the above EU Directives has be nemical substance is absent from the list a nology Incorporated's knowledge and believes the nemical substance, if any, is not below the nemical substance; in which the specific probox and certain "reels" may be made from chip Technology Incorporated believes the conductor devices in their original packing nology Incorporated cannot guarantee the y Data Sheets provided by raw material suded by subcontract assemblers and raw may pated significant toxic metals components established parts. Schip Technology Incorporated does not pind product warranties provided by Microche are provided in Microchip's quotations, schip disclaims any duty to notify users of	6.5000 s materials comply with EU Directive). een verified via internal design of the date of this document threshold of regulatory concerns of the UL94 V0 flammability standardies/chemicals/plastics/ boduct is shipped are made from a PVC plastic. e undertials is true and correct to completeness and accuracy of oppliers. Supplier information is caterial suppliers. Information is safeties. These estimates do not includivovide any warranty, express or ip Technology Incorporated and ales order acknowledgement, at updates or changes to Material or third parties as a result of the	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical is NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the n for any regulatory scheme world-wide. If for plastics. You can access the UL iQTM family polyvinyl chloride (PVC) plastic. "Window enveloring substances restricted by RoHS in Microchi the best of its knowledge and belief, as of the da data in this form because it has been compiled be often protected from disclosure as trade secrets provided only as estimates of the average weigh le trace levels of dopants, metals, and non-metal implied, with respect to the information provided it its subsidiaries are contained in Microchip's sta not invoices. Content Declarations and shall not be liable for a users' reliance on the information in Material Coi	100.000 011/65/EU (RoH test data. ctor device and unavoidable im y of databases to pes" used to he p Technology I te listed in this ased on the ran and some infor t of these parts materials conta l in this declara undard terms an ny damages, di	81.250 6,500.000 S Recast Directory I, to the best of purity concentrologo obtain a test of the packin and the packin may not on and the averationed within sittion. The excludic conditions of the conditions of	1,000,000 ctive) and f Microchip tration of t report at g slip on the lip in Material to have been ge weight of licon usive, of sale.		Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond	7 3 1 1 0 100.00 % of Total Weight 100 100.00 % of Total Weight	
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehicoliance with the above EU Directives has be memical substance is absent from the list a nology Incorporated's knowledge and beliemenical substance, if any, is not below the ng compounds used by Microchip meet the full.com/global/eng/pages/offerings/industroctive "tubes" in which the specific probox and certain "reels" may be made fron the full conductor devices in their original packing toology Incorporated believes to chip Technology Incorporated believes to pata Sheets provided by raw material su ded by subcontract assemblers and raw mated significant toxic metals components es (silicon IC) in the finished parts. Chip Technology Incorporated does not provided in Microchip's quotations, so chip disclaims any duty to notify users of equential or otherwise, suffered by users of equential or otherwise, suffered by users of	6.5000 s materials comply with EU Directive). een verified via internal design of the date of this document threshold of regulatory concerns of the UL94 V0 flammability standardies/chemicals/plastics/ boduct is shipped are made from a PVC plastic. e undertials is true and correct to completeness and accuracy of oppliers. Supplier information is caterial suppliers. Information is safeties. These estimates do not includivovide any warranty, express or ip Technology Incorporated and ales order acknowledgement, at updates or changes to Material or third parties as a result of the	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical is NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the n for any regulatory scheme world-wide. If for plastics. You can access the UL iQTM family polyvinyl chloride (PVC) plastic. "Window enveloring substances restricted by RoHS in Microchi the best of its knowledge and belief, as of the da data in this form because it has been compiled be often protected from disclosure as trade secrets provided only as estimates of the average weigh le trace levels of dopants, metals, and non-metal implied, with respect to the information provided it its subsidiaries are contained in Microchip's sta not invoices. Content Declarations and shall not be liable for a users' reliance on the information in Material Coi	100.000 011/65/EU (RoH test data. ctor device and unavoidable im y of databases to pes" used to he p Technology I te listed in this ased on the ran and some infor t of these parts materials conta l in this declara undard terms an ny damages, di	81.250 6,500.000 S Recast Directory I, to the best of purity concentrologo obtain a test of the packin and the packin may not on and the averationed within sittion. The excludic conditions of the conditions of	1,000,000 ctive) and f Microchip tration of t report at g slip on the lip in Material to have been ge weight of licon usive, of sale.		Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond	7 3 1 1 0 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	
semiconductor device and its homogenous EU Directive 2002/53/EC (End-of-Life Vehicoliance with the above EU Directives has be memical substance is absent from the list a nology Incorporated's knowledge and beliemenical substance, if any, is not below the ng compounds used by Microchip meet the full.com/global/eng/pages/offerings/industroctive "tubes" in which the specific probox and certain "reels" may be made fron the full conductor devices in their original packing toology Incorporated believes to chip Technology Incorporated believes to pata Sheets provided by raw material su ded by subcontract assemblers and raw mated significant toxic metals components es (silicon IC) in the finished parts. Chip Technology Incorporated does not provided in Microchip's quotations, so chip disclaims any duty to notify users of equential or otherwise, suffered by users of equential or otherwise, suffered by users of	6.5000 s materials comply with EU Directive). een verified via internal design of the date of this document threshold of regulatory concerns of the UL94 V0 flammability standardies/chemicals/plastics/ boduct is shipped are made from a PVC plastic. e undertials is true and correct to completeness and accuracy of oppliers. Supplier information is caterial suppliers. Information is safeties. These estimates do not includivovide any warranty, express or ip Technology Incorporated and ales order acknowledgement, at updates or changes to Material or third parties as a result of the	TOTALS: q Total Mass ctive 2002/95/EC (RoHS Directive), EU Directive 2 controls, supplier declarations, and /or analytical is NOT an intentional ingredient in the semicondu nt, there is no credible reason to believe that the n for any regulatory scheme world-wide. If for plastics. You can access the UL iQTM family polyvinyl chloride (PVC) plastic. "Window enveloring substances restricted by RoHS in Microchi the best of its knowledge and belief, as of the da data in this form because it has been compiled be often protected from disclosure as trade secrets provided only as estimates of the average weigh le trace levels of dopants, metals, and non-metal implied, with respect to the information provided it its subsidiaries are contained in Microchip's sta not invoices. Content Declarations and shall not be liable for a users' reliance on the information in Material Coi	100.000 011/65/EU (RoH test data. ctor device and unavoidable im y of databases to pes" used to he p Technology I te listed in this ased on the ran and some infor t of these parts materials conta l in this declara undard terms an ny damages, di	81.250 6,500.000 S Recast Directory I, to the best of purity concentrologo obtain a test of the packin and the packin may not on and the averationed within sittion. The excludic conditions of the conditions of	1,000,000 ctive) and f Microchip tration of t report at g slip on the lip in Material to have been ge weight of licon usive, of sale.	13.00	Diluent Phenolic hardener Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total Doped Gold	3101-60-8 Trade secret 827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	7 3 1 1 0 100.00 % of Total Weight 100 100.00 100.00	0.2

P PL 28 PDIP 11:00 AM : 8/29/2013

MICROCHIP Semiconductor Device T	· vpe: SP 28 (Lead) SPD	IP .300" (M3/MD)		nation Base A oper Alloy (C	•		•	ogeneous Materials: .g. pc boards, displays	·)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In" Sub-Component	% Total Weight	un sulm a ut		1665.83	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance Fused Silica	CAS Number 60676-86-0	Mold Compound	57.456	mg/part 1199.394	ppm 574,560		Fused Silica	60676-86-0	72.00	
Metal Hydro Oxide	Trade Secret	Mold Compound	8.778	183.241	87,780		Metal Hydro Oxide	Trade Secret	11.00	
Epoxy Resin	Trade Secret	Mold Compound	5.586	116.608	55,860		Epoxy Resin	Trade Secret	7.00	
Phenol Resin	Trade Secret	Mold Compound	5.586	116.608	55,860		Phenol Resin	Trade Secret	7.00	
SiO2	14808-60-7	Mold Compound	1.995	41.646	19,950		SiO2	14808-60-7	2.50	
Carbon Black	1333-86-4	Mold Compound	0.399	8.329	3,990		Carbon Black	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	9.984	208.409	99,837			Total		
Iron	7439-89-6	Lead Frame	0.246	5.126	2,456	218.14	(mg) Total	Lead Frame	% of Total Weight	10.45
Silver	7440-22-4	Lead Frame	0.199	4.156	1,991		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.273	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.180	86		Silver	7440-22-4	1.91	
Polyimide Poly - ethylene – terephthalate	25038-81-7 25038-59-9	Lead Frame	0.022	0.449	215 190		Zinc	7440-66-6	0.13	
Poly - ethylene – terephthalate NBR	25038-59-9 9003-18-3	Lead Frame Lead Frame	0.019	0.397	190 35		Phosphorous	7723-14-0 Total	0.08 100.00	
NBR Bismaleimide	79922-55-7	Lead Frame Lead Frame	0.004	0.073	30	1.04	(mg) Total		% of Total Weight	0.05
Phenol resin	28453-20-5 / 9016-83-5	Lead Frame	0.003	0.063	30	1.04	(mg) Total	Lead Lock Tape		0.05
Silver	7440-22-4	Die Attach	0.550	11.485	5,502		Polyimide Poly - ethylene – terephthala	25038-81-7 te 25038-59-9	43.00 38.00	
Epoxy Resin	9003-36-5	Die Attach	0.330	2.297	1,100		NRR	9003-18-3	7.00	
Diluent	3101-60-8	Die Attach	0.055	1.148	550		Bismaleimide	79922-55-7	6.00	
Phenolic hardener	Trade secret	Die Attach	0.022	0.459	220		Phenol resin	28453-20-5 / 9016-83-5	6.00	
Amine type hardener	827-43-0	Die Attach	0.011	0.230	110	L		Total	100.00	
Dicyandiamide	461-58-5	Die Attach	0.002	0.038	18	15.66	(mg) Total	Die Attach	% of Total Weight	0.75
•						10.00	(,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Silicon	7440-21-3	Chip (Die)	7.500	156.563	75,000		Silver	7440-22-4	73	
Gold	7440-57-5	Wire Bond	0.200	4.175	2,000		Epoxy Resin	9003-36-5	15	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	26.094	12,500		Diluent	3101-60-8	7	
		TOTALS:								
			100.000	2,087.500	1,000,000		Phenolic hardener	Trade secret	3	
		g Total Mass			, ,		Phenolic hardener Amine type hardener	Trade secret 827-43-0	3 1	
nis semiconductor device and its homogenous materials con		g Total Mass			, ,		Amine type hardener	827-43-0		
nis semiconductor device and its homogenous materials con rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		g Total Mass			, ,					
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 2002/95/	q Total Mass /EC (RoHS Directive), EU Directive 2011/65/EU (R			, ,		Amine type hardener	827-43-0		
	nply with EU Directive 2002/95/ a internal design controls, supp mical substance is NOT an inte ument, there is no credible rea	q Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), EU Directive 2011/65/EU (Robie declarations, and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con	toHS Recast Dir	ective) and wi	th EU	156.56	Amine type hardener	827-43-0 461-58-5	0	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via In a chemical substance is absent from the list above, the cher Corporated's knowledge and belief as of the date of this doce	mply with EU Directive 2002/95/ a internal design controls, supprinical substance is NOT an interument, there is no credible rearegulatory scheme world-wide. mability standard for plastics.	q Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con	toHS Recast Dir and, to the best centration of th	rective) and wi	th EU	156.56	Amine type hardener Dicyandiamide	827-43-0 461-58-5 Total	1 0 100.00	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this doc iy, is not below the threshold of regulatory concern for any re- olding compounds used by Microchip meet the UL94 V0 flam	mply with EU Directive 2002/95/ a internal design controls, supposed in the substance is NOT an inte- ument, there is no credible rea- regulatory scheme world-wide. nmability standard for plastics. plastics/	q Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database	nd, to the best centration of the	rective) and wi of Microchip T e chemical sul st report at	echnology ostance, if	156.56	Amine type hardener Dicyandiamide Total (mg)	827-43-0 461-58-5 Total	1 0 100.00 % of Total Weight	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this doc iy, is not below the threshold of regulatory concern for any rolding compounds used by Microchip meet the UL94 V0 flam tp://ul.com/global/eng/pages/offerings/industries/chemicals/ne protective "tubes" in which the specific product is shippe	an internal design controls, supportion in the manner of t	g Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database or ide (PVC) plastic. "Window envelopes" used to notes restricted by RoHS in Microchip Technology as of the date listed in this form. Microchip Technology as of the date listed in this form. Microchip Technology on may not have been provided by subcontract a ge weight of anticipated significant toxic metals	and, to the best centration of the st to obtain a te hold the packing y Incorporated's inclogy Incorporovided by raw issemblers and	of Microchip T e chemical sul st report at ng slip on the o s semiconduct rated cannot g material sup raw material sup	echnology stance, if outer box or devices juarantee the liers.	156.56	Amine type hardener Dicyandiamide Total (mg)	827-43-0 461-58-5 Total Chip (Die)	1 0 100.00 % of Total Weight	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this docty, is not below the threshold of regulatory concern for any rolding compounds used by Microchip meet the UL94 V0 flam tp://ul.com/global/eng/pages/offerings/industries/chemicals/, he protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic. Intercochip Technology Incorporated believes the information in their original packing materials is true and correct to the be sympleteness and accuracy of data in this form because it has upplier information is often protected from disclosure as tracformation is provided only as estimates of the average weight.	an internal design controls, supportion in the substance is NOT an internal design controls, supportion in the substance is NOT an internation in the substance is no credible rearegulatory scheme world-wide. In the substance is not a substance in the substance is not in the substance in the substance in the substance in the substance is not interest in the substance in the subs	g Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database or ide (PVC) plastic. "Window envelopes" used to choose restricted by RoHS in Microchip Technolog as of the date listed in this form. Microchip Technolog as of the date listed in this form. Microchip Technolog no may not have been provided by subcontract a ge weight of anticipated significant toxic metals ices (silicon IC) in the finished parts.	nd, to the best centration of the sto obtain a technology incorporated's included by raw issemblers and components. T	of Microchip T e chemical sul st report at ng slip on the c s semiconduct rated cannot g material supp raw material s hese estimates	echnology ostance, if outer box or devices uarantee the liers. suppliers. s do not		Amine type hardener Dicyandiamide Total (mg) Doped Silicon	827-43-0 461-58-5 Total Chip (Die) 7440-21-3	1 0 100.00 % of Total Weight 100	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this doc ity, is not below the threshold of regulatory concern for any polding compounds used by Microchip meet the UL94 V0 flam tp://ul.com/global/eng/pages/offerings/industries/chemicals/ ne protective "tubes" in which the specific product is shippe dd certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in their original packing materials is true and correct to the be empleteness and accuracy of data in this form because it has upplier information is often protected from disclosure as tract formation is provided only as estimates of the average weigh clude trace levels of dopants, metals, and non-metal material icrochip Technology Incorporated does not provide any warn arranties provided by Microchip Technology Incorporated and arranties provided by Microchip Technology Incorporated arranties provided by Microchip Technology Incorporated arranties provided by Microchip Technology Incorporated arranties provided by Microchip Technology Incorporated	an internal design controls, supportion in the animal design controls, supportion in the substance is NOT an internal design controls, supportion in the substance is no credible rearegulatory scheme world-wide. In this form concerning substances of its knowledge and belief, is been compiled based on the substance of the substan	g Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database or	and, to the best centration of the sto obtain a technology incorporated innology incorporated by raw issemblers and components. The according to the store of sale. These and direct or indirect or in	of Microchip T e chemical sul st report at ng slip on the of s semiconduct rated cannot g material supp raw material s hese estimates lusive, limited tre provided in ct, consequen	echnology ostance, if outer box or devices uarantee the liers. uppliers. s do not product Microchip's tial or		Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total	827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond	1 0 100.00 % of Total Weight 100 100.00 % of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this doc iy, is not below the threshold of regulatory concern for any ro olding compounds used by Microchip meet the UL94 V0 flam tp://ul.com/global/eng/pages/offerings/industries/chemicals/, the protective "tubes" in which the specific product is shippe and certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in their original packing materials is true and correct to the be ompleteness and accuracy of data in this form because it has upplier information is often protected from disclosure as trac- formation is provided only as estimates of the average weigh clude trace levels of dopants, metals, and non-metal material icrochip Technology Incorporated does not provide any warrarranties provided by Microchip Technology Incorporated ar iotations, sales order acknowledgement, and invoices. icrochip disclaims any duty to notify users of updates or cha herwise, suffered by users or third parties as a result of the herwise, suffered by users or third parties as a result of the	an internal design controls, supportion in the animal design controls, supportion in the substance is NOT an internal design controls, supportion in the substance is no credible rearegulatory scheme world-wide. In this form concerning substances of its knowledge and belief, is been compiled based on the substance of the substan	g Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database or	and, to the best centration of the sto obtain a technology incorporated innology incorporated by raw issemblers and components. The according to the store of sale. These and direct or indirect or in	of Microchip T e chemical sul st report at ng slip on the of s semiconduct rated cannot g material supp raw material s hese estimates lusive, limited tre provided in ct, consequen	echnology ostance, if outer box or devices uarantee the liers. uppliers. s do not product Microchip's tial or		Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total	827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1 0 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the cher corporated's knowledge and belief as of the date of this doc iy, is not below the threshold of regulatory concern for any ro- biding compounds used by Microchip meet the UL94 V0 flam tp://ul.com/global/eng/pages/offerings/industries/chemicals/, the protective "tubes" in which the specific product is shipped id certain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in their original packing materials is true and correct to the be impleteness and accuracy of data in this form because it has implier information is often protected from disclosure as trac- formation is provided only as estimates of the average weigh clude trace levels of dopants, metals, and non-metal material crochip Technology Incorporated does not provide any warrarranties provided by Microchip Technology Incorporated are increased in the control of the crochip Technology Incorporated does not provide any warrarranties provided any discrochip Technology Incorporated are increased as the control of the crochip disclaims any duty to notify users of updates or cha- herwise, suffered by users or third parties as a result of the herwise, suffered by users or third parties as a result of the	an internal design controls, supportion in the animal design controls, supportion in the substance is NOT an internal design controls, supportion in the substance is no credible rearegulatory scheme world-wide. In this form concerning substances of its knowledge and belief, is been compiled based on the substance of the substan	g Total Mass TEC (RoHS Directive), EU Directive 2011/65/EU (RoHS Directive), and /or analytical test data. Intional ingredient in the semiconductor device a son to believe that the unavoidable impurity con You can access the UL iQTM family of database or	and, to the best centration of the sto obtain a technology incorporated innology incorporated by raw issemblers and components. The according to the store of sale. These and direct or indirect or in	of Microchip T e chemical sul st report at ng slip on the of s semiconduct rated cannot g material supp raw material s hese estimates lusive, limited tre provided in ct, consequen	echnology ostance, if outer box or devices uarantee the liers. uppliers. s do not product Microchip's tial or	4.18	Amine type hardener Dicyandiamide Total (mg) Doped Silicon (mg) Total Doped Gold	827-43-0 461-58-5 Total Chip (Die) 7440-21-3 Total Wire Bond Plating on external leads (pins) - Matte Tin	1 0 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

SP 28 SPDIP 11:00 AM : 8/29/2013

Basic Substance CAS Number Sub-Component Weight mg/gart ppm 518.59 (mg) Total Modic Compound Sub-Component No. 1886 (1987-6-8-0) Modic Compound 4.57 (1987-7-4-8-87) Modic Com	JEDEC 97 Product Marking and/or Pkg. Labeling e3		nogeneous Materials: e.g. pc boards, displa	•		•	nation Base A oper Alloy (Cu		PLCC (L4)	⊋: L 28 (Lead) P	MICROCHIP Semiconductor Device Type:
Epox Resin (No Browness)	ht 71.63	% ot Total Weight	Mold Compound	(mg) Total	818.39	nnm	mg/part		"Contained In"		
Equation (Seal Photocomes No distribution (1996) and the seal of t	1	85.00	60676-86-0	Silica vitreous				60.886	Mold Compound	60676-86-0	Silica vitreous
Pherenic Resen (No Br CL SEO)3. To distiminary trousles) Trade Secret Model Compound 1.755 200.51 17.69 Characteristics (Proposition 1.755 200.51 17.69 Characteristics (Propo	1										
Epocy, Cereal Novolace 26600-522 Moid Compound 1.755 2.055 1.77-49 Carbon Black 1333-894 Moid Compound 2.755 2.455 2.145 Copper 7440-51-8 Lead Frame 25.115 286-845 25.148 Zirrorium 7440-51-7 Lead Frame 2.5115 286-845 25.148 Zirrorium 7440-51-7 Lead Frame 0.051 0.278 22.23 Manganese 7.459-89-5 Lead Frame 0.051 0.278 25.24 Silver 7440-24 De Attach 0.051 0.578 506 Gamma-bulyrolactione 19-48-0 De Attach 0.051 0.578 506 Gamma-bulyrolactione 19-48-0 De Attach 0.051 0.578 506 Gamma-bulyrolactione 19-48-0 De Attach 0.051 0.077 0.800 770 Trin 7440-51-5 Para o steroid selection 0.077 0.800 770 0.800 770 Trin 7440-51-5 Para o steroid selection 0.077 0.800 770 0.800 770 0.800 770 0.800 0.701 0.701 0.7	1										
Copper 7440-92-8 Lead Frame 25.115 28.945 251,146 4,883 292.3 (mg) Total Lead Frame 5,048 6,578 4,	1										
Silver 7440-22-4 Lead Frame 0,488 5.578 4.883 292.83 (mg) Total Lead Frame 9,026 0,233 256 250 250 250 250 250 250 250 250 250 250	1										
Zirconium 7440-677 Lead Frame 0.026 0.293 256 Managese 7430-96-5 Lead Frame 0.001 0.015 13 2 Silver 7440-02-4 Die Attach 0.163 1.860 1.628 Zirconium 7440-02-7 0.10 Managese 7430-96-5 1.00 Managese 7	<u></u>	100.00	Total			251,148	286,945	25.115	Lead Frame	7440-50-8	Copper
Zirconium 7440-977 Lea6 Frame 0.028 0.283 256 Manages (1439-96-5 Lead Frame 0.001 0.015 13 3 Series (1440-97-7 0.10 Series (1400-97-7 0.1				(mg) Total	292.83						
Mangainese 7439-96-5 Lead Frame 0.001 0.015 13 13 Silver 7440-22-4 Die Attach 0.163 1.890 1,528 Epoxy resin Trade Secret Die Attach 0.007 0.075 68 Gamma-buyrolactone 96-48-0 Die Attach 0.007 0.075 68 Gamma-buyrolactone 96-48-0 Die Attach 0.007 0.075 68 Gamma-buyrolactone 96-48-0 Die Attach 0.007 0.075 0.000 700 Gold 7440-57-3 Chip (Die) 1.210 13.825 12,100 For the Part of	1 20.00				202.00	,					
Silver 7440-22-4 Die Attach Die Atta	1										
Epoxy resin Trade Secret Die Attach 0.051 0.578 508 Menganese 7439-96-5 0.01 0.007 0.075 68 Total 100.00 1.007 0.075 0.007 0	1										
Gamma-butyrolactone 96-8-0 Die Attach 0.007 0.075 66 Sillocon 7440-213 Chip (Die) 1.210 1.3825 12,100 2.51 (mg) Total 3.825 12,100 2.51 (mg) Total 4.167 12,100	1										
Silicon 7440-21-3 Chip (Die) 1,210 1,3825 12,100 2,51 (mg) Total Die Attach 74 (140-21-3) (Mire Bond 7440-57-5) (Wire Bond 7440-57-5) (Wire Bond 1,442-53 (Mire Bond 1	= 0				l l						1 7 7
Gold 7440-57-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 7440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.50 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting on elemental leading pires) - Market Thr / arrenased at 1597°C for 1 tow 1 1,24.00 Total Weight Tin 9440-31-5 Putting Tin 9440-31-5 P				(mg) Total	2 51						
Tin 7440-31-5 Page on external leads (para) - Matter Tin / anneabled at 1970 for 1 hour 1.240 14.167 12.400 1.000,000 1.42.50 1.000,000	<u> </u>				2.01			0.070			
1.1425 g Total Mass Total Semiconductor device and its homogenous materials comply with EU Directive 2002/59/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 13.82 Total (mg) Chip (Die) % of Total Weight Compliance with the above EU Directives and its homogenous materials comply with EU Directive 2002/59/EC (RoHS Directive). If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Modeling compounds used by Microchip meet the UL94 V9 flammability standard for plastics. You can access the UL IQTM family of databases to obtain a test report at hittp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form because it has been compiled based on the ranges provided in Microchip Technology incorporated dates in this form disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosure as trade secrets and some information in soften protected from disclosures as trade secrets and some information in softe	1										
1.1425 g Total Mass Total (mg) T	1									7 1 10 0 1 0	1111
This semiconductor device and its homogenous materials comply with EU Directive 2002/39/EC (RoHS Directive). EU Directive 2002/39/EC (RoHS Directive). 13.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 13.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 13.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 13.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 13.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 15.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 15.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 15.82 Total (mg) Chip (Die) % of Total Weight Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 16.80 (mg) Total (<u> </u>	100 00		Carrina Datyrolaciono	l l	.,,	.,			1 1/25	
if a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Suppliers information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Suppliers of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information in Material Content	ht 1.21			(3/	13.82	EU	ctive) and with	S Recast Direc	, , , , , , , , , , , , , , , , , , ,		Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).
Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's quotations, sales order acknowledgement, and invoices. 14.17 (mg) Total Weight (mg) Total (100	7440-21-3	Doped Silicon					s, supplier declarations, and /or analytical test data.	ernal design controls	Compliance with the above EU Directives has been verified via inter
http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Suppliers of oppants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or	0	100.00	Total			٠,	chemical subs	ntration of the	ble reason to believe that the unavoidable impurity concerl-wide.	ent, there is no credit latory scheme world	Incorporated's knowledge and belief as of the date of this document any, is not below the threshold of regulatory concern for any regula
certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided by subcontract assemblers and raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's anticipated significant toxic metals components. The exclusive, limited product warranties provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and incorporated and its subsidiaries are contained in Microc	ht 0.07	% of Total Weight	Wire Bond	(mg) Total	0.80		report at	o obtain a test	astics. You can access the UL IQTM family of databases t		
Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and the subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and the subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and the subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and the subsidiaries are contained in Microchip's and the subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and the subsidiaries are contained in Microchip's and the subsidiaries are contained in Microchip's and the subsidiaries are		100	7440-57-5	Doped Gold		ter box and	slip on the ou	ld the packing	nyl chloride (PVC) plastic. "Window envelopes" used to he	e made from polyvin	
warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 14.17 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for dannealed at 150°C for one of the material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or	<u></u>	100.00	Total			ntee the rs. Supplier formation	d cannot guara aterial supplie al suppliers. In	y Incorporated vided by raw m and raw materi	lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers : light of anticipated significant toxic metals components. T	s knowledge and bel en compiled based of d some information and the average we	their original packing materials is true and correct to the best of its completeness and accuracy of data in this form because it has beer information is often protected from disclosure as trade secrets and is provided only as estimates of the average weight of these parts a
otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or Tin 7440-31-5 100.00	ht 1.24	% of Total Weight	leads (pins) - Matte Tin	(mg) Total	14.17	icrochip's	provided in M	sale. These are	ntained in Microchip's standard terms and conditions of	s subsidiaries are co	warranties provided by Microchip Technology Incorporated and its squotations, sales order acknowledgement, and invoices.
of this Certificate of Compilative for Semiconductor products.		100.00	7440-31-5	Tin							
Total 100.00	ō	100.00	Total								

L 28 PLCC 11:00 AM : 8/29/2013

Halogen-Free

Semiconductor Device Typ	e. NHE 32 // 02	a) PLCC (P3)		nation Base A pper Alloy (C	. ,			geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
ocimoonaacion bevice typ	C. ITTL 32 (Lear	"Contained In"	% Total	1				1	1	
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	677.40	(mg) Total	Mold Compound	% ot Total Weight	60
Silica, vitreous	60676-86-0	Mold Compound	51.000	575.790	510,000		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.675	41.491	36,750		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.675	41.491	36,750		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.470	16.596	14,700		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.180	2.032	1,800		Carbon Black	1333-86-4	0.30	
Copper (Cu)	7440-50-8	Lead Frame	29.760	335.990	297,600			Total		
Nickle (Ni)	7440-02-0	Lead Frame	1.280	14.451	12,800	361.28	(mg) Total	Lead Frame	% of Total Weight	32
Silicon (Si)	7440-21-3	Lead Frame	0.320	3.613	3,200		Copper (Cu)	7440-50-8	93.00	
Magnesium (Mg)	7439-95-4	Lead Frame	0.064	0.723	640		Nickle (Ni)	7440-02-0	4.00	
Silver (Ag) Silver (Ag)	7440-22-4 7440-22-4	Lead Frame Die Attach	0.576 0.064	6.503 0.723	5,760 640		Silicon (Si) Magnesium (Mg)	7440-21-3 7439-95-4	1.00 0.20	
Epoxy Resin	Trade Secret	Die Attach	0.064	0.723	136		Silver (Ag)	7439-95-4 7440-22-4	1.80	
Copper (Cu)	7440-50-8	Die Attach	0.002	0.027	24		Sliver (Ag)	Total		
Silicon	7440-50-8	Chip (Die)	4.820	54.418	48,200	0.90	(max) Tatal		% of Total Weight	0.08
Gold	7440-21-3	Wire Bond	0.100	1.129	1.000	0.90	(mg) Total Silver (Ag)	Die Attach 7440-22-4	80	0.08
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.000	33.870	30,000		Epoxy Resin	Trade Secret	17	
IIII	7440-31-3	TOTALS:	100.000	1.129.000	1.000.000		Copper (Cu)	7440-50-8	3	
	4 4200		100.000	1,123.000	1,000,000		Copper (Cu)	Total	-	
		g Total Mass						iotai	100.00	
	with EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65	5/EU (RoHS Re	ecast Directive) and with	54.42	Total (mg)	Chip (Die)	% of Total Weight	4.82
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		, ,	•	ecast Directive) and with	54.42	Total (mg) Doped Silicon	7440-21-3	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). apliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical anology Incorporated's knowledge and belief as of the date of	ernal design control al substance is NOT a this document, ther	s, supplier declarations, and /or analytical test de an intentional ingredient in the semiconductor de e is no credible reason to believe that the unavo	ata. evice and, to t	he best of Mic	rochip	54.42	· · · · ·		100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via inthemical substance is absent from the list above, the chemical substance is knowledge and belief as of the date of nical substance, if any, is not below the threshold of regulatoring compounds used by Microchip meet the UL94 V0 flamma	ernal design control al substance is NOT a this document, ther ry concern for any re bility standard for pla	s, supplier declarations, and /or analytical test dans intentional ingredient in the semiconductor due is no credible reason to believe that the unavougulatory scheme world-wide.	ata. evice and, to t idable impurit	he best of Mic y concentratio	rochip n of the	1.13	· · · · ·	7440-21-3	100	
semiconductor device and its homogenous materials comply Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). apliance with the above EU Directives has been verified via interpretation of the properties of the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance, if any, is not below the threshold of regulator thing compounds used by Microchip meet the UL94 VO flamma://ul.com/global/eng/pages/offerings/industries/chemicals/plast/protective "tubes" in which the specific product is shipped as the protective "tubes" in which the specific product is shipped as the protective "tubes" may be made from PVC plastic.	ernal design control al substance is NOT a i this document, ther ry concern for any re bility standard for platics/	s, supplier declarations, and /or analytical test dans intentional ingredient in the semiconductor dans in credible reason to believe that the unavougulatory scheme world-wide. astics. You can access the UL iQTM family of dans	ata. evice and, to t idable impurit tabases to ob	he best of Mici y concentratio tain a test repo	rochip n of the ort at		Doped Silicon	7440-21-3 Total	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In pliance with the above EU Directives has been verified via into themical substance is absent from the list above, the chemical nology Incorporated's knowledge and belief as of the date of mical substance, if any, is not below the threshold of regulated ting compounds used by Microchip meet the UL94 V0 flamma://ul.com/global/eng/pages/offerings/industries/chemicals/plaiprotective "tubes" in which the specific product is shipped a	ernal design controls al substance is NOT a this document, ther ry concern for any re bility standard for platics/ re made from polyvin is form concerning s ale best of its knowled form because it has I m disclosure as trad attes of the average w	s, supplier declarations, and /or analytical test dean intentional ingredient in the semiconductor dean intentional ingredient in the semiconductor dean is no credible reason to believe that the unavougulatory scheme world-wide. astics. You can access the UL iQTM family of day of the control of the contr	ata. evice and, to t idable impurit tabases to ob used to hold th nnology Incor Microchip Tec Material Safet en provided i nticipated sig	he best of Microscopic y concentration a test reported by the packing slip porated's semi hnology Incorpy Data Sheets by subcontract inificant toxic n	or the on the conductor porated provided by a sasemblers netals		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In pliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical nology Incorporated's knowledge and belief as of the date of mical substance, if any, is not below the threshold of regulated ting compounds used by Microchip meet the UL94 V0 flamma://ul.com/global/eng/pages/offerings/industries/chemicals/plat/protective "tubes" in which the specific product is shipped as or box and certain "reels" may be made from PVC plastic. Toochip Technology Incorporated believes the information in the ces in their original packing materials is true and correct to the tot guarantee the completeness and accuracy of data in this material suppliers. Information is provided only as estimal material suppliers. Information is provided only as estimal.	ernal design control al substance is NOT a this document, ther ry concern for any re bility standard for platics/ re made from polyvin is form concerning s he best of its knowled form because it has i m disclosure as trad attes of the average w hts, metals, and non- ty, express or implied ed and its subsidiarie	s, supplier declarations, and /or analytical test dean intentional ingredient in the semiconductor dean intentional ingredient in the semiconductor dean is no credible reason to believe that the unavougulatory scheme world-wide. astics. You can access the UL iQTM family of day of the control of the contr	ata. evice and, to t idable impurit tabases to ob used to hold th anology Incorp Microchip Tec Material Safet een provided I nticipated sig is (silicon IC) in s declaration.	he best of Micry concentration tain a test reported by the packing slip porated's semi hnology incorpy Data Sheets by subcontract inificant toxic in the finished p	or the on the conductor porated provided by a tassemblers netals arts.		Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.1
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Appliance with the above EU Directives has been verified via introchemical substance is absent from the list above, the chemical nology Incorporated's knowledge and belief as of the date of mical substance, if any, is not below the threshold of regulator sing compounds used by Microchip meet the UL94 V0 flamma //ul.com/global/eng/pages/offerings/industries/chemicals/platrochemicals/	ernal design control al substance is NOT a i this document, ther ry concern for any re bility standard for platics/ re made from polyvin is form concerning s is best of its knowler form because it has I m disclosure as trad ites of the average w ints, metals, and non- ity, express or implier ed and its subsidiarie t, and invoices. es to Material Conten issers' reliance on the	s, supplier declarations, and /or analytical test dan intentional ingredient in the semiconductor de is no credible reason to believe that the unavoigulatory scheme world-wide. astics. You can access the UL iQTM family of day of the control of t	ata. evice and, to to tidable impurite tabases to observed to hold the tabases to record to the tabases to observed to hold the tabases to observed the tabases to observed the tabases to observe tabases to observe tabases to observe tabases to observe tabases tabases to observe tabases tabase	he best of Micc y concentration tain a test reponse packing slip porated's seminology Incorp y Data Sheets by subcontract intermediate to the finished portion that is the finished portion to the finished portion to sale. These or indirect, coincident contracts	rochip n of the on the conductor poorated provided by assemblers netals arts. limited e are	1.13	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.1

NHE 32 PLCC 11:00 AM : 8/29/2013

MICROCHIP Semiconductor Device Type	2· I & N.IF 44 ((a	ead) PLCC (T2/TC)		nation Base A				nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Connectination Devices Type	1	"Contained In"	% Total		l					
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	1807.79	(mg) Total	Mold Compound	% ot Total Weight	76.1
Silica, vitreous	60676-86-0	Mold Compound	64.685	1536.618	646,850		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.661	110.727	46,611		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.661	110.727	46,611		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.864	44.291	18,645		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.228	5.423	2,283		Carbon Black	1333-86-4	0.30	
Copper Silver	7440-50-8 7440-22-4	Lead Frame	21.460 0.417	509.786 9.911	214,598			Total	100.00	
		Lead Frame			4,172	520.24	(mg) Total	Lead Frame	% of Total Weight	21.9
Zirconium Manganese	7440-67-7 7439-96-5	Lead Frame Lead Frame	0.022 0.001	0.520 0.026	219 11		Copper Silver	7440-50-8 7440-22-4	97.99 1.91	
Silver	7440-22-4	Die Attach	0.001	2.461	1.036		Zirconium	7440-22-4	0.10	
Epoxy resin	Trade Secret	Die Attach	0.032	0.765	322		Manganese	7439-96-5	0.10	
Gamma-butyrolactone	96-48-0	Die Attach	0.002	0.100	42		Manganese	Total	100.00	
Silicon	7440-21-3	Chip (Die)	0.870	20.667	8.700	3.33	(mg) Total	Die Attach	% of Total Weight	0.14
Gold	7440-57-5	Wire Bond	0.050	1.188	500	0.00	Silver	7440-22-4	74	•
Tin		ting on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.940	22.330	9,400		Epoxy resin	Trade Secret	23	
		TOTALS:	100.000	2,375.540	1,000,000		Gamma-butyrolactone	96-48-0	3	
	2.3755 g	Total Mass					•	Total	100.00	
nis semiconductor device and its homogenous materials compl	y with EU Directive 2002	2/95/EC (RoHS Directive), EU Directive 2011/65	JEU (RoHS Rec	ast Directive)	and with EU	20.67	Total (mg)	Chip (Die)	% of Total Weight	0.87
ais semiconductor device and its homogenous materials compl rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via in the achemical substance is absent from the list above, the chemical Incorporated's knowledge and belief as of the date of the incorporated is any, is not below the threshold of regulators.	ernal design controls, s al substance is NOT an f this document, there is	supplier declarations, and /or analytical test de intentional ingredient in the semiconductor de s no credible reason to believe that the unavo	ata. evice and, to th	e best of Micr	ochip	20.67	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight	0.87
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic chnology Incorporated's knowledge and belief as of the date o	ernal design controls, s al substance is NOT an f this document, there is ry concern for any regu ability standard for plasi	supplier declarations, and /or analytical test di intentional ingredient in the semiconductor di son credible reason to believe that the unavoulatory scheme world-wide.	ata. evice and, to th idable impurity	e best of Micr concentration	ochip n of the	1.19		7440-21-3	100	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In propose with the above EU Directives has been verified via interpretable a chemical substance is absent from the list above, the chemical substance is knowledge and belief as of the date of the date of the chemical substance, if any, is not below the threshold of regulator olding compounds used by Microchip meet the UL94 V0 flammar	ernal design controls, s al substance is NOT an f this document, there is ry concern for any regu ability standard for plast stics/	supplier declarations, and /or analytical test di intentional ingredient in the semiconductor di s no credible reason to believe that the unavoulatory scheme world-wide. tics. You can access the UL iQTM family of da	ata. evice and, to th idable impurity atabases to obta	e best of Micr concentration ain a test repo	ochip n of the rt at		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.05
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical chohology Incorporated's knowledge and belief as of the date o nemical substance, if any, is not below the threshold of regulated colding compounds used by Microchip meet the UL94 V0 flammatp://ul.com/global/eng/pages/offerings/industries/chemicals/pla	ernal design controls, sal substance is NOT and this document, there is ry concern for any regulability standard for plast stics/ re made from polyvinyl sis form concerning subsections to fits knowledge form because it has been midisclosure as trade sates of the average weigt.	supplier declarations, and /or analytical test dintentional ingredient in the semiconductor distriction of the control of the	ata. evice and, to the idable impurity atabases to obtain the idabases to obtain the idabases to hold the idabase	e best of Micr concentration ain a test repo e packing slip orated's semi inology Incorp Data Sheets p y subcontract ificant toxic n	ochip n of the rt at on the conductor orated rovided by assemblers letals		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.05
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In publiance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance, if any, is not below the threshold of regulated belief as of the date of	ernal design controls, sal substance is NOT an fithis document, there is ry concern for any regulability standard for plast stics/ re made from polyvinyl his form concerning subtle best of its knowledge form because it has bee mid disclosure as trade sates of the average weights, metals, and non-mety, express or implied, wed and its subsidiaries	supplier declarations, and /or analytical test dintentional ingredient in the semiconductor districts to credible reason to believe that the unavoulatory scheme world-wide. tics. You can access the UL iQTM family of datchloride (PVC) plastic. "Window envelopes" to chloride (PVC) plastic. "Window envelopes" to each belief, as of the date listed in this form. In compiled based on the ranges provided in listered in the source sand some information may not have begit of these parts and the average weight of a etal materials contained within silicon devices with respect to the information provided in this	ata. evice and, to the idable impurity atabases to obtain the impurity atabases to obtain the idabases to hold the impurity incorp. Microchip Tech Material Safety en provided by inticipated sign is (silicon IC) in its declaration. T	e best of Micr concentration ain a test report e packing slip orated's semi nology Incorp Data Sheets p y subcontract ificant toxic nother finished p	ochip n of the rt at on the conductor orated rovided by assemblers netals arts.		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.05
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical ichnology Incorporated's knowledge and belief as of the date of the	ternal design controls, sal substance is NOT an fithis document, there is ry concern for any regulability standard for plast stics/ re made from polyvinyl his form concerning subse best of its knowledge form because it has been disclosure as trade sates of the average weignts, metals, and innomity, express, and innoled, ty, and invoices. es to Material Content I users' reliance on the in users' reliance on the in	supplier declarations, and /or analytical test dintentional ingredient in the semiconductor dis no credible reason to believe that the unavoulatory scheme world-wide. tics. You can access the UL iQTM family of datchloride (PVC) plastic. "Window envelopes" to chloride (PVC) plastic. "Window envelopes" to chloride (PVC) plastic. "Window envelopes" to compile display the form. In compiled based on the ranges provided in list of these parts and the average weight of a etal materials contained within silicon devices with respect to the information provided in this are contained in Microchip's standard terms are contained in Microchip's standard terms are collected.	ata. evice and, to the idable impurity atabases to obtain the idabases to obtain the idabase idab	e best of Micr concentration ain a test report e packing slip orated's semi- nology Incorp Data Sheets p y subcontract ificant toxic in the finished p "he exclusive, of sale. These	ochip n of the rt at on the conductor orated rovided by assemblers tetals arts. limited are asequential	1.19	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.05

L NJE 44 PLCC 11:01 AM : 8/29/2013

Halogen-Free

MICROCHIP Semiconductor Device Type	. 1 69 (1)	21 CC and the		nation Base A pper Alloy (C				ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Connectination Device Type	. L OO (Leau) I	"Contained In"	% Total	1						
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	1380.06	(mg) Total	Mold Compound	% ot Total Weight	28.28
Silica, vitreous	60676-86-0	Mold Compound	24.038	1173.054	240,380		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	1.732	84.529	17,322		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	1.732	84.529	17,322		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	0.693	33.812	6,929		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.085	4.140	848		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	22.087	1077.843	220,869			Total	100.00	
Silver	7440-22-4	Lead Frame	0.429	20.954	4,294	1099.95	(mg) Total	Lead Frame	% of Total Weight	22.54
Zirconium	7440-67-7	Lead Frame	0.023	1.100	225		Copper	7440-50-8	97.99	
Manganese	7439-96-5	Lead Frame	0.001	0.055	11		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	9.983	487.146	99,825		Zirconium	7440-67-7	0.10	
Diester Resin	94-80-4	Die Attach	1.997	97.429	19,965		Manganese	7439-96-5	0.01	
Functionalized Urethane Resin	72869-86-4	Die Attach	0.666	32.476	6,655			Total	100.00	<u>-</u>
Epoxy Resin	9003-36-5	Die Attach	0.333	16.238	3,328	649.53	(mg) Total	Die Attach	% of Total Weight	13.31
Epoxy Resin	13561-08-5	Die Attach	0.333	16.238	3,328		Silver	7440-22-4	75	
Silicon	7440-21-3	Chip (Die)	12.310	600.728	123,100		Diester Resin	94-80-4	15	
Gold	7440-57-5	Wire Bond	5.120	249.856	51,200	Fun	ctionalized Urethane Resin	72869-86-4	5	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	18.440	899.872	184,400		Epoxy Resin	9003-36-5	3	
	•	TOTALS:	100.000	4,880.000	1,000,000		Epoxy Resin	13561-08-5	3	
	4 8800	g Total Mass						Total	100.00	<u>.</u>
Compliance with the above EU Directives has been verified via inte If a chemical substance is absent from the list above, the chemical Technology Incorporated's knowledge and belief as of the date of the chemical substance, if any, is not below the threshold of regulatory	substance is NOT	an intentional ingredient in the semiconductor de- re is no credible reason to believe that the unavoid	vice and, to the				Doped Silicon	7440-21-3 Total	100	
Molding compounds used by Microchip meet the UL94 V0 flammab http://ul.com/global/eng/pages/offerings/industries/chemicals/plast		lastics. You can access the UL iQTM family of data	abases to obta	in a test report	at	249.86	(mg) Total	Wire Bond	% of Total Weight	5.12
The protective "tubes" in which the specific product is shipped are box and certain "reels" may be made from PVC plastic.	made from polyvi	nyl chloride (PVC) plastic. "Window envelopes" us	sed to hold the	packing slip o	n the outer		Doped Gold	7440-57-5	100	
Microchip Technology Incorporated believes the information in this devices in their original packing materials is true and correct to the cannot guarantee the completeness and accuracy of data in this fr aw material suppliers. Supplier information is often protected fron and raw material suppliers. Information is provided only as estimat components. These estimates do not include trace levels of dopan	best of its knowle frm because it has disclosure as traces es of the average of	edge and belief, as of the date listed in this form. M been compiled based on the ranges provided in N de secrets and some information may not have bee weight of these parts and the average weight of an	icrochip Tech laterial Safety en provided by ticipated signi	nology Incorpo Data Sheets pr subcontract a ficant toxic me	rated rovided by issemblers itals			Total	100.00	•
Microchip Technology Incorporated does not provide any warranty product warranties provided by Microchip Technology Incorporate in Microchip's quotations, sales order acknowledgement, and invo	d and its subsidiar					899.87	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	18.44
Microchip disclaims any duty to notify users of updates or changes otherwise, suffered by users or third parties as a result of the user (SGS) or of this Certificate of Compliance for semiconductor productor.	s' reliance on the i						Tin	7440-31-5	100.00	
						4,880.000)	Total	100.00	100.00

L 68 PLCC 11:01 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: MG 16(Lead) QFN 3	3x3x0.9mm (P9)		nation Base A pper Alloy (C	•		•	ogeneous Materials: .g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			13.79	(mg) Total	Mold Compound	% ot Total Weight	63.82
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm			•		1
Silica, fused	60676-86-0	Mold Compound	57.438	12.407	574,380	_	Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5) Phenolic Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	3.095 3.095	0.669 0.669	30,953 30,953	Epoxy	/ Resin (NLP # 500-033-5) Phenolic Resin	Trade Secret Trade Secret	4.85 4.85	
Carbon Black	1333-86-4	Mold Compound	0.191	0.669	1,915		Carbon Black	1333-86-4	4.85 0.30	
Carbon Black	7440-50-8	Lead Frame	22,289	4.814	222.889	l l	Calbull black	1333-00-4 Total	100.00	<u>J</u>
Iron	7439-89-6	Lead Frame	0.548	0.118	5,483	5.04	(mg) Total	Lead Frame	% of Total Weight	
Silver	7440-22-4	Lead Frame	0.348	0.096	4,444	5.04	Copper	7440-50-8	95.54	23.33
Zinc	7440-66-6	Lead Frame	0.029	0.096	292		Iron	7440-50-8	2.35	
Phosphorous	7723-14-0	Lead Frame	0.029	0.004	192		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.273	0.059	2.730		Zinc	7440-66-6	0.13	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.063	0.014	630		Phosphorous	7723-14-0	0.08	
Treated silica	Trade Secret	Die Attach	0.007	0.002	70			Total	100.00	4
Heterocyclic organic compound	Trade Secret	Die Attach	0.007	0.002	70	0.08	(mg) Total	Die Attach	% of Total Weight	0.35
Silicon	7440-21-3	Chip (Die)	5.350	1.156	53.500		Silver	7440-22-4	78	1
Gold	7440-57-5	Wire Bond	1.840	0.397	18,400		Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5 Plating on	external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	5.310	1.147	53,100		Treated silica	Trade Secret	2	
		TOTALS:	100.000	21.600	1,000,000	Heter	ocyclic organic compound	Trade Secret	2	
	0.0216 g Tota	l Mass						Total	100.00	_
This semiconductor device and its homogenous materials co Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 2002/95/E		IS Recast Direc	ctive) and with	EU	1.16	Total (mg)	Chip (Die)	% of Total Weight	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v If a chemical substance is absent from the list above, the che Incorporated's knowledge and belief as of the date of this do	ia internal design controls, suppli emical substance is NOT an intent cument, there is no credible reasc	C (RoHS Directive), EU Directive 2011/65/EU (RoH er declarations, and /or analytical test data. tional ingredient in the semiconductor device and.	, to the best of	Microchip Tec	hnology	1.16	Total (mg) Doped Silicon	1		5.35
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v If a chemical substance is absent from the list above, the che	ia internal design controls, suppli emical substance is NOT an intent cument, there is no credible reasc regulatory scheme world-wide. mmability standard for plastics. Y	C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. ctional ingredient in the semiconductor device and on to believe that the unavoidable impurity concer	, to the best of ntration of the	Microchip Tec	hnology	0.40	, 5,	Chip (Die) 7440-21-3	% of Total Weight	5.35
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v If a chemical substance is absent from the list above, the che incorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 fla	ia internal design controls, suppli emical substance is NOT an intent cument, there is no credible reasc regulatory scheme world-wide. mmability standard for plastics. Y //plastics/	C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. clional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concertion can access the UL iQTM family of databases to	, to the best of ntration of the o obtain a test	Microchip Teo chemical subs	hnology tance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	5.35
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v If a chemical substance is absent from the list above, the chencorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 fla http://lul.com/global/eng/pages/offerings/industries/chemicals The protective "tubes" in which the specific product is shipp	ia internal design controls, supplication and substance is NOT an intenticument, there is no credible reasor regulatory scheme world-wide. Immability standard for plastics. Yu/plastics/ ed are made from polyvinyl chlorid in this form concerning substanct of its knowledge and belief, as of as been compiled based on the rats and some information may not parts and the average weight of a	C (RoHS Directive), EU Directive 2011/65/EU (RoHor der declarations, and /or analytical test data. Similar disconding the semiconductor device and on to believe that the unavoidable impurity concertou can access the UL iQTM family of databases to ide (PVC) plastic. "Window envelopes" used to be restricted by RoHS in Microchip Technology Infection of the date listed in this form. Microchip Technologinges provided in Material Safety Data Sheets prohave been provided by subcontract assemblers anticipated significant toxic metals components. T	, to the best of ntration of the o obtain a test old the packing accorporated's s gy Incorporate vided by raw m and raw materi	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial supplie	thnology tance, if ter box and devices in ntee the rrs. Supplier formation		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	1.84
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v if a chemical substance is absent from the list above, the chencorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 fla http://ul.com/global/eng/pages/offerings/industries/chemicals The protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the bescompleteness and accuracy of data in this form because it hinformation is often protected from disclosure as trade secre is provided only as estimates of the average weight of these	ia internal design controls, supplication in the comment, there is no credible reasor regulatory scheme world-wide. Immability standard for plastics. Yu/plastics/ ed are made from polyvinyl chlorid in this form concerning substanct of its knowledge and belief, as on as been compiled based on the rats and some information may not parts and the average weight of a within silicon devices (silicon IC) tranty, express or implied, with resumment.	C (RoHS Directive), EU Directive 2011/65/EU (RoHole of declarations, and /or analytical test data. It is a semiconductor device and on to believe that the unavoidable impurity concerviou can access the UL iQTM family of databases to ide (PVC) plastic. "Window envelopes" used to be restricted by RoHS in Microchip Technology Infection of the date listed in this form. Microchip Technologinges provided in Material Safety Data Sheets prohave been provided by subcontract assemblers anticipated significant toxic metals components. To in the finished parts.	, to the best of ntration of the coordinates of the	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial supplie al suppliers. Ir s do not include sive, limited pr	ter box and devices in intee the irs. Supplier iformation e trace oduct		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	1.84
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified v If a chemical substance is absent from the list above, the chencorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 flahttp://ul.com/global/eng/pages/offerings/industries/chemicals. The protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the best completeness and accuracy of data in this form because it hinformation is often protected from disclosure as trade secretic provided only as estimates of the average weight of these levels of dopants, metals, and non-metal materials contained Microchip Technology Incorporated does not provide any was warranties provided by Microchip Technology Incorporated as was marranties and contained the provided by Microchip Technology Incorporated as was marranties provided by Microchip Technology Incorporated as was marranties and contained the provided by Microchip Technology Incorporated as was marranties provided by Microchip Technology Incorporated as was marranties provided by Microchip Technology Incorporated as was marranties as the provided by Microchip Technology Incorporated as was marranties and marranties as a provided by Microchip Technology Incorporated as a provided by Microchip Technology Incorp	ia internal design controls, supplication and the substance is NOT an intenticument, there is no credible reasor regulatory scheme world-wide. Immability standard for plastics. Yulplastics/ ed are made from polyvinyl chlorication in this form concerning substanct of its knowledge and belief, as one is been compiled based on the rate and some information may not parts and the average weight of a within silicon devices (silicon IC) tranty, express or implied, with reind its subsidiaries are contained avanges to Material Content Declarate users' reliance on the informatic	C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. ctional ingredient in the semiconductor device and on to believe that the unavoidable impurity concertou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to he es restricted by RoHS in Microchip Technology In fithe date listed in this form. Microchip Technology In fithe date listed in this form. Microchip Technology In the date listed in Material Safety Data Sheets prohave been provided by subcontract assemblers anticipated significant toxic metals components. To in the finished parts. Espect to the information provided in this declarate in Microchip's standard terms and conditions of stations and shall not be liable for any damages, dia	to the best of ntration of the of the obstain a test old the packing accorporated's say Incorporated yraw mand raw materihese estimates the color. The exclusion. The exclusion are to rindirect or indirect or indirect	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial suppliers. Ir s do not include sive, limited pi p provided in N	ter box and devices in ntee the rs. Supplier formation e trace oduct licrochip's	0.40	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total	% of Total Weight 100 100.00 % of Total Weight 100 100.00	1.84

MG 16L QFN 11:01 AM : 8/29/2013

MICROCHIP Semiconductor Devic	e Tyne: MI 16 (Lood)	OFN (v/mm (DE/DE)		nation Base A pper Alloy (C				nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Jenniconductor Devic	e Type. INL TO (Lead)	"Contained In"	% Total		1			1		
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	19.49	(mg) Total	Mold Compound	% ot Total Weight	t 46.75
Silica, fused	60676-86-0	Mold Compound	42.075	17.545	420,750		Silica, fused	60676-86-0	90.00]
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.267	0.945	22,674		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.267	0.945	22,674		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.140 38.511	0.058	1,403		Carbon Black	1333-86-4	0.30	1
Copper Iron	7440-50-8 7439-89-6	Lead Frame Lead Frame	0.947	16.059 0.395	385,112 9,473	16.81	() T . (.)	Total	100.00 % of Total Weight	
Silver	7440-22-4	Lead Frame	0.947	0.320	7.679	16.81	(mg) Total	Lead Frame 7440-50-8	% of Total Weight 95.54	40.31
Zinc	7440-22-4	Lead Frame	0.768	0.320	504		Copper Iron	7440-50-8	2.35	1
Phosphorous	7723-14-0	Lead Frame	0.033	0.021	333		Silver	7439-69-6	1.91	1
Silver	7440-22-4	Die Attach	1.022	0.426	10.218		Zinc	7440-66-6	0.13	1
Acrylate resins Proprietary	Trade Secret	Die Attach	0.236	0.098	2.358		Phosphorous	7723-14-0	0.08	1
Treated silica	Trade Secret	Die Attach	0.026	0.011	262			Total	100.00	<u>u</u>
Heterocyclic organic compound	Trade Secret	Die Attach	0.026	0.011	262	0.55	(mg) Total	Die Attach	% of Total Weight	
Silicon	7440-21-3	Chip (Die)	7.890	3.290	78.900		Silver	7440-22-4	78	1
Gold	7440-57-5	Wire Bond	0.790	0.329	7.900		Acrylate resins Proprietary	Trade Secret	18	1
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.950	1.230	29,500		Treated silica	Trade Secret	2	1
		TOTALS:	100.000	41.700	1,000,000	Hete	rocyclic organic compound	Trade Secret	2	
	0.0417	g Total Mass						Total	100.00)
	chemical substance is NOT a document, there is no credit	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce					Doped Silicon	7440-21-3 Total	100]
	flammability standard for pla	astics. You can access the UL iQTM family of databases t	to obtain a test	report at		0.33	(mg) Total	Wire Bond	% of Total Weight	t 0.79
e protective "tubes" in which the specific product is shi tain "reels" may be made from PVC plastic.	pped are made from polyvin	nyl chloride (PVC) plastic. "Window envelopes" used to he	old the packing	slip on the ou	iter box and		Doped Gold	7440-57-5	100	
eir original packing materials is true and correct to the b mpleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade sec	est of its knowledge and be has been compiled based of crets and some information se parts and the average we	substances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technolon on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. T licon IC) in the finished parts.	gy Incorporated vided by raw materi	d cannot guara naterial supplici ial suppliers. Ir	antee the ers. Supplier nformation			Total	100.00	9
arranties provided by Microchip Technology Incorporated lotations, sales order acknowledgement, and invoices.	d and its subsidiaries are co	d, with respect to the information provided in this declarat intained in Microchip's standard terms and conditions of	sale. These are	provided in N	licrochip's	1.23	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	2.95
icrochip disclaims any duty to notify users of updates or herwise, suffered by users or third parties as a result of		nt Declarations and shall not be liable for any damages, di					Tin	7440-31-5	100.00	
this Certificate of Compliance for semiconductor produc		normation in material content Declarations (MCD) or inde	pendent tili a p	dity test repo	113 (000) 01				100.00	
		normation in material content declarations (MCD) or inde	pendent tilira p	darry test repor	115 (000) 01			Total	100.00	_

MICROCHIP Semiconductor Device	e Type: ML 20 (Lead) QF	N Avdmm (GA / GM)		ation Base A	•		•	ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
0000	- : ; po: m2 20 (20a) Q1	"Contained In"	% Total	1						1
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	22.31	(mg) Total	Mold Compound	% ot Total Weight	51.79
Silica, fused	60676-86-0	Mold Compound	46.611	20.080	466,110		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.512	1.082	25,118	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	1
Phenolic Resin	Trade Secret	Mold Compound	2.512	1.082	25,118		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.155	0.067	1,554		Carbon Black		0.30	<u>]</u>
Copper	7440-50-8	Lead Frame	36.404	15.683	364,040	_		Total	100.00	
Tin	7440-31-5	Lead Frame	0.093	0.040	934	16.10	(mg) Total	Lead Frame	% of Total Weight	37.37
Silver	7440-22-4	Lead Frame	0.712	0.307	7,119		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.067	0.029	673		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.093	0.040	934		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.053	0.454	10,530		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.243	0.105	2,430		Chromium	7440-47-3	0.25	<u>J</u>
Treated silica	Trade Secret	Die Attach	0.027	0.012	270			Total		
Heterocyclic organic compound	Trade Secret	Die Attach	0.027	0.012	270	0.58	(mg) Total	Die Attach	% of Total Weight	1.35
Silicon	7440-21-3	Chip (Die)	4.410	1.900	44,100		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.640 4.440	0.276	6,400	, ,	Acrylate resins Proprietary	Trade Secret	18	4
Tin	7440-31-5 Platir	ng on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour TOTALS:	4.440 100.000	1.913 43.080	44,400 1.000.000		Treated silica	Trade Secret Trade Secret	2	-
	0.04308 g T		100.000	43.000	1,000,000	Hetero	ocyclic organic compound	Trade Secret		<u>J</u>
This semiconductor device and its homogenous materials Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the c	via internal design controls, su	pplier declarations, and /or analytical test data.		·		1.90	Total (mg) Doped Silicon	7440-21-3	% of Total Weight 100 100.00	
Incorporated's knowledge and belief as of the date of this c any, is not below the threshold of regulatory concern for ar Molding compounds used by Microchip meet the UL94 V0 f http://ul.com/global/eng/pages/offerings/industries/chemica	locument, there is no credible re ny regulatory scheme world-wid lammability standard for plastic	eason to believe that the unavoidable impurity concere.	ntration of the	chemical subs		0.28	(mg) Total	Wire Bond	% of Total Weight	0.64
The protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic.	oped are made from polyvinyl ch	aloride (PVC) plastic. "Window envelopes" used to ho	old the packing	slip on the ou	iter box and		Doped Gold	7440-57-5	100	
Microchip Technology Incorporated believes the informatic their original packing materials is true and correct to the be completeness and accuracy of data in this form because it information is often protected from disclosure as trade sec is provided only as estimates of the average weight of thes levels of dopants, metals, and non-metal materials contains	est of its knowledge and belief, a has been compiled based on the rets and some information may e parts and the average weight ed within silicon devices (silicon	is of the date listed in this form. Microchip Technolog e ranges provided in Material Safety Data Sheets pro not have been provided by subcontract assemblers a of anticipated significant toxic metals components. T IC) in the finished parts.	gy Incorporated vided by raw m and raw materi hese estimates	l cannot guara aterial supplical al suppliers. In do not includ	antee the ers. Supplier nformation de trace			Total	100.00	*
Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or otherwise, suffered by users or third parties as a result of	I and its subsidiaries are contain changes to Material Content Dec	ned in Microchip's standard terms and conditions of scartings and shall not be liable for any damages, di	sale. These are	provided in N , consequenti	flicrochip's al or	1.91	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 7440-31-5	% of Total Weight	4.44
of this Certificate of Compliance for semiconductor produc		and the second s			(000, 01			Total		_
						43.080		Total	100.00	100.000

ML 20 QFN 11:01 AM : 8/29/2013

MICROCHIP	- uo oo	050		nation Base A				ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	e Type: MQ 20 (Lead)	• 1								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	35.52	(mg) Total	Mold Compound	% ot Total Weight	52.91
Silica, fused	60676-86-0	Mold Compound	47.619	31.967	476,190		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.566	1.723	25,661	Epox	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.566	1.723	25,661		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.159	0.107	1,587		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	35.362	23.738	353,616			Total	100.00	
Tin	7440-31-5	Lead Frame	0.091	0.061	908	24.37	(mg) Total	Lead Frame	% of Total Weight	36.3
										777
Silver	7440-22-4	Lead Frame	0.692	0.464	6,915		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.065	0.044	653		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.091	0.061	908		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.412	0.948	14,118		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.326	0.219	3,258		Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.036	0.024	362			Total	100.00	<u>.</u> !
Heterocyclic organic compound	Trade Secret	Die Attach	0.036	0.024	362	1.22	(mg) Total	Die Attach	% of Total Weight	1.81
Silicon	7440-21-3	Chip (Die)	4.160	2.793	41.600		Silver		78	
Gold	7440-57-5	Wire Bond	0.540	0.363	5,400		Acrylate resins Proprietary	Trade Secret	18	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.280	2.873	42.800		Treated silica	Trade Secret	2	
	7440 01 0	TOTALS:	100.000	67.130	1.000.000	Hotor	ocyclic organic compound	Trade Secret	2	
	0.00742	Total Mass	100.000	07.130	1,000,000	пецеі	ocyclic organic compound	Total	100.00	
nis semiconductor device and its homogenous materials	•		IS Pacaet Dire	ctive) and with	FII					
	comply with LO Directive 20	02/33/LG (NOTIO Directive), LO Directive 2011/03/LG (NOT	io necasi bile	cuve, and with		0.70				
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).						2.79	Total (mg)	Chip (Die)	% of Total Weight	4.16
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified	via internal design controls	s, supplier declarations, and /or analytical test data.				2.79	Total (mg) Doped Silicon	7440-21-3	% of Total Weight	4.16
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cl corporated's knowledge and belief as of the date of this d	hemical substance is NOT a locument, there is no credib	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concer				2.79		,		4.16
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cl corporated's knowledge and belief as of the date of this d ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fi	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concer wide.	ntration of the	chemical subs		0.36		7440-21-3	100	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cl corporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fl tp://ul.com/global/eng/pages/offerings/industries/chemicane protective "tubes" in which the specific product is ship	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla lls/plastics/	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concer wide. istics. You can access the UL iQTM family of databases t	ntration of the	chemical subs	stance, if		Doped Silicon	7440-21-3 Total	100	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cl corporated's knowledge and belief as of the date of this d ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fi tp://ul.com/global/eng/pages/offerings/industries/chemica	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla lls/plastics/	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concer wide. istics. You can access the UL iQTM family of databases t	ntration of the	chemical subs	stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ci corporated's knowledge and belief as of the date of this d ny, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 ff tp://ul.com/global/eng/pages/offerings/industries/chemica ne protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic.	hemical substance is NOT a locument, there is no credib ly regulatory scheme world- lammability standard for pla lls/plastics/ oped are made from polyving	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concervide. In intentional ingredient that the unavoidable impurity concervide. In intentional ingredient that the unavoidable impurity concervide. In intentional ingredient that the unavoidable impurity concerving the unavoidable impurity co	ntration of the	chemical subs	stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cl corporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fl tp://ul.com/global/eng/pages/offerings/industries/chemicane protective "tubes" in which the specific product is ship	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla als/plastics/ oped are made from polyving in in this form concerning su lest of its knowledge and beli has been compiled based o rets and some information i e parts and the average wei	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concervide. In the semiconductor device and le reason to believe that the unavoidable impurity concervide. In the semiconductor of databases to a semiconductor of the semi	ntration of the obtain a test obtain a test old the packing incorporated's agy Incorporate vided by raw mand raw materi	report at semiconducto d cannot guar naterial supplies. I	stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cleorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 ftp://ul.com/global/eng/pages/offerings/industries/chemicane protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Icrochip Technology Incorporated believes the information eir original packing materials is true and correct to the beampleteness and accuracy of data in this form because it formation is often protected from disclosure as trade sec provided only as estimates of the average weight of these	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla als/plastics/ oped are made from polyving in in this form concerning su lest of its knowledge and belichas been compiled based on tets and some information re e parts and the average welled within silicon devices (silicon devices (silicon devices)	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concervide. In the semiconductor device and le reason to believe that the unavoidable impurity concervide. In the semiconductor of databases to a semiconductor of the semi	ntration of the oo obtain a test old the packing ncorporated's sylncorporate vided by raw mand raw materithese estimate:	report at I slip on the or semiconducto d cannot guar naterial suppli al suppliers. I s do not inclu- sive, limited p	stance, if uter box and r devices in antee the ers. Supplier nformation de trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cleorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fitp://ul.com/global/eng/pages/offerings/industries/chemica ne protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the informatio eir original packing materials is true and correct to the be ompleteness and accuracy of data in this form because it formation is often protected from disclosure as trade sec provided only as estimates of the average weight of the views of dopants, metals, and non-metal materials containe icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla als/plastics/ oped are made from polyving in in this form concerning si sist of its knowledge and beli has been compiled based o rets and some information re e parts and the average weight ad within silicon devices (sill varranty, express or implied and its subsidiaries are con- changes to Material Content he users' reliance on the interest.	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conceivide. In intentional ingredient the unavoidable impurity conceivide. In it is is in the intention of the inten	o obtain a test old the packing ncorporated's s gy Incorporate vided by raw n and raw mater 'hese estimate: tion. The exclu sale. These are	report at I slip on the or semiconducto d cannot guar aterial suppli ial suppliers. I s do not inclu- sive, limited p p provided in I	stance, if uter box and r devices in antee the ers. Supplier information de trace roduct Microchip's al or	0.36	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.54
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cleorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 fitp://ul.com/global/eng/pages/offerings/industries/chemicate protective "tubes" in which the specific product is ship train "reels" may be made from PVC plastic. Incrochip Technology Incorporated believes the information eir original packing materials is true and correct to the besumpleteness and accuracy of data in this form because it formation is often protected from disclosure as trade see provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained in the control of the provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained in the control of the provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained in the provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained in the provided only as estimates of the average weight of the second order acknowledgement, and invoices. In the provided only users of the parties as a result of the provide of the provided only as estimated or the provided o	hemical substance is NOT a locument, there is no credib ny regulatory scheme world- lammability standard for pla als/plastics/ oped are made from polyving in in this form concerning si sist of its knowledge and beli has been compiled based o rets and some information re e parts and the average weight ad within silicon devices (sill varranty, express or implied and its subsidiaries are con- changes to Material Content he users' reliance on the interest.	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conceivide. In intentional ingredient the unavoidable impurity conceivide. In it is is in the intention of the inten	o obtain a test old the packing ncorporated's s gy Incorporate vided by raw n and raw mater 'hese estimate: tion. The exclu sale. These are	report at I slip on the or semiconducto d cannot guar aterial suppli ial suppliers. I s do not inclu- sive, limited p p provided in I	stance, if uter box and r devices in antee the ers. Supplier information de trace roduct Microchip's al or	0.36	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.54

MQ 20 QFN 11:02 AM : 8/29/2013

MICROCHIP				nination Base Copper Alloy				nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Dev	ice Type: 28 QFN 5x5x0.	9mm (P7)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	mag	28.43	(mg) Total	Mold Compound	% ot Total Weight	42.75
Silica, fused	60676-86-0	Mold Compound	38,475	25.586	384.750		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound	2.073	1.379	20,734		Epoxy Resin	500-033-5	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.073	1.379	20,734		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.128	0.085	1,283		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	42.249	28.096	422,489			Total	100.00	ļ
Tin	7440-31-5	Lead Frame	0.108	0.072	1,084	28.84	(mg) Total	Lead Frame	% of Total Weight	43.37
Silver	7440-22-4	Lead Frame	0.826	0.549	8,262		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.078	0.052	781		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.108	0.072	1,084		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.076	0.716	10,764		Zinc	7440-66-6	0.18	
Epoxy Resin	Trade Secret	Die Attach	0.304	0.202	3,036		Chromium	7440-47-3	0.25	
Silicon	7440-21-3	Chip (Die)	8.950	5.952	89,500			Total	100.00	
Gold	7440-57-5	Wire Bond	1.380	0.918	13,800	0.92	(mg) Total	Die Attach	% of Total Weight	1.38
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.170	1.443	21,700		Silver	7440-22-4	78.00	
		TOTALS:	100.000	66.500	1,000,000		Epoxy Resin	Trade Secret	22.00	
		g Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS	S Recast Dire	ective) and wit	th EU Directive	5.95	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	8.95
his semiconductor device and its homogenous material 02/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verifications.	s comply with EU Directive 20	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS	S Recast Dire	ective) and wi	th EU Directive	5.95	(mg) Total Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	8.95
02/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verificated in the list above, the corporated's knowledge and belief as of the date of this	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a document, there is no credib	20/295/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	to the best o	of Microchip To	echnology	5.95		Chip (Die)	% of Total Weight	8.95
02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verifical chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any solding compounds used by Microchip meet the UL94 Vi	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a document, there is no credib regulatory scheme world-wide of lammability standard for pla	20/295/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	to the best o	of Microchip To chemical sub	echnology	5.95 0.92		Chip (Die) 7440-21-3	% of Total Weight	1.38
02/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any solding compounds used by Microchip meet the UL94 Vtp://ul.com/global/eng/pages/offerings/industries/chemine protective "tubes" in which the specific product is si	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a s document, there is no credib regulatory scheme world-wide 0 flammability standard for pla cals/plastics/	O2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent.	to the best of the obtain a tes	of Microchip To chemical sub t report at	echnology ostance, if any,		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
02/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verifical chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any including compounds used by Microchip meet the UL94 Vitp://ul.com/global/eng/pages/offerings/industries/chem the protective "tubes" in which the specific product is sintain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informateir original packing materials is true and correct to the impleteness and accuracy of data in this form because formation is often protected from disclosure as trade solvided only as estimates of the average weight of these	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a s document, there is no credib regulatory scheme world-wide 0 flammability standard for pla cals/plastics/ nipped are made from polyving tion in this form concerning st best of its knowledge and beli it has been compiled based o crets and some information r p parts and the average weigh	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. Stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology Interpretation of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets proving ynot have been provided by subcontract assemblers at tof anticipated significant toxic metals components. These	to the best of tration of the obtain a test obtain a test of the packin corporated's y Incorporate trided by raw and raw mater.	of Microchip To e chemical sub- treport at g slip on the of semiconducted cannot gua material supp rial suppliers.	echnology stance, if any, outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
onz/53/EC (End-of-Life Vehicles (ELV) Directive). In publiance with the above EU Directives has been verificated and chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any is olding compounds used by Microchip meet the UL94 Vitp://ul.com/global/eng/pages/offerings/industries/chem he protective "tubes" in which the specific product is significant in "reels" may be made from PVC plastic. In original packing materials is true and correct to the impleteness and accuracy of data in this form because formation is often protected from disclosure as trade so vided only as estimates of the average weight of thes dopants, metals, and non-metal materials contained we incrochip Technology Incorporated does not provide any	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a comment, there is no credib regulatory scheme world-wide of flammability standard for pla ccals/plastics/ nipped are made from polyving tion in this form concerning so best of its knowledge and beli it has been compiled based o ccrets and some information r oparts and the average weigh tithin silicon devices (silicon IC r warranty, express or implied	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. Stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology Interanges provided in Material Safety Data Sheets proving ynot have been provided by subcontract assemblers at of anticipated significant toxic metals components. Thes	to the best of tration of the potential of the packin corporated's y Incorporate dided by raw and raw mates e estimates	of Microchip To e chemical sub- treport at g slip on the co- semiconducted cannot gua material suppiral suppliers. do not include usive, limited	echnology ostance, if any, outer box and or devices in rantee the liers. Supplier Information is e trace levels		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
nonliance with the above EU Directives has been verified themical substance is absent from the list above, the corporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any in piding compounds used by Microchip meet the UL94 Vip://ul.com/global/eng/pages/offerings/industries/cheming e protective "tubes" in which the specific product is sittain "reels" may be made from PVC plastic. Corochip Technology Incorporated believes the information original packing materials is true and correct to the impleteness and accuracy of data in this form because ormation is often protected from disclosure as trade is ovided only as estimates of the average weight of thes dopants, metals, and non-metal materials contained we crochip Technology Incorporated does not provide any irranties provided by Microchip Technology Incorporato otations, sales order acknowledgement, and invoices.	s comply with EU Directive 20 ed via internal design controls chemical substance is NOT a comment, there is no credib regulatory scheme world-wide of lammability standard for pla ccals/plastics/ nipped are made from polyving tion in this form concerning so best of its knowledge and beli it has been compiled based o crets and some information r parts and the average weigh tithin silicon devices (silicon IC r warranty, express or implied ed and its subsidiaries are con or changes to Material Content of the users' reliance on the int	OZ/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS oz/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS oz/95/EC (RoHS Directive), and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. Stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to hole ubstances restricted by RoHS in Microchip Technology Intervals of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets proving yn thave been provided by subcontract assemblers at of anticipated significant toxic metals components. These in the finished parts.	to the best of tration of the position of the position at test of the packin corporated by raw mate se estimates on. The exclusion. The exclusion of the packing are to rindirect or indirect or indirect or the position of the packing are to rindirect or the packing are to rindirect or the packing of the packing are the packing of the p	of Microchip To e chemical sub- treport at g slip on the of semiconducted cannot gua material supp rial suppliers. do not includ- usive, limited e provided in ct, consequen	echnology obtained, if any, obtained, if any, obtained by and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's tial or	0.92	Doped Silicon (mg) Total Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	1.38

28 QFN 11:02 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: MI 28 (Lead	OFN eve mm (MAMM)		nation Base A	- ,		•	ogeneous Materials: .g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Centiconductor Device	Type: INE 20 (Lead,	"Contained In"	% Total		1					
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	52.76	(mg) Total	Mold Compound	% ot Total Weight	51.93
Silica, fused	60676-86-0	Mold Compound	46.737	47.485	467,370		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.519	2.559	25,186	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.519	2.559	25,186		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.156	0.158	1,558		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	37.885	38.491	378,847			Total	100.00	•
Tin	7440-31-5	Lead Frame	0.097	0.099	972	39.51	(mg) Total	Lead Frame	% of Total Weight	38.89
Silver	7440-22-4	Lead Frame	0.741	0.753	7,409		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.070	0.071	700		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.097	0.099	972		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.413	0.420	4,134		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.095	0.097	954		Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.011	0.011	106			Total		
Heterocyclic organic compound	Trade Secret	Die Attach	0.011	0.011	106	0.54	(mg) Total	Die Attach	% of Total Weight	0.53
Silicon	7440-21-3	Chip (Die)	3.290	3.343	32,900		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.950	0.965	9,500		Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.410	4.481	44,100		Treated silica	Trade Secret	2	
		TOTALS:	100.000	101.600	1,000,000	He	eterocyclic organic compou	Trade Secret	2	
	0.1016	g Total Mass						Total	100.00	
This semiconductor device and its homogenous materials of Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 2	2002/95/EC (RoHS Directive), EU Directive 2011/65/	/EU (RoHS Rec	ast Directive)	and with EU	3.34	Total (mg)	Chip (Die)	% of Total Weight	3.29
Compliance with the above EU Directives has been verified v	ia internal design contro	ls, supplier declarations, and /or analytical test da	ata.				Doped Silicon	7440-21-3	100	
If a chemical substance is absent from the list above, the che Technology Incorporated's knowledge and belief as of the di chemical substance, if any, is not below the threshold of reg	ate of this document, the ulatory concern for any r	ere is no credible reason to believe that the unavoi-						Total	100.00	
Molding compounds used by Microchip meet the UL94 V0 fla	mmability standard for r									
http://ul.com/global/eng/pages/offerings/industries/chemical		plastics. You can access the UL iQTM family of dat	tabases to obta	ain a test repo	ort at	0.97	(mg) Total	Wire Bond	% of Total Weight	0.95
	s/plastics/ ped are made from polyvi	,				0.97	(mg) Total Doped Gold	Wire Bond 7440-57-5	% of Total Weight	0.95
http://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is shipp outer box and certain "reels" may be made from PVC plastic Microchip Technology Incorporated believes the information devices in their original packing materials is true and correct cannot guarantee the completeness and accuracy of data in raw material suppliers. Supplier information is often protecte and raw material suppliers. Information is provided only as e components. These estimates do not include trace levels of	es/plastics/ ped are made from polyvi in this form concerning t to the best of its knowle this form because it has ed from disclosure as tra estimates of the average dopants, metals, and no	substances restricted by RoHS in Microchip Tech adge and belief, as of the date listed in this form. In been compiled based on the ranges provided in N de secrets and some information may not have be weight of these parts and the average weight of ar n-metal materials contained within silicon devices	nnology Incorp Microchip Tech Material Safety een provided by nticipated sign s (silicon IC) in	e packing slip orated's semi nology Incorp Data Sheets p y subcontract ificant toxic n the finished p	conductor porated provided by assemblers netals parts.	0.97	Doped Gold	7440-57-5 Total	100	0.95
http://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is shipp outer box and certain "reels" may be made from PVC plastic Microchip Technology Incorporated believes the information devices in their original packing materials is true and correct cannot guarantee the completeness and accuracy of data in raw material suppliers. Supplier information is often protecte and raw material suppliers. Information is provided only as e components. These estimates do not include trace levels of Microchip Technology Incorporated does not provide any we product warranties provided by Microchip Technology Incorp	s/plastics/ bed are made from polyvi in this form concerning to the best of its knowle this form because it has ed from disclosure as tra estimates of the average dopants, metals, and nor arranty, express or implie porated and its subsidiar ement, and invoices.	substances restricted by RoHS in Microchip Techedge and belief, as of the date listed in this form. No been compiled based on the ranges provided in Mide secrets and some information may not have be weight of these parts and the average weight of an an-metal materials contained within silicon devices and, with respect to the information provided in this ries are contained in Microchip's standard terms a	nnology Incorp Microchip Tech Material Safety een provided by nticipated sign s (silicon IC) in s declaration. T and conditions	e packing slip orated's semi nology Incorp Data Sheets p y subcontract ifficant toxic n the finished p The exclusive, of sale. These	conductor corated provided by a sesemblers netals parts.	0.97	Doped Gold	7440-57-5	100	
http://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is shipp outer box and certain "reels" may be made from PVC plastic Microchip Technology Incorporated believes the information devices in their original packing materials is true and correct cannot guarantee the completeness and accuracy of data in raw material suppliers. Supplier information is often protecte and raw material suppliers. Information is provided only as e components. These estimates do not include trace levels of Microchip Technology Incorporated does not provide any wa product warranties provided by Microchip Technology Incorp	s/plastics/ ped are made from polyvi in this form concerning to the best of its knowle this form because it has ad from disclosure as tra estimates of the average dopants, metals, and nor arranty, express or implie porated and its subsidiar ement, and invoices. hanges to Material Conte the users' reliance on th	substances restricted by RoHS in Microchip Tech adge and belief, as of the date listed in this form. In been compiled based on the ranges provided in N de secrets and some information may not have be weight of these parts and the average weight of an n-metal materials contained within silicon devices and, with respect to the information provided in this ries are contained in Microchip's standard terms a ent Declarations and shall not be liable for any dan	nnology Incorp Microchip Tech Material Safety een provided by inticipated sign is (silicon IC) in s declaration. T and conditions	e packing slip orated's semi inology Incorp Data Sheets p y subcontract fificant toxic in the finished p The exclusive, of sale. These or indirect, con	conductor corated provided by assemblers netals parts.		Doped Gold	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 7440-31-5	100.00 100.00 % of Total Weight	
Intp://ul.com/global/eng/pages/offerings/industries/chemical The protective "tubes" in which the specific product is shipp outer box and certain "reels" may be made from PVC plastic dicrochip Technology Incorporated believes the information levices in their original packing materials is true and correct actions to guarantee the completeness and accuracy of data in an amount at suppliers. Supplier information is often protected and raw material suppliers. Information is provided only as ecomponents. These estimates do not include trace levels of a dicrochip Technology Incorporated does not provide any was product warranties provided by Microchip Technology Incorporated in Microchip's quotations, sales order acknowledge dicrochip disclaims any duty to notify users of updates or cortherwise, suffered by users or third parties as a result of or otherwise, suffered by users or third parties as a result of	s/plastics/ ped are made from polyvi in this form concerning to the best of its knowle this form because it has ad from disclosure as tra estimates of the average dopants, metals, and nor arranty, express or implie porated and its subsidiar ement, and invoices. hanges to Material Conte the users' reliance on th	substances restricted by RoHS in Microchip Tech adge and belief, as of the date listed in this form. In been compiled based on the ranges provided in N de secrets and some information may not have be weight of these parts and the average weight of an n-metal materials contained within silicon devices and, with respect to the information provided in this ries are contained in Microchip's standard terms a ent Declarations and shall not be liable for any dan	nnology Incorp Microchip Tech Material Safety een provided by inticipated sign is (silicon IC) in s declaration. T and conditions	e packing slip orated's semi inology Incorp Data Sheets p y subcontract fificant toxic in the finished p The exclusive, of sale. These or indirect, con	conductor corated provided by assemblers netals parts.		Doped Gold (mg) Total	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100.00 100.00 % of Total Weight	

ML 28 QFN 11:02 AM : 8/29/2013

Semiconductor Device Type:	ML or MM	28 (Lead) QFN-S 6x6mm (M2/MB)		nation Base A pper Alloy (C	-		•	nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	1	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	52.77	(mg) Total	Mold Compound	% ot Total Weight	51.94
Silica, fused	60676-86-0	Mold Compound	46.746	47.494	467,460		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.519	2.559	25,191	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.519	2.559	25,191		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.156	0.158	1,558		Carbon Black	1333-86-4	0.30	<u>]</u>
Copper	7440-50-8	Lead Frame	37.145	37.739	371,450			Total		
Iron	7439-89-6	Lead Frame	0.914	0.928	9,137	39.50	(mg) Total	Lead Frame	% of Total Weight	38.88
Silver	7440-22-4	Lead Frame	0.741	0.753	7,407		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.049	0.049	486		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.032	0.033	321		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.391	0.397	3,911		Zinc	7440-66-6	0.13	<u> </u>
Epoxy Resin	9003-36-5	Die Attach	0.100	0.101	996		Phosphorous	7723-14-0	0.08	<u> </u>
t-Butyl phenyl glycidyl ether	3101-60-8	Die Attach	0.033	0.034	334			Total		
Phenolic hardener	92-88-6	Die Attach	0.002	0.002	16	0.54	(mg) Total	Die Attach	% of Total Weight	0.53
Butyl cellosolve acetate	112-07-2	Die Attach	0.004	0.004	42		Silver	7440-22-4	74	
Silicon	7440-21-3	Chip (Die)	3.290	3.343	32,900		Epoxy Resin	9003-36-5	19	
Gold	7440-57-5	Wire Bond	0.950	0.965	9,500	t- <u>l</u>	Butyl phenyl glycidyl ether	3101-60-8	6	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.410	4.481	44,100		Phenolic hardener	92-88-6	0	
		TOTALS:	100.000	101.600	1,000,000		Butyl cellosolve acetate	112-07-2 Total	1 100.00	<u>]</u>
emiconductor device and its homogenous materials comply wive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).			IS Recast Direc	ctive) and with	EU	3.34	Total (mg)	Chip (Die)	% of Total Weight	3.29
	nal design control substance is NOT , there is no credi	ls, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer	, to the best of	Microchip Teo	chnology	3.34	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via inter emical substance is absent from the list above, the chemical sociated's knowledge and belief as of the date of this document	nal design control substance is NOT , there is no credi tory scheme work	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concer d-wide.	, to the best of ntration of the	Microchip Tec chemical subs	chnology	0.97	, 0,	7440-21-3	100	
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via inter emical substance is absent from the list above, the chemical sorated's knowledge and belief as of the date of this document is not below the threshold of regulatory concern for any regula ng compounds used by Microchip meet the UL94 V0 flammabil	nal design control substance is NOT to there is no creditory scheme work ity standard for post	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conceit- d-wide. lastics. You can access the UL iQTM family of databases to	, to the best of ntration of the o obtain a test	Microchip Tec chemical subs report at	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via inter emical substance is absent from the list above, the chemical : orated's knowledge and belief as of the date of this document is not below the threshold of regulatory concern for any regula go compounds used by Microchip meet the UL94 V0 flammabi ul.com/global/eng/pages/offerings/industries/chemicals/plastic rotective "tubes" in which the specific product is shipped are	nal design control substance is NOT , there is no credi tory scheme work ity standard for p ss/ made from polyvi form concerning s knowledge and be a compiled based some information nd the average we	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases the concern of the con	, to the best of ntration of the o obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materi	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara material supplie	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.95
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via inter emical substance is absent from the list above, the chemical storated's knowledge and belief as of the date of this document is not below the threshold of regulatory concern for any regula ing compounds used by Microchip meet the UL94 V0 flammabil iul.com/global/eng/pages/offerings/industries/chemicals/plastic rotective "tubes" in which the specific product is shipped are in "reels" may be made from PVC plastic. chip Technology Incorporated believes the information in this virginal packing materials is true and correct to the best of its eteness and accuracy of data in this form because it has beer nation is often protected from disclosure as trade secrets and vided only as estimates of the average weight of these parts a	nal design control substance is NOT , there is no credi tory scheme work ity standard for p ss/ made from polyvi form concerning s knowledge and be a compiled based some information at the average we sillicon devices (s express or implie	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conceid-wide. lastics. You can access the UL iQTM family of databases the inverse of the in	, to the best of ntration of the coordinates of the packing accorporated's say Incorporated vided by raw mand raw materi hese estimate:	Microchip Tecchemical substreport at slip on the outserniconductor d cannot guaraterial suppliers. It is do not including sive, limited pi	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	. 0.95
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via inter emical substance is absent from the list above, the chemical is corated's knowledge and belief as of the date of this document is not below the threshold of regulatory concern for any regula ng compounds used by Microchip meet the UL94 V0 flammabil ul.com/global/eng/pages/offerings/industries/chemicals/plastic rotective "tubes" in which the specific product is shipped are n "reels" may be made from PVC plastic. chip Technology Incorporated believes the information in this virginal packing materials is true and correct to the best of its eteness and accuracy of data in this form because it has beer vaided only as estimates of the average weight of these parts a of dopants, metals, and non-metal materials contained within chip Technology Incorporated does not provide any warranty, this Technology Incorporated and its chip Technology Incorporated and its	nal design control substance is NOT , there is no credi tory scheme work ity standard for pi ss/ made from polyvi form concerning s knowledge and be compiled based some information nd the average ws silicon devices (s express or implie subsidiaries are co to Material Contei	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conceid-divide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic in the lastic	, to the best of ntration of the coordinates of the packing ncorporated's syllocorporated yield by raw mand raw materi hese estimates ition. The exclusion. The exclusion. The exclusion of the packing are the coordinates of the packing and the packing are the packing and the packing are the packing and the packing are	Microchip Tecchemical substreport at slip on the outstanding of cannot guaraterial suppliers. It is do not include sive, limited preprovided in Marconsequentia, consequential, and substreport of the consequential substruction of the consequenti	chnology stance, if atter box and r devices in antee the ers. Supplier nformation le trace roduct flicrochip's	0.97	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100	0.95

ML MM 28 QFN-S 11:02 AM : 8/29/2013

MICROCHIP Semiconductor Device	ce Type: ML 40 (Lead) C	DFN 6y6y0 9mm (S3)		ation Base A oper Alloy (C	. ,		•	geneous Materials: g. pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Ociniconductor Bevic	C Type. INL 40 (Lead) G	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	45.49	(mg) Total	Mold Compound	% ot Total Weight	45.04
Silica, fused	60676-86-0	Mold Compound	40.536	40.941	405,360		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.184	2.206	21,844	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.184	2.206	21,844		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.135	0.136	1,351	L	Carbon Black	1333-86-4	0.30	1
Copper	7440-50-8	Lead Frame	46.925	47.394	469,248			Total	100.00	
Tin	7440-31-5	Lead Frame	0.120	0.122	1,204	48.65	(mg) Total	Lead Frame	% of Total Weight	t 48.17
Silver	7440-22-4	Lead Frame	0.918	0.927	9,176		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.087	0.088	867		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.120	0.122	1,204		Silver	7440-22-4	1.91	1
Silver	7440-22-4	Die Attach Die Attach	0.226 0.052	0.228 0.053	2,262		Zinc Chromium	7440-66-6 7440-47-3	0.18	
Acrylate resins Proprietary	Trade Secret				522	<u>L</u>	Chromium		*	
Treated silica	Trade Secret	Die Attach	0.006	0.006	58			Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.006	0.006	58	0.29	(mg) Total	Die Attach	% of Total Weight	0.29
Silicon	7440-21-3	Chip (Die)	2.720	2.747	27,200	L	Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.860	0.869	8,600	4	Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5 PI	ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.920 100.000	2.949 101.000	29,200 1.000.000	L	Treated silica	Trade Secret	2	1
		TOTALS:	100.000	101.000	1,000,000	Heter	ocyclic organic compound	Trade Secret Total	2	
porated's knowledge and belief as of the date of this	chemical substance is NOT an document, there is no credible	supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen					Doped Silicon	7440-21-3 Total	100 100.00	
//ul.com/global/eng/pages/offerings/industries/chemic	flammability standard for plas cals/plastics/	tics. You can access the UL iQTM family of databases to		•		0.87	(mg) Total	Wire Bond	% of Total Weight	0.86
protective "tubes" in which the specific product is shi in "reels" may be made from PVC plastic.	pped are made from polyvinyl	chloride (PVC) plastic. "Window envelopes" used to hol	ld the packing	slip on the ou	ter box and		Doped Gold	7440-57-5	100	
original packing materials is true and correct to the b pleteness and accuracy of data in this form because it mation is often protected from disclosure as trade sec	est of its knowledge and belief thas been compiled based on crets and some information ma parts and the average weight of	ostances restricted by RoHS in Microchip Technology In i, as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provi ay not have been provided by subcontract assemblers a of anticipated significant toxic metals components. Thes in the finished parts.	y Incorporated ided by raw ma nd raw materia	cannot guara sterial supplier Il suppliers. In	ntee the rs. Supplier formation is	E		Total	100.00	7
		with respect to the information provided in this declarati ained in Microchip's standard terms and conditions of s				2.95	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	1 2.92
	the users' reliance on the infor	Declarations and shall not be liable for any damages, dir mation in Material Content Declarations (MCD) or indep					Tin	7440-31-5	100.00	
						<u> </u>		Total	100.00	= 1

ML 40 QFN 11:02 AM : 8/29/2013

100.000

101.000

MICROCHIP				nation Base A	•			ogeneous Materials: .g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	Type: ML 44 (Lead	QFN 8x8x0.9 mm (T3 / TR)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	75.12	(mg) Total	Mold Compound	% ot Total Weight	39.87
Silica, fused	60676-86-0	Mold Compound	35.883	67.604	358,830		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	1.934	3.643	19,337	Epoxy	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	1.934	3.643	19,337		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.120	0.225	1,196		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	47.903	90.248	479,025			Total	100.00	
Iron	7439-89-6	Lead Frame	1.178	2.220	11,783	94.46	(mg) Total	Lead Frame	% of Total Weight	50.14
Silver	7440-22-4	Lead Frame	0.955	1.800	9,552		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.063	0.118	627		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.041	0.078	414		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.186	2.234	11,856		Zinc	7440-66-6	0.13	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.274	0.515	2,736		Phosphorous	7723-14-0	0.08	<u>]</u>
Treated silica	Trade Secret	Die Attach	0.030	0.057	304			Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.030	0.057	304	2.86	(mg) Total	Die Attach	% of Total Weight	1.52
Silicon	7440-21-3	Chip (Die)	4.280	8.064	42,800		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.480	0.904	4,800	/	Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.710	6.990	37,100		Treated silica	Trade Secret	2	
		TOTALS:	100.000	188.400	1,000,000	Heter	ocyclic organic compound	Trade Secret	2	<u>J</u>
	0.1884	g Total Mass						Total	100.00	
		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	dS Recast Dire	ctive) and with	EU					
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified		, , ,	4S Recast Dire	ective) and with	EU	8.06	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	4.28
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified	via internal design control	s, supplier declarations, and /or analytical test data.		ŕ		8.06	,	7440-21-3	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an	via internal design control hemical substance is NOT ocument, there is no credi by regulatory scheme work	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	l, to the best of ntration of the	f Microchip Te chemical subs	chnology	8.06	,			
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this d	via internal design control hemical substance is NOT ocument, there is no credi by regulatory scheme work lammability standard for pl	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	l, to the best of ntration of the	f Microchip Te chemical subs	chnology	0.90	,	7440-21-3	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this duny, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 file.	via internal design control hemical substance is NOT ocument, there is no credi by regulatory scheme work lammability standard for pl ls/plastics/	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce 1-wide. astics. You can access the UL iQTM family of databases to the control of the c	I, to the best of ntration of the	f Microchip Te chemical subs	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this duny, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemica	via internal design control hemical substance is NOT ocument, there is no credity regulatory scheme work lammability standard for pills/plastics/ upped are made from polyvian in this form concerning set of its knowledge and be has been compiled based rets and some information e parts and the average we	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases the street of the substances restricted by RoHS in Microchip Technology Is dief, as of the date listed in this form. Microchip Technoloon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers sight of anticipated significant toxic metals components. 1	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate yided by raw n and raw mater	f Microchip Techemical substance of the suppliers. It is suppliers. It	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon	7440-21-3 Total	100 100.00 % of Total Weight	0.48
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the cloorporated's knowledge and belief as of the date of this d uny, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 fl thtp://ul.com/global/eng/pages/offerings/industries/chemica/the protective "tubes" in which the specific product is ship tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatio heir original packing materials is true and correct to the becompleteness and accuracy of data in this form because it information is often protected from disclosure as trade sects provided only as estimates of the average weight of these	via internal design control hemical substance is NOT ocument, there is no credity regulatory scheme work lammability standard for plas/plastics/ oped are made from polyvian in this form concerning sest of its knowledge and be has been compiled based rets and some information e parts and the average we did within silicon devices (searranty, express or implied	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. astics. You can access the UL iQTM family of databases in the control of the co	I, to the best of intration of the so obtain a test old the packing incorporated's gy Incorporate wided by raw n and raw mater These estimate	f Microchip Techemical substance of the control of	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.48
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this dinny, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 Volity (Light). The protective "tubes" in which the specific product is ship tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatio heir original packing materials is true and correct to the be sompleteness and accuracy of data in this form because it information is often protected from disclosure as trade sects provided only as estimates of the average weight of these evels of dopants, metals, and non-metal materials contained Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated warranties provided by Microchip Technology Incorporated warranties provided by Microchip Technology Incorporated	via internal design control hemical substance is NOT ocument, there is no credity regulatory scheme work lammability standard for pills/plastics/ upped are made from polyviant in this form concerning sets of its knowledge and behas been compiled based rets and some information e parts and the average weld within silicon devices (swarranty, express or implied and its subsidiaries are conchanges to Material Contente users' reliance on the line occurrence.	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. In the lastic is the la	I, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate vided by raw in and raw mater These estimate tion. The exclusiale. These are	f Microchip Techemical substance of the control of	chnology stance, if uter box and r devices in antee the resultance the formation de trace roduct flicrochip's	0.90	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.48
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the cloorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemica/the protective "tubes" in which the specific product is ship tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the becompleteness and accuracy of data in this form because it information is often protected from disclosure as trade sects provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or otherwise, suffered by users or third parties as a result of the support of the suppor	via internal design control hemical substance is NOT ocument, there is no credity regulatory scheme work lammability standard for pills/plastics/ upped are made from polyviant in this form concerning sets of its knowledge and behas been compiled based rets and some information e parts and the average weld within silicon devices (swarranty, express or implied and its subsidiaries are conchanges to Material Contente users' reliance on the line occurrence.	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. In the lastic is the la	I, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate vided by raw in and raw mater These estimate tion. The exclusiale. These are	f Microchip Techemical substance of the control of	chnology stance, if uter box and r devices in antee the resultance the formation de trace roduct flicrochip's	0.90	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	3.71

ML 44 QFN 11:03 AM : 8/29/2013

MICROCHIP Semiconductor Device Type	ne: HZH - HN 48	S VOFN 7x7xn 9 (RS/Y3)		nation Base A			Package Homo	geneous Materials		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	70.49	(mg) Total	Mold Compound	% ot Total Weight	
Silica, vitreous	60676-86-0	Mold Compound	47.124	62.911	471.240		Silica, vitreous	60676-86-0	89.25	1
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.047	4.067	30.466		Epoxy Resin	Trade Secret	5.77	
Phenolic Resin (No Br / CL SbO3. No diantimony trioxide)	Trade Secret	Mold Compound	2.492	3.327	24.922		Phenolic Resin	Trade Secret	4.72	
Carbon Black	1333-86-4	Mold Compound	0.137	0.183	1,373		Carbon Black	1333-86-4	0.26	i
Copper	7440-50-8	Lead Frame	36.486	48.709	364,858			Total	100.00	4
Iron	7439-89-6	Lead Frame	0.897	1.198	8,975	50.98	(mg) Total	Lead Frame	% of Total Weight	38.19
Silver	7440-22-4	Lead Frame	0.728	0.971	7.275		Copper	7440-50-8	95.54	1
Zinc	7440-66-6	Lead Frame	0.048	0.064	477		Iron	7439-89-6	2.35	i
Phosphorous	7723-14-0	Lead Frame	0.032	0.042	315		Silver	7440-22-4	1.91	i
Silver	7440-22-4	Die Attach	0.600	0.801	6,000		Zinc	7440-66-6	0.13	1
Epoxy Resin	Trade secret	Die Attach	0.080	0.107	800		Phosphorous	7723-14-0	0.08	
Diluent	Trade secret	Die Attach	0.080	0.107	800			Total	100.00	•
Hardener	Trade secret	Die Attach	0.040	0.053	400	1.07	(mg) Total	Die Attach	% of Total Weight	0.8
Silicon	7440-21-3	Chip (Die)	5.720	7.636	57,200		Silver	7440-22-4	75	ĺ
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.941	1.256	9,409		Epoxy Resin	Trade secret	10	
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.029	0.039	291		Diluent	Trade secret	10	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.520	2.029	15,200		Hardener	Trade secret	5	
		TOTALS:	100.000	133.500	1,000,000			Total	100.00	_
	0.1335	a Total Mass				7.64	Total (mg)	Chip (Die)	% of Total Weight	5.72
unliance with the above EU Directives has been seeded at the le									100	
omphance with the above EU Directives has been verified via it	iternal design contro	els, supplier declarations, and /or analytical test data.						Total		ļ
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum	al substance is NOT ent, there is no cred	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent				1.29	(mg) Total	Total Wire Bond palladium coated copper (CuPd)		
. chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulato olding compounds used by Microchip meet the UL94 V0 flamm	al substance is NOT nent, there is no cred ory scheme world-wid ability standard for p	an intentional ingredient in the semiconductor device and, t ible reason to believe that the unavoidable impurity concent de.	ration of the o	hemical subs		1.29	(mg) Total	Wire Bond palladium coated	100.00	
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulato biding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/plate protective "tubes" in which the specific product is shipped a	eal substance is NOT nent, there is no cred ory scheme world-wid ability standard for p astics/	an intentional ingredient in the semiconductor device and, to the reason to believe that the unavoidable impurity concent de. Plastics. You can access the UL iQTM family of databases to	ration of the c	hemical subs	stance, if any,	1.29		Wire Bond palladium coated copper (CuPd)	100.00 % of Total Weight	
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulato olding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/plate protective "tubes" in which the specific product is shipped a ortain "reels" may be made from PVC plastic.	al substance is NOT lent, there is no cred ory scheme world-wid ability standard for p stics/ are made from polyvi this form concerning	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent de. plastics. You can access the UL iQTM family of databases to inyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Inc.	obtain a test of the packing corporated's s	hemical subs report at slip on the ou emiconductor	stance, if any, uter box and r devices in	1.29	Copper	Wire Bond palladium coated copper (CuPd) 7440-50-8	97	0.97
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulator loding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/pla te protective "tubes" in which the specific product is shipped a rtain "reels" may be made from PVC plastic. CCCOChip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets a ovided only as estimates of the average weight of these parts a	al substance is NOT ent, there is no cred rry scheme world-wic ability standard for p istics/ are made from polyvi his form concerning its knowledge and be een compiled based and some information and the average weig	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent de. plastics. You can access the UL iQTM family of databases to inyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Intelief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets proving may not have been provided by subcontract assemblers are that of anticipated significant toxic metals components. These	obtain a test of the packing corporated's s Incorporated ded by raw material	eport at slip on the ou emiconductor cannot guara aterial suppliers. In	stance, if any, uter box and r devices in untee the ers. Supplier nformation is	1.29	Copper	Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3	97	0.97
ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic incorporated's knowledge and belief as of the date of this document of below the threshold of regulatory concern for any regulator lodding compounds used by Microchip meet the UL94 V0 flamm ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plahe protective "tubes" in which the specific product is shipped a tertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of it ompleteness and accuracy of data in this form because it has beformation is often protected from disclosure as trade secrets a rovided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained within sill icircochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and i uotations, sales order acknowledgement, and invoices.	al substance is NOT ent, there is no cred ory scheme world-wic ability standard for p istics/ are made from polyvi his form concerning its knowledge and breen compiled based and some information and the average weig icon devices (silicon onty, express or implie	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent de. plastics. You can access the UL iQTM family of databases to inyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Intellef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets proving the may not have been provided by subcontract assemblers are that of anticipated significant toxic metals components. Thes IC) in the finished parts.	obtain a test of the coordinate of the packing corporated's solution of the coordinate of the coordinate of the coordinates of	report at slip on the ou emiconductor cannot guara aterial supplier al suppliers. In o not include to	iter box and r devices in intee the irs. Supplier information is trace levels	1.29	Copper	Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3	97	0.97
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulator loding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/pla the protective "tubes" in which the specific product is shipped a retain "reels" may be made from PVC plastic. Icrochip Technology Incorporated believes the information in the original packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets a ovided only as estimates of the average weight of these parts a dopants, metals, and non-metal materials contained within silicitorichip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and i inotations, sales order acknowledgement, and invoices.	al substance is NOT ent, there is no cred ry scheme world-wic ability standard for p stics/ are made from polyvi his form concerning its knowledge and be een compiled based nd some informatior and the average weig con devices (silicon htty, express or implie its subsidiaries are c ges to Material Conte	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent de. plastics. You can access the UL iQTM family of databases to inyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Intelef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provin may not have been provided by subcontract assemblers are just of anticipated significant toxic metals components. Thes IC) in the finished parts. Id, with respect to the information provided in this declaration ontained in Microchip's standard terms and conditions of saint Declarations and shall not be liable for any damages, directing the control of the	obtain a test of the coordinate of the packing corporated so Incorporated ded by raw mile e estimates do no. The exclusile. These are ct or indirect,	report at slip on the ou emiconductor cannot guara aterial supplie o not include to ive, limited pr provided in M consequentia	r devices in unter the res. Supplier formation is trace levels roduct licrochip's		Copper Palladium	Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	97 3	0.97
a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulato olding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/plane protective "tubes" in which the specific product is shipped a retain "reels" may be made from PVC plastic. icircochip Technology Incorporated believes the information in the ieir original packing materials is true and correct to the best of its original packing materials is true and correct to the best of its original packing materials is true and correct to the best of its original packing materials of the average weight of these parts of covided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained within sill icircochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and its contained within sill icircochip Technology Incorporated and its contained within self-	al substance is NOT ent, there is no cred ry scheme world-wic ability standard for p stics/ are made from polyvi his form concerning its knowledge and be een compiled based nd some informatior and the average weig con devices (silicon htty, express or implie its subsidiaries are c ges to Material Conte	an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concent de. plastics. You can access the UL iQTM family of databases to inyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Intelef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provin may not have been provided by subcontract assemblers are just of anticipated significant toxic metals components. Thes IC) in the finished parts. Id, with respect to the information provided in this declaration ontained in Microchip's standard terms and conditions of saint Declarations and shall not be liable for any damages, directing the control of the	obtain a test of the coordinate of the packing corporated so Incorporated ded by raw mile e estimates do no. The exclusile. These are ct or indirect,	report at slip on the ou emiconductor cannot guara aterial supplie o not include to ive, limited pr provided in M consequentia	r devices in unter the res. Supplier formation is trace levels roduct licrochip's		Copper Palladium (mg) Total	Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	97 3 100.00 % of Total Weight 97 100.00	1.52

AKZE 11:03 AM : 8/29/2013

Basic Substance CAS Number Silco, Inseed GEOGRAPH 1 1000 Compound A 1002 Compound A 1003 Select A 1003 Select	MICROCHIP Semiconductor Device	Type: MP 64/100	OEN cross comm. (B)		nation Base A	•			ogeneous Materials: .g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	Jenniconductor Device	Type. WIN 04 (Lead		% Total	1						63
Basic distribution Figure Place Figure Pla					l		10.41	(mg) Total	Mold Compound	% ot Total Weight	4.48
Epox Resin								, 0,			7
Principle Research Trade Secret Mold Compound 0,217 0,505 2,173 134 Curbon Black 1353-64 Mold Compound 0,013 0,013 0,014 134 Curbon Black 1353-64 Mold Compound 0,013 0,013 134 Curbon Black 1353-64 Mold Compound 0,013 0,013 134 Curbon Black 1353-64 Mold Compound 0,013 0,013 134 Curbon Black 1353-64 Cu											
Cathon Black											
Copper 7440-50-8 Lead Frame 0.105 0.244 1,550 97.41 (mg) Total Lead Frame 0.105 0.244 1,550 97.4											
Silver 7440-23-15 Lead Frame 0.0105 0.244 1.050 0 74.0 1.050 0.000 0.000								Carbon Black			<u>]</u>
Sheer 7440-22-4 Lead Frame 0.076 0.776 756	Copper					,			Total		
Zinc 17440-96-8 Lead Frame 0.076 0.176 1.760 756 Tin 17440-91-8 1.002 Frame 0.105 0.244 1.050 Silver 7440-22-4 1.016 Silver 7440-22-4 1.0			Lead Frame			1,050	97.61	(mg) Total	Lead Frame	% of Total Weight	42
Chromium 7440-47-3 Load Frame 0.106 0.24 1,050 Silver 7440-22-4 Die Mitsch 1,888 4,387 1,876 Arrykter resine Proprietary Trade Secret Die Attach 0.456 1,012 4,356 Treaded Silver Chromium 7440-47-3 0.25 Mitschool Congunid Trade Secret Die Attach 0.456 1,012 4,356 Mitschool Congunid Trade Secret Die Attach 0.456 1,012 4,356 Mitschool Congunid Trade Secret Die Attach 0.456 1,012 4,356 Mitschool Congunid Trade Secret Die Attach 0.456 1,012 4,356 Mitschool Congunid Trade Secret Die Attach 0.000 1,13,44 6,000 Mitschool Trade Silver Trade Secret Die Attach 0.000 1,13,44 6,000 Mitschool Trade Silver Trade Secret Die Attach 0.000 1,13,44 6,000 Mitschool Trade Silver Trade Secret Die Attach 0.000 1,13,44 6,000 Mitschool Trade Silver Trade Secret Die Attach 0.000 1,13,44 6,000 Mitschool Trade Silver Trade Secret Die Mitschool Trade Silver Trade Silver Trade Secret Die Mitschool Trade Silver Trade Secret Die Mitschool Trade Silver Trade Silv	Silver		Lead Frame	0.800	1.859	8,001		Copper	7440-50-8	97.42	
Silver 7440-224 Die Attach 1.888 4.387 18.876 Acrylate resins Proprietary Trade Secret Die Attach 0.438 1.012 4.586 Trained silica Trade Secret Die Attach 0.048 0.112 484 Helterocyclic organic compound 17ane Secret Die Attach 0.048 0.112 484 Silicon 7440-2713 Die Attach 0.048 0.112 484 Silicon 7440-2713 Die Attach 0.048 0.112 484 Silicon 7440-2713 Die Attach 0.000 1.394 0.000 Trade Secret Die Attach 0.048 0.112 484 Silicon 7440-2713 Die Attach 0.000 1.394 0.000 Trade Secret Die Compound of Trade Secret Die Die Compound of Die	Zinc	7440-66-6	Lead Frame	0.076	0.176	756		Tin	7440-31-5	0.25	
Acytete resins Proprietary Treated Secret Die Attach 0.438 1.1012 4.586 Treated Selective 1 Die Attach 1.0124 494 1.1012	Chromium	7440-47-3	Lead Frame	0.105	0.244	1,050		Silver	7440-22-4	1.91]
Treated silica Treated silica Treated Silica Networks of the Ration 1, 112 484 1, 112 48		7440-22-4	Die Attach	1.888	4.387	18,876		Zinc	7440-66-6	0.18	1
Treated silica Treated silica Treated Silica Networks of the Ration 1, 112 484 1, 112 48											1
Heterocyclic organic compound Trade Secret Die Attach 0.048 0.112 484 5.52 mml Total Die Attach 7440-21-3 Chip (Die) 0.000 13.044 60,000		Trade Secret	Die Attach	0.048	0.112	484			Total	100.00	4
Silicon 7440;21-3 Chip (Dip) 6,000 13,944 60,000 CG GOd 7440;57-5 Plang on external least (prat. Mater Tur) arrowated at 150°C to 1 page 14,130 102,558 441,300 CG Turol 14,130 102,558 1441,300 CG Turol							5.62	(mg) Total			
Continue							3.02				1 2.42
Tim 7440:31-5 Plating one external leads (prev) - Marks Tin / ammended at 1907/C for 1 feature 3 141,300 102.558 411,300 10.00.000 2 323.400 1,000,000 Total Weight 100.000 100.000 100.00000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000 100.00000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000 100.00000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000 100.00000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000 100.00000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000 100.0000000 100.000000 100.00000000											4
13.34 Total (mg) Chip (Cle) % of Total Weight 0.37 total Weight 0.37 total Weight 0.37 total Weight 0.37 total was a decuracy of data in this form because it has been compiled based on the ranges provided in Microchip Technology Incorporated data in this form because it has been compiled based on the ranges provided in Microchip Technology Incorporated data subcurance of the average weight of these parts and the average weight of these parts and the average weight of these parts and the average weight of microchip Technology Incorporated data in Microchip Technology Incorporated data in Microchip Technology Incorporated data in this form because it has been compiled based on the ranges provided in Microchip Technology Incorporated data in this form because it has been compiled, with respect to the information provided in Microchip Technology Incorporated data suppliers. Microchip Technology Incorporated data suppliers. Microchip Technology Incorporated data in this form because it has been compiled based on the ranges provided in Microchip Technology Incorporated suppliers. Microchip Technology Incorporated data suppliers. Microchip Technology Incorporated cannot guarantee the own and rest of the average weight of anticipated significant toxic metals components. These estimates do not include trace veics of depants, metals, and non-main anticipated parts. Plating on external leaded (pins) - Martin Ma											•
0.2324 g Total Mass 10.000 10.324 g Total Mass 10.000 10.325/EC (End-of-Life Vehicles (ELV) Directive) 10.325/EC (End-of-Life Vehicles) 10.325/EC (End-of-Life Vehicles)	IIII	7440-31-5					11-4				4
is semiconductor device and its homogenous materials comply with EU Directive 2002/39/EC (RoHS Directive). 13.94 Total (mg) Chip (Dio) % of Total Weight 6 compliance with the above EU Directive EU Directive 2002/39/EC (End-Of-Life Vehicles (ELV) Directive). 13.94 Total (mg) Chip (Dio) % of Total Weight 6 compliance with the above EU Directive 2002/39/EC (End-Of-Life Vehicles (ELV) Directive). 2 a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if vehicles (ELV) Directive). 2 (mg) Total Wire Bond % of Total Weight 0.97 total Weight 0.97 total Weight 0.97 total weight). 2 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 2 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 2 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 3 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 3 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 3 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 4 (mg) Total Wire Bond % of Total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 total Weight 0.97 total weight). 5 (mg) Total 100.00 total Weight 0.97 tota				100.000	232.400	1,000,000	петег	ocyclic organic compound			1
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if ny, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Ioliding compounds used by Microchip meet the UL94 V0 Hammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ he protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and rain "retals" may be made from PVC plastic. Total 100.00 Deped Gold 7/40-57-5 100 Plating on external leads (pins) - Matter Tin/ / annealed at 150°C for 1 hour arranties provided by Microchip Technology Incorporated and suppliers. Information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. In 7/40-31-5 100.00		0.2324	g Total Mass						I otal	100.00	
lolding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ he protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ertain "reels" may be made from PVC plastic. Doped Gold 7440-57-5 100	Compliance with the above EU Directives has been verified If a chemical substance is absent from the list above, the ch	nemical substance is NOT	an intentional ingredient in the semiconductor device and					,	7440-21-3	100]
ertain "reels" may be made from PVC plastic. Iticrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in neir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the office of the straight of the seem of the straight of the straight of the straight of the seem of the straight of the stra	any, is not below the threshold of regulatory concern for an Molding compounds used by Microchip meet the UL94 V0 fl	y regulatory scheme work	d-wide.			stance, ii	2.25	(mg) Total	Wire Bond	% of Total Weigh	0.97
licrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in being rolling packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace viewels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ilicrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. Ilicrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or	The protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic.	ped are made from polyvi	nyl chloride (PVC) plastic. "Window envelopes" used to ho	old the packing	slip on the ou	iter box and		Doped Gold	7440-57-5	100	
leads (pins) - Matte Tin/ /annealed at 150°C for Inhour. 102.56 (mg) Total leads (pins) - Matte Tin/ /annealed at 150°C for Inhour. 102.56 (mg) Total leads (pins) - Matte Tin/ /annealed at 150°C for Inhour. 44.13 44.13 44.13 44.13 44.13 44.13	their original packing materials is true and correct to the be completeness and accuracy of data in this form because it l information is often protected from disclosure as trade secr is provided only as estimates of the average weight of these	st of its knowledge and be has been compiled based rets and some information parts and the average we	lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers i gight of anticipated significant toxic metals components. T	gy Incorporate vided by raw n and raw mater	d cannot guara naterial supplical al suppliers. In	antee the ers. Supplier nformation			Total	100.00	.
therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or							102.56	(mg) Total	leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weigh	44.13
· · · · ·		ne users' reliance on the i						Tin			
Total 100.00								·	Total	100.00	ı

MR 64 QFN 11:03 AM : 8/29/2013

Halogen-Free

MICROCHIP Semiconductor Device 1	ype: MJ 24 (Lead)	QFN 4x4mm (J3)		nation Base A pper Alloy (C	•		•	ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			21.53	(mg) Total	Mold Compound	% ot Total Weight	48.78
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm					7
Silica, fused Epoxy Resin (NLP # 500-033-5)	60676-86-0	Mold Compound	43.902	19.374 1.044	439,020 23.658	-	Silica, fused	60676-86-0	90.00	4
Phenolic Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	2.366 2.366	1.044	23,658	Epoxy	Resin (NLP # 500-033-5) Phenolic Resin	Trade Secret	4.85 4.85	4
Carbon Black	1333-86-4	Mold Compound	0.146	0.065	1.463		Carbon Black	Trade Secret 1333-86-4	0.30	1
Copper	7440-50-8	Lead Frame	37.193	16.413	371.930		Carbon Black	1333-86-4 Total	100.00	<u> </u>
Tin	7440-31-5	Lead Frame	0.095	0.042	955	16.85	(mg) Total			
Silver	7440-31-5		0.095	0.042	7.273	16.85		Lead Frame	% of Total Weight	38.18
		Lead Frame		0.321			Copper	7440-50-8	97.42	4
Zinc Chromium	7440-66-6 7440-47-3	Lead Frame Lead Frame	0.069 0.095	0.030	687 955		Tin Silver	7440-31-5 7440-22-4	0.25 1.91	
	7440-47-3	Die Attach	0.095	0.042	9,672			7440-22-4		4
Silver Acrylate resins Proprietary	Trade Secret	Die Attach	0.967	0.427	2.232		Zinc Chromium	7440-66-6	0.18 0.25	1
Treated silica	Trade Secret	Die Attach	0.025	0.098	2,232		Chiomium	Total	100.00	Ш
Heterocyclic organic compound	Trade Secret	Die Attach	0.025	0.011	248	0.55	(mg) Total	Die Attach	% of Total Weight	
Silicon	7440-21-3	Chip (Die)	6.770	2.988	67.700	0.55	(ilig) rotal Silver	7440-22-4	78	1.24
Gold	7440-57-5	Wire Bond	0.750	0.331	7.500		Acrylate resins Proprietary	Trade Secret	18	1
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	4.280	1.889	42.800		Treated silica	Trade Secret	2	1
IIII	7440-31-3	TOTALS:	100.000	44.130	1.000.000	Hotor	ocyclic organic compound	Trade Secret	2	1
	0.0444	g Total Mass	100.000	44.130	1,000,000	rietei	ocyclic organic compound	Total	100.00	<u> </u>
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	HS Recast Dire	ctive) and with	EU	2.99	Total (mg)	Chip (Die)	% of Total Weight	6.77
		, , ,	HS Recast Dire	ctive) and with	EU	2.99	Total (mg)	7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che acorporated's knowledge and belief as of the date of this doo ny, is not below the threshold of regulatory concern for any	a internal design control mical substance is NOT ument, there is no credil regulatory scheme world	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide.	I, to the best of ntration of the	Microchip Tec chemical subs	chnology	2.99	Total (mg)	, , ,		
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this doc	a internal design control mical substance is NOT ument, there is no credil regulatory scheme world nmability standard for pl	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide.	I, to the best of ntration of the	Microchip Tec chemical subs	chnology	0.33	Total (mg)	7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this doo ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 VO flar	a internal design control mical substance is NOT ument, there is no credil regulatory scheme world nmability standard for pl plastics/	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. astics. You can access the UL iQTM family of databases	I, to the best of ntration of the to obtain a test	Microchip Tec chemical subs	chnology tance, if		, u	7440-21-3 Total	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che icorporated's knowledge and belief as of the date of this doc ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flar ttp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shippe	a internal design control mical substance is NOT ument, there is no credit regulatory scheme world mability standard for pl plastics/ and are made from polyvir on this form concerning s of its knowledge and be s been compiled based of s and some information rarts and the average we	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in the control of the con	i, to the best of ntration of the to obtain a test old the packing ncorporated's a gy Incorporate wided by raw n and raw materi	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie	chnology tance, if atter box and devices in intee the ers. Supplier information		(mg) Total	7440-21-3 Total	100 100.00 % of Total Weight	. 0.75
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che icorporated's knowledge and belief as of the date of this doc ny, is not below the threshold of regulatory concern for any solding compounds used by Microchip meet the UL94 V0 flar ttp://ul.com/global/eng/pages/offerings/industries/chemicals, he protective "tubes" in which the specific product is shipped retain "reels" may be made from PVC plastic. ilicrochip Technology Incorporated believes the information i leir original packing materials is true and correct to the best ompleteness and accuracy of data in this form because it ha formation is often protected from disclosure as trade secret provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of	a internal design control mical substance is NOT ument, there is no credit regulatory scheme worle mmability standard for pl plastics/ ed are made from polyvir on this form concerning s of its knowledge and be s been compiled based of s and some information parts and the average we within silicon devices (si ranty, express or implied	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in the control of the con	I, to the best of ntration of the to obtain a test old the packing ncorporated's a gy Incorporate vided by raw n and raw mater These estimate	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara aterial suppliers. Ir s do not include sive, limited pr	chnology tance, if ter box and devices in intee the ers. Supplier information le trace		(mg) Total JGPSSI (D02) (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.75
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified vi a chemical substance is absent from the list above, the che icorporated's knowledge and belief as of the date of this doo ny, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flar ttp://ul.com/global/eng/pages/offerings/industries/chemicals. he protective "tubes" in which the specific product is shippe retain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information i reterioriginal packing materials is true and correct to the best ompleteness and accuracy of data in this form because it ha formation is often protected from disclosure as trade secret provided only as estimates of the average weight of these proved vels of dopants, metals, and non-metal materials contained ilcrochip Technology Incorporated does not provide any war arranties provided by Microchip Technology Incorporated al	a internal design control mical substance is NOT ument, there is no credit regulatory scheme work nmability standard for pl plastics/ and are made from polyvir in this form concerning s of its knowledge and be s been compiled based of s and some information carts and the average we within silicon devices (si ranty, express or implied ind its subsidiaries are co	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, districts to the liable for any damages, districts and conditions and shall not be liable for any damages, districts.	I, to the best of ntration of the to obtain a test old the packing ncorporated's: gy Incorporate vided by raw n and raw mater in these estimate tion. The exclusale. These are irect or indirect	Microchip Tecchemical substance of the microl substance of the construction of the con	chnology tance, if devices in inntee the ers. Supplier information te trace	0.33	(mg) Total JGPSSI (D02) (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.75

MJ 24 QFN 11:03 AM : 8/29/2013

Semiconductor Devic	e Type: QU6E 06 (Lead) UC	DFN 3x1.6x0.55mm (QU)		nation Base opper Alloy (-		•	ogeneous Materials: g. pc boards, display:	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	1 1761 200 00 (2000) 00	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	1.36	(mg) Total	Mold Compound	% ot Total Weight	20.25
Silica, fused	60676-86-0	Mold Compound	18.225	1.221	182,250		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound	0.982	0.066	9,821		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	0.982	0.066	9,821		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.061	0.004	608		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	69.935	4.686	699,355			Total	100.00	
Nickel	7440-02-0	Lead Frame	1.865	0.125	18,651	4.92	(mg) Total	Lead Frame	% of Total Weight	73.43
Silicon	7440-21-3	Lead Frame	0.330	0.022	3,304		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.073	0.005	734		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	1.226	0.082	12,255		Silicon	7440-21-3	0.45	
Ag	7440-22-4	Die Attach	1.710	0.115	17,100		Magnesium	7439-95-4	0.10	
Epoxy resin	Trade secret	Die Attach	0.342	0.023	3,420		Silver	7440-22-4	1.67	I
Aliphatic anhydride	Trade secret	Die Attach	0.114	0.008	1,140			Total	100.00	
2-Butoxyethyl acetate	112-07-2	Die Attach	0.057	0.004	570	0.15	(mg) Total	Die Attach	% of Total Weight	2.28
Polymeric material	Trade secret	Die Attach	0.057	0.004 0.142	570 21,200		Ag	7440-22-4	75.00	
Silicon	1303-00-0	Chip (Die) Wire Bond	2.120 0.540	0.142	5,400		Epoxy resin Aliphatic anhydride	Trade secret Trade secret	15.00 5.00	
Doped Gold Tin	7440-57-5 7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1,380	0.036	13.800		2-Butoxvethyl acetate	112-07-2	2.50	
1111	7440-31-5 Plating (TOTALS:		6.700	1,000,000		Polymeric material	Trade secret	3	
	0.0067 g Tot		100.000	0.700	1,000,000		Folyment material	Total	100.00	1
	comply with EU Directive 2002/95/E		S Recast Dire	ective) and wi	th EU	0.14	(mg) Total	Chip (Die)	% of Total Weight	2.12
is semiconductor device and its homogenous materials of ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the cl	via internal design controls, suppli	C (RoHS Directive), EU Directive 2011/65/EU (RoH		·	-	0.14	(mg) Total GaAs	Chip (Die) 1303-00-0 Total	% of Total Weight 100 100.00	2.12
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the cl orporated's knowledge and belief as of the date of this d , is not below the threshold of regulatory concern for an	via internal design controls, supplinemical substance is NOT an intensocument, there is no credible rease y regulatory scheme world-wide.	C (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen	, to the best o	of Microchip To chemical sul	echnology	0.14	-	1303-00-0	100	2.12
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this d r, is not below the threshold of regulatory concern for an eding compounds used by Microchip meet the UL94 V0 file.	via internal design controls, supplinemical substance is NOT an interiocument, there is no credible reasily regulatory scheme world-wide.	C (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen	, to the best o	of Microchip To chemical sul	echnology	0.14	-	1303-00-0	100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified	via internal design controls, supplinemical substance is NOT an interiocument, there is no credible rease y regulatory scheme world-wide. ammability standard for plastics. Yellostics/	IC (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concent or can access the UL iQTM family of databases to	, to the best o ntration of the o obtain a tes	of Microchip T chemical sul t report at	echnology ostance, if		GaAs	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.54
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified i chemical substance is absent from the list above, the cl orporated's knowledge and belief as of the date of this d y, is not below the threshold of regulatory concern for an Iding compounds used by Microchip meet the UL94 V0 fi p://ul.com/global/eng/pages/offerings/industries/chemica e protective "tubes" in which the specific product is ship	via internal design controls, supplinemical substance is NOT an interiocument, there is no credible reasily regulatory scheme world-wide. It is ammability standard for plastics. It is/plastics/ uped are made from polyvinyl chlor in this form concerning substance best of its knowledge and belief, are it has been compiled based on the rade secrets and some information sight of these parts and the average.	IC (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen /ou can access the UL iQTM family of databases to ide (PVC) plastic. "Window envelopes" used to ho tes restricted by RoHS in Microchip Technology In s of the date listed in this form. Microchip Technol ier ranges provided in Material Safety Data Sheets in may not have been provided by subcontract asse e weight of anticipated significant toxic metals con	to the best on tration of the oobtain a test old the packin accorporated's logy incorpor provided by remblers and remblers	of Microchip To chemical sulfur teport at g slip on the semiconductated cannot g aw material s aw material s aw material s	echnology ostance, if outer box or devices juarantee uppliers.		GaAs (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	0.54
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the cl orporated's knowledge and belief as of the date of this d y, is not below the threshold of regulatory concern for an Idling compounds used by Microchip meet the UL94 V0 fi p://ul.com/global/eng/pages/offerings/industries/chemica e protective "tubes" in which the specific product is ship d certain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informatio their original packing materials is true and correct to the completeness and accuracy of data in this form becaus polier information is often protected from disclosure as to ormation is provided only as estimates of the average we	via internal design controls, supplinemical substance is NOT an interiocument, there is no credible reasily regulatory scheme world-wide. It is a substance of the substance of	IC (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. Itional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concent of ou can access the UL iQTM family of databases to ide (PVC) plastic. "Window envelopes" used to hose restricted by RoHS in Microchip Technology In sof the date listed in this form. Microchip Technol is ranges provided in Material Safety Data Sheets in may not have been provided by subcontract asses weight of anticipated significant toxic metals contest (silicon IC) in the finished parts.	to the best of the ook of the packing of the packin	of Microchip To chemical sult report at g slip on the semiconduct ated cannot g aw material s raw material s ese estimate:	echnology ostance, if outer box or devices juarantee uppliers. sign on outer box or devices product		GaAs (mg) Total	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.54
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this d is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 fl is://ul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information ineir original packing materials is true and correct to the completeness and accuracy of data in this form becaus piller information is often protected from disclosure as the runation is provided only as estimates of the average we ude trace levels of dopants, metals, and non-metal mater rochip Technology Incorporated does not provide any we ranties provided by Microchip Technology Incorporated	via internal design controls, supplinemical substance is NOT an interiocument, there is no credible reasily regulatory scheme world-wide. I ammability standard for plastics. Yels/plastics/ sped are made from polyvinyl chlor in in this form concerning substance best of its knowledge and belief, ase it has been compiled based on the rade secrets and some information eight of these parts and the averaginals contained within silicon devictor arranty, express or implied, with reand its subsidiaries are contained invoices.	IC (RoHS Directive), EU Directive 2011/65/EU (RoH ier declarations, and /or analytical test data. Itional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concent of u can access the UL iQTM family of databases to ide (PVC) plastic. "Window envelopes" used to hose restricted by RoHS in Microchip Technology In so of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets In may not have been provided by subcontract asse weight of anticipated significant toxic metals conces (silicon IC) in the finished portical in Microchip's standard terms and conditions of stations and shall not be liable for any damages, directions and shall not be liable for any damages.	to the best of the obstaint a test of the packing accorporated's logy incorpor provided by remblers and remponents. The exclusiale. These arrect or indirectors are the contract of the second of the contract of the second of th	of Microchip To chemical sult report at g slip on the semiconduct ated cannot g aw material shaw mat	echnology ostance, if outer box or devices puarantee uppliers, suppliers, so do not product	0.04	GaAs (mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.54

QU6E 06-UQFN 11:03 AM: 8/29/2013

Міспоснір				nation Base pper Alloy (0				ogeneous Materials: .g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	e Type: QUBE 12 (Lead)	UQFN 2x2x0.55mm (QM)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	1.74	(mg) Total	Mold Compound	% ot Total Weight	34.08
Silica, fused	60676-86-0	Mold Compound	30.672	1.564	306,720		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	1.653	0.084	16,529	Epox	y Resin (NLP # 500-033-5)	Trade Secret	4.85	1
Phenolic Resin	Trade Secret	Mold Compound	1.653	0.084	16,529		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.102	0.005	1,022		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	43.363	2.212	433,632			Total	100.00	
Nickel	7440-02-0	Lead Frame	1.156	0.059	11,565	2.32	(mg) Total	Lead Frame	% of Total Weight	45.53
Silicon	7440-21-3	Lead Frame	0.205	0.010	2,049		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.046	0.002	455		Nickel	7440-02-0	2.54]
Silver	7440-22-4	Lead Frame	0.760	0.039	7,599		Silicon	7440-21-3	0.45	
Silver	7440-22-4	Die Attach	2.256	0.115	22,560		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade secret	Die Attach	0.564	0.029	5,640		Silver	7440-22-4	1.67	
GaAs	1303-00-0	Chip (Die)	14.370	0.733	143,700			Total	100.00	Ī
Doped Gold	7440-57-5	Wire Bond	1.060	0.054	10,600	0.14	(mg) Total	Die Attach	% of Total Weight	2.82
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1	hour 2,140	0.109	21,400		Silver	7440-22-4	80.00	
		TOTA	ALS: 100.000	5.100	1,000,000		Epoxy Resin	Trade secret	20.00	1
	0.0051 g To omply with EU Directive 2002/95/E	tal Mass		ctive) and wi	th EU	0.73	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this decorporated.	omply with EU Directive 2002/95/E via internal design controls, suppl emical substance is NOT an inten ocument, there is no credible reas	tal Mass EC (RoHS Directive), EU Directive 2011/65/EU (ier declarations, and /or analytical test data. ttional ingredient in the semiconductor device	RoHS Recast Dire	f Microchip T	echnology	0.73	(mg) Total GaAs			14.37
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this dely, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flied.	omply with EU Directive 2002/95/E via internal design controls, suppl emical substance is NOT an inten ocument, there is no credible reas y regulatory scheme world-wide. ammability standard for plastics.	tal Mass EC (RoHS Directive), EU Directive 2011/65/EU (lier declarations, and /or analytical test data. Itional ingredient in the semiconductor device on to believe that the unavoidable impurity co	RoHS Recast Dire	f Microchip T chemical sub	echnology	0.73		Chip (Die) 1303-00-0	% of Total Weight	14.37
nis semiconductor device and its homogenous materials of rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the choorporated's knowledge and belief as of the date of this dory, is not below the threshold of regulatory concern for an olding compounds used by Microchip meet the UL94 V0 flitp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic.	omply with EU Directive 2002/95/k via internal design controls, supplemical substance is NOT an inten ocument, there is no credible reas y regulatory scheme world-wide. ammability standard for plastics. \(\) (s/plastics/	tal Mass EC (RoHS Directive), EU Directive 2011/65/EU (iler declarations, and /or analytical test data. tional ingredient in the semiconductor device on to believe that the unavoidable impurity co You can access the UL iQTM family of databas	RoHS Recast Dire	f Microchip T chemical sub t report at	echnology ostance, if		GaAs	Chip (Die) 1303-00-0 Total	% of Total Weight	: 14.37
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this do tay, is not below the threshold of regulatory concern for any colding compounds used by Microchip meet the UL94 V0 fltp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship.	omply with EU Directive 2002/95/E via internal design controls, supplemical substance is NOT an inten- ocument, there is no credible reas y regulatory scheme world-wide. ammability standard for plastics. is/plastics/ ped are made from polyvinyl chlor in this form concerning substant best of its knowledge and belief, a it has been compiled based on the rade secrets and some information ight of these parts and the average	tal Mass EC (RoHS Directive), EU Directive 2011/65/EU (iler declarations, and /or analytical test data. Itional ingredient in the semiconductor device on to believe that the unavoidable impurity co You can access the UL iQTM family of database ide (PVC) plastic. "Window envelopes" used to be restricted by RoHS in Microchip Technologis of the date listed in this form.	and, to the best of ncentration of the ses to obtain a test to hold the packing gy Incorporated's chnology Incorpora ests provided by ra- assemblers and ra-	f Microchip T chemical sub t report at g slip on the of semiconduct ated cannot g aw material s aw material s	echnology ostance, if outer box or devices juarantee juapliers. uppliers.		GaAs (mg) Total	Chip (Die) 1303-00-0 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	14.37
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this day, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flt tp://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship and certain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information their original packing materials is true and correct to the le completeness and accuracy of data in this form because upplier information is often protected from disclosure as tromation is provided only as estimates of the average we	omply with EU Directive 2002/95/E via internal design controls, supplemical substance is NOT an international members of the comment, there is no credible reas y regulatory scheme world-wide. ammability standard for plastics. 's/plastics/ ped are made from polyvinyl chloration in this form concerning substance it has been compiled based on the descrets and some information ignition these parts and the averagistics contained within silicon device arranty, express or implied, with rand its subsidiaries are contained.	tal Mass EC (RoHS Directive), EU Directive 2011/65/EU (lier declarations, and /or analytical test data. Itional ingredient in the semiconductor device on to believe that the unavoidable impurity co You can access the UL iQTM family of database (lide (PVC) plastic. "Window envelopes" used to the case restricted by RoHS in Microchip Technologis of the date listed in this form.	and, to the best of neentration of the ses to obtain a test to hold the packing gy Incorporated's chology Incorporated by rassemblers and rassemblers. The laration. The excludance of the packing of the	f Microchip T chemical subtreport at g slip on the commonduct ated cannot gaw material s aw material s ese estimates	echnology ostance, if outer box or devices uarantee uppliers. uppliers. s do not		GaAs (mg) Total	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	14.37
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this depty, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flip://ul.com/global/eng/pages/offerings/industries/chemical ne protective "tubes" in which the specific product is ship and certain "reels" may be made from PVC plastic. Incrochip Technology Incorporated believes the information their original packing materials is true and correct to the le completeness and accuracy of data in this form because upplier information is often protected from disclosure as the formation is provided only as estimates of the average we clude trace levels of dopants, metals, and non-metal mate icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	omply with EU Directive 2002/95/E via internal design controls, supplemical substance is NOT an intenocument, there is no credible reas y regulatory scheme world-wide. ammability standard for plastics. 's/plastics/ ped are made from polyvinyl chloral in this form concerning substances to fits knowledge and belief, a et has been compiled based on the ade secrets and some informationight of these parts and the averagerials contained within silicon device arranty, express or implied, with rand its subsidiaries are contained invoices. Schanges to Material Content Declate users' reliance on the informationed.	tal Mass C (RoHS Directive), EU Directive 2011/65/EU (lier declarations, and /or analytical test data. Itional ingredient in the semiconductor device on to believe that the unavoidable impurity co You can access the UL iQTM family of databas ride (PVC) plastic. "Window envelopes" used to sees restricted by RoHS in Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this form. Microchip Technologies of the date listed in this decidence of the information provided in this deci	and, to the best of neentration of the ses to obtain a test to hold the packing gy incorporated's chinology incorporated by reassemblers and rescomponents. The laration. The exclusion of sale. These areas, direct or indirect	f Microchip T chemical subtreport at g slip on the desemiconduct ated cannot g aw material s aw material s ese estimates usive, limited e provided in t, consequen	echnology stance, if outer box or devices puarantee uppliers. uppliers. s do not product	0.05	GaAs (mg) Total Doped Gold	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	14.37

5.100 100.000

QUBE 12 X2QFN 11:04 AM : 8/29/2013

Semiconductor Device	։Type: QUCE 16 ռ	.ead) UQFN/XDFN 3x3x0.45mm (QR)		ation Base a				nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			10.61	(mg) Total	Mold Compound	% ot Total Weight	51.99
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm			· ·		
Silica, fused Epoxy Resin	60676-86-0	Mold Compound	46.791	9.545	467,910		Silica, fused	60676-86-0	90.00	
Phenolic Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	2.522 2.522	0.514 0.514	25,215 25,215		Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	4.85 4.85	
Carbon Black	1333-86-4	Mold Compound	0.156	0.032	1.560		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	39.630	8.084	396,298		Calbuil Black	Total	100.00	
Nickel	7440-50-6	Lead Frame	1.057	0.216	10,569	0.40	() -			44.04
			0.187	0.216		8.49	(mg) Total	Lead Frame	% of Total Weight	41.61
Silicon	7440-21-3	Lead Frame			1,872		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.042	0.008	416		Nickel	7440-02-0	2.54	
Silver	7440-22-4 7440-22-4	Lead Frame	0.694	0.142	6,945		Silicon	7440-21-3	0.45	
Silver		Die Attach Die Attach	0.632 0.158	0.129 0.032	6,320		Magnesium	7439-95-4 7440-22-4	0.10	
Epoxy Resin	Trade secret				1,580		Silver		1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	2.170	0.443	21,700			Total	100.00	
Doped Gold	7440-57-5	Wire Bond	0.490	0.100	4,900	0.16	(mg) Total	Die Attach	% of Total Weight	0.79
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.950	0.602	29,500		Silver	7440-22-4	80.00	
		TOTALS:	100.000	20.400	1,000,000		Epoxy Resin	Trade secret	20.00	
	0.0204	g Total Mass						Total	100.00	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data.	S Recast Dire	ctive) and wi	th EU	0.44	(mg) Total Gallium arsenide	Chip (Die) 1303-00-0	% of Total Weight	2.17
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified when the list above, the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance is absent from the list above.	ria internal design controls emical substance is NOT a	,	to the best o	f Microchip T	echnology	0.44		1 '' '		2.17
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified we hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world mmability standard for pla	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concen	to the best o	f Microchip T chemical sul	echnology	0.44		1303-00-0	100	0.49
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified we hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 VO fla /ul.com/global/eng/pages/offerings/industries/chemical	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for pla s/plastics/	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concen-wide.	to the best ontration of the	f Microchip T chemical sul t report at	echnology bstance, if		Gallium arsenide	1303-00-0 Total	100	
citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified whemical substance is absent from the list above, the cheorated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat/ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Technology Incorporated believes the information pir original packing materials is true and correct to the tompleteness and accuracy of data in this form because liler information is often protected from disclosure as tr	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for plas/plastics/ sed are made from polyvin in this form concerning sets of its knowledge and it has been compiled basiade secrets and some infoght of these parts and the	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. astics. You can access the UL iQTM family of databases to apply chloride (PVC) plastic. "Window envelopes" used to how the control of the c	to the best on tration of the obtain a test of the packing accorporated's logy incorporated by reminders and remin	f Microchip T chemical sul t report at g slip on the semiconduct ated cannot g aw material s aw material s	cechnology bstance, if outer box tor devices guarantee suppliers. suppliers.		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
chive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Dilance with the above EU Directives has been verified with the above EU Directives of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat/ful.com/global/eng/pages/offerings/industries/chemicals/orotective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. The provided in the above EU Direction of the bompleteness and accuracy of data in this form because liter information is often protected from disclosure as transition is provided only as estimates of the average welde trace levels of dopants, metals, and non-metal mater opposition.	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for plas/plastics/ sed are made from polyvin in this form concerning set of its knowledge and I it has been compiled base ade secrets and some infoght of these parts and the ials contained within silicourranty, express or implied and its subsidiaries are co	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. astics. You can access the UL iQTM family of databases to apply chloride (PVC) plastic. "Window envelopes" used to how the control of the c	to the best of the contraction o	f Microchip T chemical sult t report at g slip on the semiconduct ated cannot g aw material s aw material s ese estimate:	outer box tor devices guarantee suppliers. s do not product		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
chive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Dilance with the above EU Directives has been verified with the above EU Directive of this do is not below the threshold of regulatory concern for any sing compounds used by Microchip meet the UL94 V0 flat (**ILCom/global/eng/pages/offerings/industries/chemicals-protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Only Technology Incorporated believes the information eir original packing materials is true and correct to the being provided only as estimates of the average well det trace levels of dopants, metals, and non-metal mater occhip Technology Incorporated does not provide any we anties provided by Microchip Technology Incorporated does not provide any we anties provided by Microchip Technology Incorporated is occhip's quotations, sales order acknowledgement, and is occhip disclaims any duty to notify users of updates or control of the average well and the account of the average well and the average well and the average well are the average well are the average well and the average well are the average well are the average well and the average well are the a	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for playlplastics/ ped are made from polyvin in this form concerning seest of its knowledge and I it has been compiled basiade secrets and some infight of these parts and the ials contained within silicouranty, express or implied and its subsidiaries are convoices.	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. astics. You can access the UL iQTM family of databases to apply chloride (PVC) plastic. "Window envelopes" used to how the control of the c	to the best of the	f Microchip T chemical sult t report at g slip on the semiconduct ated cannot g aw material s aw material s aw material s ese estimate:	outer box tor devices guarantee suppliers. suppliers. suppliers.		(mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100.00 % of Total Weight	
chive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Dilance with the above EU Directives has been verified whemical substance is absent from the list above, the cheporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat/ul.com/global/eng/pages/offerings/industries/chemicals/orotective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information bir original packing materials is true and correct to the being original packing materials is true and correct to the being region of the provided from disclosure as tration is provided only as estimates of the average well de trace levels of dopants, metals, and non-metal mater suchip Technology Incorporated does not provide any wanties provided by Microchip Technology Incorporated ioschip's quotations, sales order acknowledgement, and is obchip disclaims any duty to notify users of updates or civise, suffered by users or third parties as a result of the wise.	ria internal design controls emical substance is NOT a cument, there is no credit regulatory scheme world immability standard for playlplastics/ ped are made from polyvin in this form concerning seest of its knowledge and I it has been compiled basiade secrets and some infight of these parts and the ials contained within silicouranty, express or implied and its subsidiaries are convoices.	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concent-wide. astics. You can access the UL iQTM family of databases to astics. You can access the UL iQTM family of databases to a concentration of the databases to astics. You can access the UL iQTM family of databases to a concentration of the databases to astic astic and the concentration of the database to a concentration of the d	to the best of the	f Microchip T chemical sult t report at g slip on the semiconduct ated cannot g aw material s aw material s aw material s ese estimate:	outer box tor devices guarantee suppliers. suppliers. suppliers.	0.10	Gallium arsenide (mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.49

QUCE 16 UQFN_XDFN 11:04 AM : 8/29/2013

AICROCHIP				ination Base			•	nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	e Type: Q3DE 20 (L	ead) UQFN 3x3x0.55mm (QD)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	10.59	(mg) Total	Mold Compound	% ot Total Weight	51.57
Silica, fused	60676-86-0	Mold Compound	46.413	9.529	464,130		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.501	0.513	25,011		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.501	0.513	25,011		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.155	0.032	1,547		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	39.916	8.195	399,155			Total	100.00	ī
Nickel	7440-02-0	Lead Frame	1.065	0.219	10,645	8.60	(mg) Total	Lead Frame	% of Total Weight	41.91
Silver	7440-22-4	Lead Frame	0.699	0.144	6.995		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.189	0.039	1.886		Nickel	7440-02-0	2.54	1
Magnesium	7439-95-4	Lead Frame	0.042	0.009	419		Silver	7440-22-4	1.67	
Silver	7440-22-4	Die Attach	0.656	0.135	6.560		Silicon	7440-21-3	0.45	
Epoxy Resin	Trade secret	Die Attach	0.164	0.034	1,640		Magnesium	7439-95-4	0.43	
Silicon	7440-21-3	Chip (Die)	2.180	0.448	21.800		iviagriesium	Total	100.00	1
Doped Gold	7440-57-5	Wire Bond	0.530	0.109	5.300		(mg) Total			
					-,	0.17		Die Attach	% of Total Weight	0.82
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.990	0.614	29,900		Silver	7440-22-4	80.00	
		TOTALS:	100.000	20.530	1,000,000		Epoxy Resin	Trade secret	20.00	1
	0.02053	g Total Mass						Total	100.00	
e camicanductor device and ite hamagenous materials co					h EII					
is semiconductor device and its homogenous materials or ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).			S Recast Dire	ective) and wit	th EU	0.45	(mg) Total	Chip (Die)	% of Total Weight	2.18
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v	via internal design controls,	, supplier declarations, and /or analytical test data.		·		0.45	(mg) Total Doped Silicon	7440-21-3	% of Total Weight 100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	via internal design controls, emical substance is NOT a ocument, there is no credibl y regulatory scheme world-	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concendide.	to the best o	f Microchip To	echnology		Doped Silicon	7440-21-3 Total	100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified or chemical substance is absent from the list above, the ch orporated's knowledge and belief as of the date of this do r, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 fla p://ul.com/global/eng/pages/offerings/industries/chemical	via internal design controls, emical substance is NOT an ocument, there is no credibly y regulatory scheme world- ammability standard for plas s/plastics/	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concendide. Stics. You can access the UL iQTM family of databases to	to the best of tration of the obtain a tes	f Microchip To chemical sub t report at	echnology ostance, if	0.45	Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified or chemical substance is absent from the list above, the ch orporated's knowledge and belief as of the date of this do y, is not below the threshold of regulatory concern for any	via internal design controls, emical substance is NOT an ocument, there is no credibly y regulatory scheme world- ammability standard for plas s/plastics/	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concendide. Stics. You can access the UL iQTM family of databases to	to the best of tration of the obtain a tes	f Microchip To chemical sub t report at	echnology ostance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	: 0.53
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified or chemical substance is absent from the list above, the ch orporated's knowledge and belief as of the date of this do y, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 fla p://ul.com/global/eng/pages/offerings/industries/chemical e protective "tubes" in which the specific product is shipp	via internal design controls, emical substance is NOT an ocument, there is no credibly y regulatory scheme world- ammability standard for plat s/plastics/ ped are made from polyviny in this form concerning su st of its knowledge and belic las been compiled based or ets and some information narts and the average weight	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent wide. It is stice. You can access the UL iQTM family of databases to the concentration of the concentration o	to the best of tration of the obtain a tes obtain a tes of the packin corporated's y incorporated ided by raw and raw mater	of Microchip To chemical sub- t report at g slip on the c semiconducted cannot gua material supplirial suppliers.	echnology istance, if outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	: 0.53
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified or chemical substance is absent from the list above, the ch orporated's knowledge and belief as of the date of this do y, is not below the threshold of regulatory concern for any Iding compounds used by Microchip meet the UL94 V0 fla p://ul.com/global/eng/pages/offerings/industries/chemical e protective "tubes" in which the specific product is shipp tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information iir original packing materials is true and correct to the bes mpleteness and accuracy of data in this form because it hormation is often protected from disclosure as trade secrevided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these	wia internal design controls, emical substance is NOT an occument, there is no credibly regulatory scheme world-ammability standard for platis/plastics/ped are made from polyviny in in this form concerning sust of its knowledge and belie has been compiled based or ets and some information marts and the average weight in silicon devices (silicon IC arranty, express or implied, arranty, express or implied,	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent wide. Stics. You can access the UL IQTM family of databases to the concentration of the	to the best of tration of the or obtain a test of the packin corporated's y Incorporate ided by raw ind raw maters e estimates	of Microchip To chemical sub- t report at g slip on the co- semiconducted cannot gua material suppliers, do not include usive, limited	echnology stance, if outer box and or devices in rantee the liers. Supplier Information is e trace levels		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.53
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified to chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do y, is not below the threshold of regulatory concern for any Idding compounds used by Microchip meet the UL94 V0 fit p://ul.com/global/eng/pages/offerings/industries/chemical e protective "tubes" in which the specific product is shipp tain "reels" may be made from PVC plastic. prochip Technology Incorporated believes the information ir original packing materials is true and correct to the besomable in this form because it hormation is often protected from disclosure as trade secretived only as estimates of the average weight of these paradopants, metals, and non-metal materials contained within prochip Technology Incorporated does not provide any was provided by Microchip Technology Incorporated of the provided provided by Microchip Technology Incorporated provided only as estimates of the provided provided and within prochip Technology Incorporated provided provided and provided by Microchip Technology Incorporated provided only as estimated the provided provided provided by Microchip Technology Incorporated provided	wia internal design controls, emical substance is NOT an occument, there is no credibly regulatory scheme world-ammability standard for plat s/plastics/ ped are made from polyviny and in this form concerning sust of its knowledge and believed and seen compiled based or ets and some information marts and the average weight in silicon devices (silicon IC) arranty, express or implied, and its subsidiaries are conthanges to Material Content te users' reliance on the info	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentions wide. Stics. You can access the UL iQTM family of databases to the concentration of	to the best of tration of the o obtain a test of obtain a test of the packin corporated's y lncorporated y lncorporate ided by raw and raw maters es estimates on. The exclusion. The exclusion of the exclusion o	of Microchip To chemical sub- treport at g slip on the c semiconducte do cannot gua material suppli rial suppliers. do not include usive, limited in e provided in	echnology stance, if buter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's	0.11	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.53

Q3DE 20 UQFN 11:04 AM: 8/29/2013

MICROCHIP Semiconductor Device	Type: MV 28 (Log	4) LIOEN (v/v) 5mm (P6)		nation Base /				nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	11.99	(mg) Total	Mold Compound	% ot Total Weight	45.93
Silica, fused	60676-86-0	Mold Compound	41.337	10.789	413.370	1	Silica, fused	60676-86-0	90.00	1
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.228	0.581	22.276	Enox	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.228	0.581	22,276	Lpox	Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.138	0.036	1.378		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	34.095	8.899	340.953	Į.	Carbon Black	Total	100.00	4
Copper Tin	7440-30-8	Lead Frame	0.088	0.023	875	9.14	(mg) Total	Lead Frame	% of Total Weight	
						9.14				30
Silver Zinc	7440-22-4 7440-66-6	Lead Frame	0.667	0.174	6,668		Copper	7440-50-8	97.42	1
Chromium	7440-66-6	Lead Frame Lead Frame	0.063	0.016	630 875		Tin Silver	7440-31-5 7440-22-4	0.25 1.91	1
Silver	7440-47-3	Die Attach	1.123	0.023	11.232		Zinc	7440-22-4	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.259	0.293	2.592		Chromium	7440-66-6	0.18	
Treated silica	Trade Secret	Die Attach	0.259	0.008	2,592	L	Chromium	7440-47-3 Total	0.25	
Heterocyclic organic compound	Trade Secret	Die Attach	0.029	0.008	288	0.38	(mg) Total	Die Attach	% of Total Weight	1.44
Silicon	7440-21-3	Chip (Die)	8.700	2.271	87,000		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.510	0.133	5,100	r	Acrylate resins Proprietary	Trade Secret	18	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	8.420	2.198	84,200		Treated silica	Trade Secret	2	4
		TOTALS:	100.000	26.100	1,000,000	Hete	rocyclic organic compound	Trade Secret	2	1
his semiconductor device and its homogenous materials co		g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	tive) and with	EU Directive			Total	100.00	
This semiconductor device and its homogenous materials of 002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified to	omply with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	tive) and with	EU Directive	2.27	Total (mg) Doped Silicon	Total Chip (Die) 7440-21-3	% of Total Weight	
002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified wat a chemical substance is absent from the list above, the chancorporated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for any regulatory concern for any regulatory.	omply with EU Directive 2 via internal design control emical substance is NOT a boument, there is no credii ulatory scheme world-wid	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concene.	to the best of stration of the o	Microchip Tec	hnology	2.27	,	Chip (Die)	% of Total Weight	8.7
002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified was a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for any regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemical	omply with EU Directive 2 via internal design control emical substance is NOT a ccument, there is no credii ulatory scheme world-wid ammability standard for pl s/plastics/	DOZ/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concente. astics. You can access the UL iQTM family of databases to	to the best of stration of the o	Microchip Tec chemical subs report at	hnology tance, if any,	0.13	,	Chip (Die) 7440-21-3	% of Total Weight	8.7
002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified we are a chemical substance is absent from the list above, the chancorporated's knowledge and belief as of the date of this do	omply with EU Directive 2 via internal design control emical substance is NOT a ccument, there is no credii ulatory scheme world-wid ammability standard for pl s/plastics/	DOZ/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concente. astics. You can access the UL iQTM family of databases to	to the best of stration of the o	Microchip Tec chemical subs report at	hnology tance, if any,		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	0.51
002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified of a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this do s not below the threshold of regulatory concern for any regulatory concern for any regulatory concern for any regulatory concern for any regulatory compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is shipped to the contractive "tubes" in which the specific product is shipped to the contractive "tubes" in which the specific product is shipped to the contractive "tubes" in which the specific product is shipped to the contractive "tubes" in which the specific product is shipped to the contractive "tubes" in which the specific product is shipped to the contractive traction traction to the contractive traction tra	omply with EU Directive 2 via internal design control emical substance is NOT a courment, there is no credii ulatory scheme world-wid ammability standard for pl s/plastics/ ped are made from polyvir in in this form concerning a t of its knowledge and be as been compiled based o ets and some information arts and the average weigl	DOZ/PS/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concente. Justics. You can access the UL iQTM family of databases to any chloride (PVC) plastic. "Window envelopes" used to hose substances restricted by RoHS in Microchip Technology In the ranges provided in Material Safety Data Sheets prowing and the ranges provided in Material Safety Data Sheets prowing the range sprovided in	to the best of stration of the coordinates of the c	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial supplie	hnology tance, if any, iter box and r devices in ntee the rs. Supplier formation is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	0.51
002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified of a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any regulation of the complex of the date of this do is not below the threshold of regulatory concern for any regulatory in the complex of the complex of the complex of the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. flicrochip Technology Incorporated believes the information heir original packing materials is true and correct to the besompleteness and accuracy of data in this form because it h nformation is often protected from disclosure as trade secretorided only as estimates of the average weight of these per original packing materials is the secretorided only as estimates of the average weight of these per original packing materials is the secretorided only as estimates of the average weight of these per original packing materials is the secretorided only as estimates of the average weight of these per original packing materials is the secretorided only as estimates of the average weight of these per original packing materials is the secretorided only as estimates of the average weight of these per original packing materials is the secretorial original packing materials is the secret	omply with EU Directive 2 via internal design control emical substance is NOT a coument, there is no credit ulatory scheme world-wid ammability standard for pi s/plastics/ ped are made from polyvir in in this form concerning a ti of its knowledge and be as been compiled based o ets and some information arts and the average weigi in silicon devices (silicon I arranty, express or implier	DOZ/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concent. astics. You can access the UL iQTM family of databases to a concentration of the concen	to the best of tration of the operation	Microchip Tec chemical subs report at slip on the ou semiconducto I cannot guara aterial suppliers. Ir o not include	hnology tance, if any, eter box and r devices in intee the rs. Supplier iformation is crace levels		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	0.51
002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified of a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any regulatory configuration of the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the besompleteness and accuracy of data in this form because it homormation is often protected from disclosure as trade secretory ded only as estimates of the average weight of these performance in the product of the average secretory of the average secretory of the average secretory of the product of the average secretory of the product of the average secretory of the product of the average secretory of the average secretory of the product of the average secretory	omply with EU Directive 2 via internal design control emical substance is NOT a coument, there is no credii ulatory scheme world-wid ammability standard for pi s/plastics/ ped are made from polyvir a in this form concerning a at of its knowledge and be as been compiled based o ets and some information arts and the average weigl n silicon devices (silicon I arranty, express or implied and its subsidiaries are co-	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerned. lastics. You can access the UL iQTM family of databases to any chloride (PVC) plastic. "Window envelopes" used to hose substances restricted by RoHS in Microchip Technology In tief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets prowided in Material Safety Data Sheets prowing the ranges provided in Material Safety Data Sheets prowing the range provided in Material Safety Data Sheets prowing the range provided in Material Safety Data Sheets prowing the range provided in Material Safety Data Sheets prowing the finished parts. d., with respect to the information provided in this declaration tained in Microchip's standard terms and conditions of set the Declarations and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages.	to the best of stration of the coordinates. On obtain a test and the packing accorporated's sylncorporated ded by raw mandraw materiase estimates do ion. The exclusiale. These are sect or indirect,	Microchip Tec chemical subs report at slip on the ou- semiconductor I cannot guara aterial supplies. In o not include of sive, limited pi provided in M	hnology tance, if any, atter box and or devices in intee the rs. Supplier formation is trace levels oduct icrochip's	0.13	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin /	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.51

ЛІСЯОСНІР				nination Base copper Alloy	,			ogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor De	vice Type: MV 28 uQFN	l 6x6x0.5mm (MQ)								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	1.24	(mg) Total	Mold Compound	% ot Total Weight	42.75
Silica, fused	60676-86-0	Mold Compound	38.475	1.120	384,750		Silica, fused	60676-86-0	90.00	
Epoxy Resin	500-033-5	Mold Compound	2.073	0.060	20,734		Epoxy Resin	500-033-5	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.073	0.060	20,734		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.128	0.004	1,283		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	42.249	1.229	422,489		·-	Total	100.00	=
Tin	7440-31-5	Lead Frame	0.108	0.003	1,084	1.26	(mg) Total	Lead Frame	% of Total Weight	43.37
Silver	7440-22-4	Lead Frame	0.826	0.024	8,262		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.078	0.002	781		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.108	0.003	1,084		Silver	7440-22-4	1.91	
Silica, vitreous	60676-86-0	Die Attach	0.483	0.014	4,830		Zinc	7440-66-6	0.18	
Solid Epoxy Resin	Trade Secret	Die Attach	0.897	0.026	8,970		Chromium	7440-47-3	0.25	
Silicon	7440-21-3	Chip (Die)	8.950	0.260	89,500			Total	100.00	
Gold	7440-57-5	Wire Bond	1.380	0.040	13,800	0.04	(mg) Total	Die Attach	% of Total Weight	1.38
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.170	0.063	21,700		Silica, vitreous	60676-86-0	35.00	
		TOTALS:	100.000	2.910	1,000,000		Solid Epoxy Resin	Trade Secret	65.00	
		g Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS		ective) and wit	h EU Directive	0.26	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	8.95
2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verif	als comply with EU Directive 20	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data.	S Recast Dire	,	,	0.26	(mg) Total Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	8.95
//53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verif themical substance is absent from the list above, the prorated's knowledge and belief as of the date of the	als comply with EU Directive 20 fied via internal design controls e chemical substance is NOT a is document, there is no credib	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs s, supplier declarations, and /or analytical test data. in intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	S Recast Dire	f Microchip Te	echnology	0.26		Chip (Die)	% of Total Weight	8.95
2/53/EC (End-of-Life Vehicles (ELV) Directive). npliance with the above EU Directives has been verif chemical substance is absent from the list above, th orporated's knowledge and belief as of the date of th ot below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V	als comply with EU Directive 20 iied via internal design controls e chemical substance is NOT a is document, there is no credib regulatory scheme world-wide /0 flammability standard for pla	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs s, supplier declarations, and /or analytical test data. in intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	S Recast Directors to the best of the best	f Microchip Te	echnology	0.26		Chip (Die) 7440-21-3	% of Total Weight	1.38
/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verifulation and the list above, the prorated's knowledge and belief as of the date of the the blow the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 \(\frac{1}{1/10}\) (Jul.com/global/eng/pages/offerings/industries/chem protective "tubes" in which the specific product is set.	als comply with EU Directive 20 ied via internal design controls e chemical substance is NOT a is document, there is no credib regulatory scheme world-wide /0 flammability standard for pla nicals/plastics/	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concent.	S Recast Director to the best of tration of the obtain a test	f Microchip Te chemical sub t report at	echnology ostance, if any,		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
2/53/EC (End-of-Life Vehicles (ELV) Directive). npliance with the above EU Directives has been verif chemical substance is absent from the list above, th proporated's knowledge and belief as of the date of th ot below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 proful.com/global/eng/pages/offerings/industries/chem protective "tubes" in which the specific product is a tain "reels" may be made from PVC plastic. prochip Technology Incorporated believes the information is protected from a correct to the pleteness and accuracy of data in this form because rmation is often protected from disclosure as trades.	als comply with EU Directive 20 ied via internal design controls e chemical substance is NOT a is document, there is no credib regulatory scheme world-wide //0 flammability standard for pla nicals/plastics/ shipped are made from polyving ation in this form concerning st e best of its knowledge and beli e it has been compiled based o secrets and some information r se parts and the average weigh	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. To the concents of the concen	to the best of tration of the obtain a test of the packing corporated's y incorporate fided by raw indiraw mater	f Microchip Te chemical sub t report at g slip on the o semiconducto d cannot gual material suppliers.	echnology stance, if any, buter box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verif chemical substance is absent from the list above, th orporated's knowledge and belief as of the date of the ot below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 \(\frac{1}{2}\). 2/1/ul.com/global/eng/pages/offerings/industries/chen is protective "tubes" in which the specific product is a iain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the informary or original packing materials is true and correct to the pleteness and accuracy of data in this form because wided only as estimates of the average weight of the lopants, metals, and non-metal materials contained verochip Technology Incorporated does not provide an orochip Technology Incorporated Incorporat	als comply with EU Directive 20 iled via internal design controls e chemical substance is NOT a is document, there is no credib regulatory scheme world-wide /0 flammability standard for pla nicals/plastics/ shipped are made from polyving ation in this form concerning su best of its knowledge and beli e it has been compiled based o secrets and some information r se parts and the average weigh within silicon devices (silicon IC	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. To the concents of the concen	to the best of tration of the obtain a test obtain a test of the packing corporated's y Incorporate ided by raw ind raw mater se estimates	of Microchip To chemical sub t report at g slip on the o semiconductored cannot gual material suppliers. do not include usive, limited p	echnology stance, if any, buter box and or devices in rantee the liers. Supplier Information is trace levels		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verif chemical substance is absent from the list above, the orporated's knowledge and belief as of the date of the tot below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 Vo. compounds in which the specific product is a tain "reels" may be made from PVC plastic. Torchip Technology Incorporated believes the informate or original packing materials is true and correct to the pleteness and accuracy of data in this form because tradiction is often protected from disclosure as trade is vided only as estimates of the average weight of the tolopants, metals, and non-metal materials contained verochip Technology Incorporated does not provide an ranties provided by Microchip Technology Incorporatations, sales order acknowledgement, and invoices rochip disclaims any duty to notify users of updates	als comply with EU Directive 20 fied via internal design controls e chemical substance is NOT a is document, there is no credib regulatory scheme world-wide (0 flammability standard for pla- nicals/plastics/ shipped are made from polyving ation in this form concerning standard some information is best of its knowledge and belia is that been compiled based secrets and some information is see parts and the average weigh within silicon devices (silicon IC to warranty, express or implied ted and its subsidiaries are con- or changes to Material Content of the users' reliance on the int	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), spepplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concents. In intentional ingredient in the unavoidable impurity concents in the concents of the data access the UL iQTM family of databases to be updated in the concents of the databases to the concents of the data listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers at at of anticipated significant toxic metals components. These in the finished parts.	to the best of tration of the obtain a test of the packing corporated's y Incorporated ided by raw indiraw maters estimates on. The exclusion. These are ect or indirect	If Microchip Te chemical subtreport at g slip on the of semiconducts and cannot guaranterial suppliers. do not include usive, limited pe provided in tt, consequent	achnology stance, if any, outer box and or devices in rantee the ilers. Supplier Information is e trace levels product Microchip's	0.04	Doped Silicon (mg) Total Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	1.38

MV 11:04 AM : 8/29/2013

MICROCHIP		11071		ation Base / per Alloy (C	,			geneous Materials: g. pc boards, display:	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device 1	ype: MV 40 (Lead	, ,								3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	18.45	(mg) Total	Mold Compound	% ot Total Weight	43.41
Silica, fused	60676-86-0	Mold Compound	39.069	16.604	390.690		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.105	0.895	21,054	Ероху	Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.105	0.895	21,054		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.130	0.055	1,302		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	41.966	17.836	419,664	•		Total	100.00	
Tin	7440-31-5	Lead Frame	0.108	0.046	1,077	18.31	(mg) Total	Lead Frame	% of Total Weight	43.08
Silver	7440-22-4	Lead Frame	0.821	0.349	8,207		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.078	0.033	775		Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.108	0.046	1,077		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.240	0.527	12,402		Zinc	7440-66-6	0.18	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.286	0.122	2,862		Chromium	7440-47-3	0.25	
Treated silica	Trade Secret	Die Attach	0.032	0.014	318			Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.032	0.014	318	0.68	(mg) Total	Die Attach	% of Total Weight	1.59
Silicon	7440-21-3	Chip (Die)	6.650	2.826	66,500		Silver	7440-22-4	78	
Gold Tin	7440-57-5 7440-31-5	Wire Bond	1.540	0.655	15,400	F	Acrylate resins Proprietary	Trade Secret	18	
IIN	/440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.730	1.585	37,300		Treated silica	Trade Secret	2	
****			100 000	42 E00	1 000 000	L La La sa	constitue and a few and a second	Trada Cassat	2	
		TOTALS:	100.000	42.500	1,000,000	Hetero	ocyclic organic compound	Trade Secret	2	
UTL / Material compilation	0.0425	g Total Mass			,,	Hetero	ocyclic organic compound	Trade Secret Total	_	
UTL / Material compilation	0.0425	g Total Mass			,,	2.83	Total (mg)		_	6.65
UTL / Material compilation	0.0425 ials comply with EU Dire V) Directive).	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011	/65/EU (RoHS		,,	'		Total	100.00	6.65
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL'	0.0425 ials comply with EU Dir V) Directive). ified via internal design he chemical substance the date of this docume	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una	/65/EU (RoHS t data. r device and, to	Recast Directors	tive) and	'	Total (mg)	Total Chip (Die)	100.00 % of Total Weight	6.65
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL' compliance with the above EU Directives has been ver a chemical substance is absent from the list above, to echnology Incorporated's knowledge and belief as of	0.0425 ials comply with EU Dir V) Directive). ified via internal design he chemical substance the date of this docume old of regulatory conce	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una rn for any regulatory scheme world-wide.	/65/EU (RoHS) t data. r device and, to voidable impu	Recast Directory of the best of the best of the price on the price of	tive) and Microchip	'	Total (mg)	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	6.65
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL' compliance with the above EU Directives has been via a chemical substance is absent from the list above, the chonology Incorporated's knowledge and belief as of the chemical substance, if any, is not below the thresh folding compounds used by Microchip meet the UL94	0.0425 ials comply with EU Dir V) Directive). ified via internal design he chemical substance the date of this docume old of regulatory conce V0 flammability standa micals/plastics/ shipped are made from	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una rn for any regulatory scheme world-wide. rd for plastics. You can access the UL iQTM family of	/65/EU (RoHS t data. r device and, to voidable imput databases to dat	Recast Directory of the best of the concentrity concentrity concentrity contain a test	Microchip ration of	2.83	Total (mg) Doped Silicon	Total Chip (Die) 7440-21-3 Total	100.00 % of Total Weight 100 100.00	
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL' compliance with the above EU Directives has been ver a chemical substance is absent from the list above, the chology Incorporated's knowledge and belief as of the chemical substance, if any, is not below the thresh folding compounds used by Microchip meet the UL94 ttp://ul.com/global/eng/pages/offerings/industries/che the protective "tubes" in which the specific product is	0.0425 ials comply with EU Dir V) Directive). ified via internal design he chemical substance the date of this docume old of regulatory conce V0 flammability standa emicals/plastics/ shipped are made from IC plastic. nation in this form conc als is true and correct to eteness and accuracy of Supplier information is terial suppliers. Informa	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una rn for any regulatory scheme world-wide. rd for plastics. You can access the UL iQTM family of n polyvinyl chloride (PVC) plastic. "Window envelopes erning substances restricted by RoHS in Microchip T to the best of its knowledge and belief, as of the date I data in this form because it has been compiled base often protected from disclosure as trade secrets and tion is provided only as estimates of the average wei-	/65/EU (RoHS t data. r device and, t voidable impu databases to " used to hold echnology Inc isted in this fod on the range some informaght of these page of the second in the second in the range of the second informaght of these page of the page o	o the best of the packing orporated's orm. Microches provided i the packing orporated attorn may no arts and the servers are t	Microchip ration of report at g slip on ip n Material t have average	2.83	Total (mg) Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL' compliance with the above EU Directives has been ver a chemical substance is absent from the list above, technology Incorporated's knowledge and belief as of the chemical substance, if any, is not below the thresh folding compounds used by Microchip meet the UL94 ttp://ul.com/global/eng/pages/ofterings/industries/che the protective "tubes" in which the specific product is the outer box and certain "reels" may be made from PY flicrochip Technology Incorporated believes the inforn emiconductor devices in their original packing materi fechnology Incorporated cannot guarantee the completatety Data Sheets provided by raw material suppliers. Seen provided by subcontract assemblers and raw ma reight of anticipated significant toxic metal componalition devices (silicon IC) in the finished parts. flicrochip Technology Incorporated does not provide a mited product warranties provided by Microchip Tech these are provided in Microchip's quotations, sales or	0.0425 ials comply with EU Dir V) Directive). ified via internal design the chemical substance the date of this docume old of regulatory conceive V0 flammability standa micals/plastics/ shipped are made from CC plastic. nation in this form conce als is true and correct to eteness and accuracy of Supplier information is terial suppliers. Informa ents. These estimates de- any warranty, express o inology Incorporated ander acknowledgement,	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una rn for any regulatory scheme world-wide. rd for plastics. You can access the UL iQTM family of a polyvinyl chloride (PVC) plastic. "Window envelopes erning substances restricted by RoHS in Microchip T to the best of its knowledge and belief, as of the date I if data in this form because it has been compiled base to often protected from disclosure as trade secrets and tion is provided only as estimates of the average weig to not include trace levels of dopants, metals, and non r implied, with respect to the information provided in ind its subsidiaries are contained in Microchip's standard and invoices.	despective and the second of t	Recast Direct of the best of furity concent obtain a test of the packing orporated's furm. Microch sprovided i ation may no arts and the a ols contained on. The exclu conditions of	Microchip ration of report at g slip on ip n Material t have average I within	2.83	Total (mg) Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100	
UTL / Material compilation This semiconductor device and its homogenous mater with EU Directive 2002/53/EC (End-of-Life Vehicles (EL'compliance with the above EU Directives has been verent a chemical substance is absent from the list above, the echnology Incorporated's knowledge and belief as of the chemical substance, if any, is not below the thresh folding compounds used by Microchip meet the UL94 ttp://ul.com/global/eng/pages/offerings/industries/chep trective "tubes" in which the specific product is the outer box and certain "reels" may be made from Pledicrochip Technology Incorporated believes the informent onductor devices in their original packing materifiechnology Incorporated cannot guarantee the completatety Data Sheets provided by raw material suppliers. The provided by subcontract assemblers and raw materight of anticipated significant toxic metals compone illicon devices (silicon IC) in the finished parts. Ilicrochip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporated does not provide a mited product warranties provided by Microchip Technology Incorporat	0.0425 ials comply with EU Dir V) Directive). ified via internal design he chemical substance the date of this docume old of regulatory conce V0 flammability standa emicals/plastics/ s shipped are made from /C plastic. nation in this form conce als is true and correct to esteness and accuracy to constitute the concept of the concept sterial suppliers. Informa ents. These estimates do any warranty, express o inology Incorporated an der acknowledgement, is s or changes to Materia parties as a result of the	TOTALS: g Total Mass ective 2002/95/EC (RoHS Directive), EU Directive 2011 controls, supplier declarations, and /or analytical tes is NOT an intentional ingredient in the semiconducto ent, there is no credible reason to believe that the una rn for any regulatory scheme world-wide. rd for plastics. You can access the UL iQTM family of a polyvinyl chloride (PVC) plastic. "Window envelopes erning substances restricted by RoHS in Microchip T to the best of its knowledge and belief, as of the date I data in this form because it has been compiled base often protected from disclosure as trade secrets and tion is provided only as estimates of the average well on tinclude trace levels of dopants, metals, and non r implied, with respect to the information provided in dd its subsidiaries are contained in Microchip's standia and invoices. I Content Declarations and shall not be liable for any e users' reliance on the information in Material Conter	t data. r device and, to r device and, to r device and, to revoidable imput databases to the recent of the recent	o the best of irity concent obtain a test or indirect	Microchip ration of report at g slip on ip n Material t have average I within sive, f sale.	2.83	Total (mg) Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	1.54

MV 40 UQFN 11:05 AM : 8/29/2013

MICROCHIP				nation Base /	-		•	ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Dev	ice Type: QVCE 16 (Lead) VQFN 3x3x0.9mm (QV)								e3
		"Contained In"	% Total			10.00	() T .(.)		0/ -4 T -4 -1 1 1 4 -1 -1 4	50.7
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	12.83	(mg) Total	Mold Compound	% ot Total Weight	50.7
Silica, vitreous (or fused)	60676-86-0	Mold Compound	43.095	10.903	430,950		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.411	1.116	44,109		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	3.042	0.770	30,420		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.152	0.038	1,521		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	41.540	10.510	415,397			Total	100.00	-
Iron	7439-89-6	Lead Frame	1.022	0.259	10,218	11.00	(mg) Total	Lead Frame	% of Total Weight	43.48
Silver	7440-22-4	Lead Frame	0.828	0.210	8,283		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.054	0.014	544		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.036	0.009	359		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	1.360	0.344	13,600		Zinc	7440-66-6	0.13	
Epoxy Resin	Trade secret	Die Attach	0.340	0.086	3,400		Phosphorous	7723-14-0	0.08	
Doped GaAs	1300-00-00	Chip (Die)	1.340	0.339	13,400			Total	100.00	
Doped Gold	7440-57-5	Wire Bond	0.400	0.101	4,000	0.43	(mg) Total	Die Attach	% of Total Weight	1.7
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.380	0.602	23,800		Silver	7440-22-4	80.00	
		TOTALS:	100.000	25.300	1,000,000		Epoxy Resin	Trade secret	20.00	
	0.0253	g Total Mass						Total	100.00	•
his comisonductor device and its homogenous material	comply with ELL Directive 20	02/05/EC (PaUS Directive) ELL Directive 2011/65/ELL (PaU)	C Donact Dire	otivo) and wi	th EII					
This semiconductor device and its homogenous material Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive Compliance with the above EU Directives has been verified	9)	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data.	S Recast Dire	ective) and wi	th EU	0.34	(mg) Total Doped GaAs	Chip (Die) 1300-00-00	% of Total Weight	1.34
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verific in a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this iny, is not below the threshold of regulatory concern for	e) d via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world-	s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide.	to the best o tration of the	f Microchip T chemical sul	echnology	0.34		,	_	1.34
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive Compliance with the above EU Directives has been verific if a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this iny, is not below the threshold of regulatory concern for	e) ed via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world-	s, supplier declarations, and for analytical test data. In intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concen	to the best o tration of the	f Microchip T chemical sul	echnology	0.34		1300-00-00	100	0.4
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive Compliance with the above EU Directives has been verifie f a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this uny, is not below the threshold of regulatory concern for Molding compounds used by Microchip meet the UL94 Vottp://ul.com/global/eng/pages/offerings/industries/chemi	e) ed via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world- flammability standard for pla cals/plastics/	s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide.	to the best o tration of the	f Microchip T chemical sul t report at	echnology bstance, if		Doped GaAs	1300-00-00 Total	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive Compliance with the above EU Directives has been verific if a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this inny, is not below the threshold of regulatory concern for Molding compounds used by Microchip meet the UL94 V(ttp://ul.com/global/eng/pages/offerings/industries/chemisthe protective "tubes" in which the specific product is slund certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informat in their original packing materials is true and correct to the completeness and accuracy of data in this form beausupplier information is often protected from disclosure a supplier information is often protected from disclosure a	e) ed via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world- if flammability standard for pla cals/plastics/ sipped are made from polyving ion in this form concerning st the best of its knowledge and b use it has been compiled base to trade secrets and some info weight of these parts and the	s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. Istics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to holubstances restricted by RoHS in Microchip Technology Intelief, as of the date listed in this form. Microchip Technolod on the ranges provided in Material Safety Data Sheets; mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	to the best o tration of the o obtain a test d the packing corporated's ogy Incorpor- rovided by re- mblers and r	f Microchip T chemical sul t report at g slip on the of semiconduct ated cannot g aw material s aw material s	outer box tor devices puarantee suppliers.		Doped GaAs (mg) Total	1300-00-00 Total Wire Bond	100 100.00 % of Total Weight	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive Compliance with the above EU Directives has been verificated in a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this inny, is not below the threshold of regulatory concern for Aolding compounds used by Microchip meet the UL94 V(strp://ul.com/global/eng/pages/offerings/industries/chemical certain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the informatent their original packing materials is true and correct to the completeness and accuracy of data in this form becaupplier information is often protected from disclosure and information is often protected from disclosure and information is provided only as estimates of the average include trace levels of dopants, metals, and non-metal materical in the completeness and accuracy of data in this form becaupplier information is provided only as estimates of the average include trace levels of dopants, metals, and non-metal materials in the completeness and accuracy of the average include trace levels of dopants, metals, and non-metal materials.	ed via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world- of flammability standard for placals/plastics/ nipped are made from polyving ion in this form concerning so the best of its knowledge and buse it has been compiled bases trade secrets and some informedite in these parts and the atterials contained within silicon warranty, express or implied and its subsidiaries are collected.	s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. Istics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to holubstances restricted by RoHS in Microchip Technology Intelief, as of the date listed in this form. Microchip Technolod on the ranges provided in Material Safety Data Sheets; mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	to the best of tration of the or obtain a test of the packing corporated's ogy Incorporated by remblers and reponents. The on. The exclusion.	f Microchip T chemical sult report at g slip on the comment of the semiconduct ated cannot g aw material s aw material s ese estimates	cechnology bstance, if outer box for devices guarantee suppliers. s do not product		Doped GaAs (mg) Total Doped Gold	1300-00-00 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verificated in a chemical substance is absent from the list above, the acorporated's knowledge and belief as of the date of this my, is not below the threshold of regulatory concern folding compounds used by Microchip meet the UL94 Vittp://ul.com/global/eng/pages/offerings/industries/chemiche protective "tubes" in which the specific product is sland certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatent heir original packing materials is true and correct to the completeness and accuracy of data in this form becaupiler information is often protected from disclosure a information is provided only as estimates of the average include trace levels of dopants, metals, and non-metal microchip Technology Incorporated does not provide any varranties provided by Microchip Technology Incorporated ficrochip's quotations, sales order acknowledgement, and ficrochip disclaims any duty to notify users of updates of	ed via internal design controls chemical substance is NOT a document, there is no credib any regulatory scheme world flammability standard for placals/plastics/ apped are made from polyving ion in this form concerning stee best of its knowledge and the use it has been compiled bases trade secrets and some info weight of these parts and the terials contained within silicon warranty, express or implied and its subsidiaries are conditivoices.	in intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. In intentional content in the semiconductor device in the semiconductor of the	to the best of tration of the or obtain a test of obtain a test of the packing corporated's ogy incorporated by remblers and reponents. The on. The exclusion. These are ect or indirect of the contract of th	f Microchip T chemical sult report at g slip on the of semiconduct ated cannot g aw material s aw material s as ese estimates usive, limited e provided in tt, consequen	couter box cor devices guarantee suppliers. suppliers. suppliers.	0.10	Doped GaAs (mg) Total Doped Gold	1300-00-00 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100	0.4

QVCE 16 VQFN 11:05 AM: 8/29/2013

CROCHIP				ination Base opper Alloy (•	mogeneous Materials: (e.g. pc boards, displays)		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Devi	ce Type: 24 VQFN 4x4x0.9 (i	RK)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	18.03	(mg) Total	Mold Compound	% ot Total Weight	27.95
Silica, vitreous (or fused)	60676-86-0	Mold Compound	23,758	15.324	237.575		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	2.432	1.568	24,317		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	1.677	1.082	16,770		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.084	0.054	839		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	64.354	41.508	643,541			Total	100.00	-
Iron	7439-89-6	Lead Frame	1.583	1.021	15,830	43.45	(mg) Total	Lead Frame	% of Total Weight	67.36
Silver	7440-22-4	Lead Frame	1.283	0.828	12,832		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.084	0.054	842		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.056	0.036	556		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.170	0.110	1,702		Zinc	7440-66-6	0.13	
Epoxy resin	9003-36-5	Die Attach	0.046	0.030	460		Phosphorous	7723-14-0	0.08	
Copper(II) oxide	1317-38-0	Die Attach	0.007	0.004	69			Total	100.00	•
Gamma-butyrolactone	96-48-0	Die Attach	0.007	0.004	69	0.15	(mg) Total	Die Attach	% of Total Weight	0.23
Silicon	7440-21-3	Chip (Die)	2.910	1.877	29,100		Silver	7440-22-4	74.00	
Copper	7440-50-8	Wire Bond	0.323	0.209	3,234		Epoxy resin	9003-36-5	20.00	
Palladium	7440-05-3	Wire Bond	0.007	0.004	66		Copper(II) oxide	1317-38-0	3.00	
Tin		on external leads (pins) - Matte Tin / annealed at 150°C for 1		0.787	12,200		Gamma-butyrolactone	96-48-0	3.00	
		TOTA	ALS: 100.000	64.500				Total	100.00	
	0.0645 g Tot	al Mass		64.500	1,000,000	1.88	(mg) Total	Total Chip (Die)	% of Total Weight	
emiconductor device and its homogenous materials ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive) iance with the above EU Directives has been verified	comply with EU Directive 2002/95/E	tal Mass C (RoHS Directive), EU Directive 2011/65/EU (I			,,	1.88	(mg) Total Doped Silicon		% of Total Weight	2.91
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ance with the above EU Directives has been verifier mical substance is absent from the list above, the c orated's knowledge and belief as of the date of this	comply with EU Directive 2002/95/Ei d via internal design controls, suppli chemical substance is NOT an intent document, there is no credible reaso	tal Mass C (RoHS Directive), EU Directive 2011/65/EU (ler declarations, and /or analytical test data.	RoHS Recast Dire	ective) and with	n EU	0.21		Chip (Die) 7440-21-3	% of Total Weight	2.91
e 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ance with the above EU Directives has been verified mical substance is absent from the list above, the rated's knowledge and belief as of the date of this not below the threshold of regulatory concern for a grompounds used by Microchip meet the UL94 V0	comply with EU Directive 2002/95/Ei d via internal design controls, suppli chemical substance is NOT an intent document, there is no credible reaso ny regulatory scheme world-wide. flammability standard for plastics. Y	cal Mass C (RoHS Directive), EU Directive 2011/65/EU (ler declarations, and /or analytical test data. ional ingredient in the semiconductor device on to believe that the unavoidable impurity co	RoHS Recast Dire	ective) and with f Microchip Te e chemical sub	n EU		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	2.91
we 2002/53/EC (End-of-Life Vehicles (ELV) Directive) innce with the above EU Directives has been verified in the list above, the corated's knowledge and belief as of the date of this not below the threshold of regulatory concern for a g compounds used by Microchip meet the UL94 Voll.com/global/eng/pages/offerings/industries/chemicotective "tubes" in which the specific product is ship	comply with EU Directive 2002/95/Ei d via internal design controls, supplichemical substance is NOT an intentidocument, there is no credible reasony regulatory scheme world-wide. flammability standard for plastics. Yals/plastics/	tal Mass C (RoHS Directive), EU Directive 2011/65/EU (in the declarations, and /or analytical test data. It is in the semiconductor device on to believe that the unavoidable impurity contour can access the UL iQTM family of database.	RoHS Recast Dire	octive) and with f Microchip Te e chemical sub t report at	n EU chnology stance, if		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	2.91
e 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ance with the above EU Directives has been verified incal substance is absent from the list above, the control rated's knowledge and belief as of the date of this not below the threshold of regulatory concern for a propounds used by Microchip meet the UL94 V0 prompounds when the UL94 V0 prompou	comply with EU Directive 2002/95/Ei d via internal design controls, supplichemical substance is NOT an intent document, there is no credible reasony regulatory scheme world-wide. flammability standard for plastics. Y als/plastics/ pped are made from polyvinyl chlori	cal Mass C (RoHS Directive), EU Directive 2011/65/EU (I er declarations, and /or analytical test data. ional ingredient in the semiconductor device on to believe that the unavoidable impurity co fou can access the UL IQTM family of databas ide (PVC) plastic. "Window envelopes" used t	and, to the best oncentration of the est to obtain a test	octive) and with f Microchip Te e chemical sub t report at g slip on the o	n EU schnology stance, if uter box and		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8	% of Total Weight 100 100.00 % of Total Weight 98.00 2.00	0.33
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive) iance with the above EU Directives has been verified it is above, the context's knowledge and belief as of the date of this not below the threshold of regulatory concern for a grompounds used by Microchip meet the UL94 V0 il.com/global/eng/pages/offerings/industries/chemic otective "tubes" in which the specific product is shi "reels" may be made from PVC plastic. Thip Technology Incorporated believes the informating acking materials is true and correct to the beteness and accuracy of data in this form because it atton is often protected from disclosure as trade serileded only as estimates of the average weight of the:	comply with EU Directive 2002/95/Ei. Id via internal design controls, supplichemical substance is NOT an intent document, there is no credible reason yregulatory scheme world-wide. If ammability standard for plastics. Yals/plastics/ pped are made from polyvinyl chlorid in this form concerning substancest of its knowledge and belief, as of has been compiled based on the racrets and some information may not see parts and the average weight of a	cal Mass C (RoHS Directive), EU Directive 2011/65/EU (if the data and for analytical test data. In a dipredient in the semiconductor device on to believe that the unavoidable impurity control can access the UL iQTM family of database and (PVC) plastic. "Window envelopes" used the date listed in this form. Microchip Technological forms and the date listed in this form. Microchip Technological forms are provided by subcontract assemble inticipated significant toxic metals component in the date is described in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract assemble inticipated significant toxic metals component in the date is described by subcontract as desc	and, to the best on centration of the est o obtain a test o hold the packing lincorporated's ology Incorporated's and raw mater	of Microchip Te ochemical sub treport at g slip on the o semiconductod cannot guar material suppliers. I	chnology stance, if uter box and or devices in antee the ers. Supplier		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3	% of Total Weight 100 100.00 % of Total Weight 98.00 2.00	0.33
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive)	comply with EU Directive 2002/95/Ei. Id via internal design controls, supplichemical substance is NOT an intent document, there is no credible reason yregulatory scheme world-wide. If ammability standard for plastics. Yals/plastics/ pped are made from polyvinyl chlorid in this form concerning substances to fits knowledge and belief, as of has been compiled based on the racrets and some information may not see parts and the average weight of an ed within silicon devices (silicon IC) warranty, express or implied, with results in the silicon devices (silicon IC)	cal Mass C (RoHS Directive), EU Directive 2011/65/EU (if the data) or declarations, and /or analytical test data. In a lingredient in the semiconductor device on to believe that the unavoidable impurity control of the data access the UL iQTM family of databased (PVC) plastic. "Window envelopes" used the date listed in this form. Microchip Technologist the date listed in this form. Microchip Technologist provided in Material Safety Data Sheets have been provided by subcontract assemble in the finished parts. Respect to the information provided in this decisions and the second of the	and, to the best of and, to the best of and, to the best of an anterior of the action of the packing of the packing and the pa	ortive) and with f Microchip Te chemical sub t report at g slip on the o semiconducte d cannot guar naterial suppli rial suppliers. I se do not inclu usive, limited p	chnology stance, if uter box and or devices in cantee the ers. Supplier information de trace		Doped Silicon (mg) Total Copper Palladium (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3	% of Total Weight 100 100.00 % of Total Weight 98.00 2.00	0.33
we 2002/53/EC (End-of-Life Vehicles (ELV) Directive) iance with the above EU Directives has been verified in the substance is absent from the list above, the corated's knowledge and belief as of the date of this not below the threshold of regulatory concern for a grompounds used by Microchip meet the UL94 V0 il.com/global/eng/pages/offerings/industries/chemic objective "tubes" in which the specific product is shi "reels" may be made from PVC plastic. Thip Technology Incorporated believes the informatinginal packing materials is true and correct to the betteness and accuracy of data in this form because it ation is often protected from disclosure as trade set ided only as estimates of the average weight of the of dopants, metals, and non-metal materials contain hip Technology Incorporated does not provide any ties provided by Microchip Technology Incorporated to the p	comply with EU Directive 2002/95/Ei . d via internal design controls, supplichemical substance is NOT an intent document, there is no credible reason regulatory scheme world-wide. flammability standard for plastics. Y als/plastics/ pped are made from polyvinyl chlori on in this form concerning substance est of its knowledge and belief, as of has been compiled based on the ra crets and some information may not se parts and the average weight of a ed within silicon devices (silicon IC) warranty, express or implied, with re d and its subsidiaries are contained changes to Material Content Declar the users' reliance on the informatio	cal Mass C (RoHS Directive), EU Directive 2011/65/EU (in the foliations, and /or analytical test data. It is a formal ingredient in the semiconductor device on to believe that the unavoidable impurity control of the data is the unavoidable impurity control of the data is the unavoidable impurity control of the data listed in this form. Microchip Technologist the data listed in this form. Microchip Technologist the data listed in Material Safety Data Sheets have been provided by subcontract assemblicity and the provided in Material Safety Data Sheets have been provided by subcontract assemblicity in the finished parts. In the finished parts. In the finished parts. In the finished parts and conditions at ions and shall not be liable for any damages ations and shall not be liable for any damages.	and, to the best on centration of the est o obtain a test o hold the packing linear provided by raw rest and raw maters. These estimate aration. The exclusion of sale. These are, direct or indirect.	of Microchip Te chemical sub t report at g slip on the o semiconducte d cannot guar naterial suppli rial suppliers. I se do not inclu usive, limited p e provided in I	chnology stance, if utter box and or devices in antee the ers. Supplier information de trace	0.21	Doped Silicon (mg) Total Copper Palladium (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total	% of Total Weight 100 100.00 % of Total Weight 98.00 2.00	0.33

24 VQFN 11:05 AM : 8/29/2013

Halogen-Free

Semiconductor Device T	ype: 28 VQFN 5x5x0.9	(RM/MW)		nation Base Al oper Alloy (Cu	,			omogeneous Materials: s (e.g. pc boards, displays)		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	26.81	(mg) Total	Mold Compound	% ot Total Weight	40.57
Silica, vitreous (or fused)	60676-86-0	Mold Compound	34.485	22.787	344.845		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	3,530	2.332	35.296		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	2.434	1.608	24.342		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.122	0.080	1,217		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	50.721	33.515	507,209			Total	100.00	•
Iron	7439-89-6	Lead Frame	1.248	0.824	12,476	35.08	(mg) Total	Lead Frame	% of Total Weight	53.09
Silver	7440-22-4	Lead Frame	1.011	0.668	10,114		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.066	0.044	664		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.044	0.029	438		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.840	0.555	8,400		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.160	0.106	1,600		Phosphorous	7723-14-0	0.08	
Silicon	7440-21-3	Chip (Die)	3.290	2.174	32,900			Total	100.00	ч
Gold	7440-57-5	Wire Bond	0.470	0.311	4,700	0.66	(mg) Total	Die Attach	% of Total Weight	1
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.580	1.044	15.800		Silver	7440-22-4	84.00	
		TOTALS:	100.000	66.078	1,000,000		Epoxy resin	Trade Secret	16.00	
	0.0661 a To	ntal Mass						Total	100.00	<u>u</u>
ance with the above EU Directives has										
emical substance is absent from the lis hip Technology Incorporated's knowle	t above, the chemical substa dge and belief as of the date	sign controls, supplier declarations, and /c ince is NOT an intentional ingredient in the of this document, there is no credible reas	semiconductor son to believe th	r device and, to at the unavoid			Doped Silicon	7440-21-3 Total	100	
emical substance is absent from the lis hip Technology Incorporated's knowle ty concentration of the chemical substa g compounds used by Microchip meet at http://ul.com/global/eng/pages/offeri otective "tubes" in which the specific p	t above, the chemical substa dge and belief as of the date ance, if any, is not below the the UL94 V0 flammability sta ngs/industries/chemicals/pla product is shipped are made	unce is NOT an intentional ingredient in the of this document, there is no credible reas threshold of regulatory concern for any re-	e semiconductor son to believe th gulatory schem . iQTM family of	r device and, to nat the unavoid ne world-wide. databases to o	lable obtain a test	0.31	(mg) Total	Total Wire Bond	100.00 % of Total Weight	0.47
emical substance is absent from the liship Technology Incorporated's knowled by concentration of the chemical substance of the compounds used by Microchip meet at http://ul.com/global/eng/pages/offeri	t above, the chemical substa dge and belief as of the date ance, if any, is not below the the UL94 V0 flammability sta ngs/industries/chemicals/pla product is shipped are made	unce is NOT an intentional ingredient in the of this document, there is no credible reas threshold of regulatory concern for any reandard for plastics. You can access the UL stics/	e semiconductor son to believe th gulatory schem . iQTM family of	r device and, to nat the unavoid ne world-wide. databases to o	lable obtain a test	0.31		Total Wire Bond 7440-57-5	100.00 % of Total Weight	0.47
emical substance is absent from the liship Technology Incorporated's knowler by concentration of the chemical substance is geompounds used by Microchip meet at http://ul.com/global/eng/pages/offeriotective "tubes" in which the specific protective "tubes" in which the specific protection in the specif	t above, the chemical substated and belief as of the date ance, if any, is not below the the UL94 V0 flammability stangs/industries/chemicals/platoroduct is shipped are made to be made from PVC plastic. the information in this form on the information in the in	ince is NOT an intentional ingredient in the of this document, there is no credible reas threshold of regulatory concern for any restandard for plastics. You can access the UL istics/ from polyvinyl chloride (PVC) plastic. "Win concerning substances restricted by RoHS ect to the best of its knowledge and belief, and accuracy of data in this form because is. Supplier information is often protected fraw material suppliers. Information is provide metals components. These estimates de	semiconductors on to believe the gulatory scheme. iQTM family of andow envelopes. in Microchip Tras of the date list has been comifrom disclosure ided only as estimated.	r device and, to nat the unavoid ne world-wide. databases to o " used to hold echnology Inco isted in this for piled based on as trade secre timates of the a	able btain a test the packing proporated's m. the ranges ts and some average	0.31	(mg) Total	Total Wire Bond	100.00 % of Total Weight	0.47
emical substance is absent from the liship Technology Incorporated's knowled by concentration of the chemical substance is goompounds used by Microchip meet at http://ul.com/global/eng/pages/offeriotective "tubes" in which the specific page to the outer box and certain "reels" may hip Technology Incorporated believes and uctor devices in their original packing Technology Incorporated cannot god in Material Safety Data Sheets proviation may not have been provided by sof these parts and the average weight, and non-metal materials contained withip Technology Incorporated does not	t above, the chemical substated and belief as of the date ance, if any, is not below the the UL94 V0 flammability states of the discount of the UL94 V0 flammability states or oduct is shipped are made to be made from PVC plastic. The information in this form or an area of the information in this form or an area of the information in this form or an area of the information in this form or an area of the information in the inform	ince is NOT an intentional ingredient in the of this document, there is no credible reas threshold of regulatory concern for any readand for plastics. You can access the UL istics/ from polyvinyl chloride (PVC) plastic. "Win concerning substances restricted by RoHS ect to the best of its knowledge and belief, and accuracy of data in this form because is. Supplier information is often protected fraw material suppliers. Information is provicic metals components. These estimates do C) in the finished parts. ss or implied, with respect to the information corporated and its subsidiaries are contained.	semiconductors son to believe the gulatory schem. IQTM family of andow envelopes. In Microchip T as of the date lift has been comerom disclosure ided only as eston not include training provided in provided in	r device and, to nat the unavoid e world-wide. databases to o " used to hold echnology Inco isted in this for piled based on as trade secre timates of the a ace levels of do this declaration	able the packing proporated's rm. the ranges tests and some average opants, n. The	0.31	(mg) Total	Total Wire Bond 7440-57-5	100.00 % of Total Weight	0.47
emical substance is absent from the liship Technology Incorporated's knowle by concentration of the chemical substance is geompounds used by Microchip meet at http://ul.com/global/eng/pages/offeriotective "tubes" in which the specific pages the outer box and certain "reels" may thip Technology Incorporated believes brouductor devices in their original packing the provided by a fet and the specific page of these parts and the average weight, and non-metal materials contained withip Technology Incorporated does not tive, limited product warranties provided ons of sale. These are provided in Microbip disclaims any duty to notify users at, consequential or otherwise, suffered t, consequential or otherwise, suffered	t above, the chemical substated dge and belief as of the date ance, if any, is not below the the UL94 V0 flammability states angs/industries/chemicals/plate be made from PVC plastic. The information in this form the information in the information i	ince is NOT an intentional ingredient in the of this document, there is no credible reas threshold of regulatory concern for any readand for plastics. You can access the UL istics/ from polyvinyl chloride (PVC) plastic. "Win concerning substances restricted by RoHS ect to the best of its knowledge and belief, and accuracy of data in this form because is. Supplier information is often protected fraw material suppliers. Information is provicic metals components. These estimates do C) in the finished parts. ss or implied, with respect to the information corporated and its subsidiaries are contained.	semiconductors on to believe the gulatory scheme. iQTM family of andow envelopes. is in Microchip That as of the date lift has been compared to a serior on the control of the control o	r device and, to nat the unavoid e world-wide. databases to describe a second of the control of	able obtain a test the packing orporated's rm. the ranges ests and some average opants, n. The terms and		(mg) Total Gold	Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C	100.00 % of Total Weight 100.00	0.47

28 VQFN 11:05 AM : 8/29/2013

MICROCHIP Semiconductor Device	a Type: E7K 32	VQFN 5x5x0.9 (RN)		nation Base A pper Alloy (C			Package Ho	mogeneous Materials		JEDEC 97 Product Marking and/or Pkg. Labeling e3
	·	"Contained In" Sub-Component	% Total Weight			18.20	(mg) Total	Mold Compound	% ot Total Weight	
Basic Substance	CAS Number			mg/part	ppm		1 0 0			1
Silica, vitreous (or fused)	60676-86-0	Mold Compound	24.327 2.490	15.472 1.584	243,270 24,899		Silica, vitreous (or fused) Epoxy Resin	60676-86-0 Trade Secret	85.00 8.70	l
Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	1,717	1.584	17,172		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound Mold Compound	0.086	0.055	859		Carbon Black	1333-86-4	0.30	ł
Copper	7440-50-8	Lead Frame	62.166	39,538	621.663		Carbon Black	Total	100.00	<u>l</u>
Iron	7439-89-6	Lead Frame	1.529	0.973	15,291	41.38	(mg) Total	Lead Frame	% of Total Weight	65.07
Silver	7440-22-4	Lead Frame	1.240	0.788	12,396		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.081	0.052	813		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.054	0.034	537		Silver	7440-22-4	1.91	l
Silver	7440-22-4	Die Attach	0.363	0.231	3,626		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.098	0.062	980		Phosphorous	7723-14-0	0.08	J
Metal oxide	Trade Secret	Die Attach	0.015	0.009	147			Total	100.00	
Gamma-butyrolactone	96-48-0	Die Attach	0.015	0.009	147	0.31	(mg) Total	Die Attach	% of Total Weight	0.49
Silicon	7440-21-3	Chip (Die)	2.410	1.533	24,100		Silver	7440-22-4	74	1
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.648	0.412	6,485		Epoxy resin	Trade Secret	20	
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.012	0.007	116		Metal oxide	Trade Secret	3	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.750	1.749	27,500		Gamma-butyrolactone	96-48-0	3	
		TOTALS:	100.000	63.600	1,000,000			Total	100.00	
	0.0636	g Total Mass				1.53	Total (mg)	Chip (Die)	% of Total Weight	2.41
his semiconductor device and its homogenous materials on 002/53/EC (End-of-Life Vehicles (ELV) Directive).	comply with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	tive) and with	FU Directive					
					20 2 00 10		Doped Silicon	7440-21-3	100	
Compliance with the above EU Directives has been verified	via internal design control	s, supplier declarations, and /or analytical test data.			20 2000		Doped Silicon	7440-21-3 Total	100	J
, , , ,	hemical substance is NOT a locument, there is no credi	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce			hnology	0.42	Doped Silicon			
compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch acorporated's knowledge and belief as of the date of this d	hemical substance is NOT a document, there is no credi ny regulatory scheme world flammability standard for pl	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	ntration of the	chemical subs	hnology	0.42	· ·	Total Wire Bond palladium coated copper	100.00	
compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch acorporated's knowledge and belief as of the date of this d ny, is not below the threshold of regulatory concern for an folding compounds used by Microchip meet the UL94 V0 fl	hemical substance is NOT a locument, there is no credi ny regulatory scheme world flammability standard for pl als/plastics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide. lastics. You can access the UL iQTM family of databases t	ntration of the	chemical subs	chnology tance, if	0.42	(mg) Total	Total Wire Bond palladium coated copper (CuPd)	100.00 % of Total Weight	
compliance with the above EU Directives has been verified in a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for an lolding compounds used by Microchip meet the UL94 V0 ff ttp://ul.com/global/eng/pages/offerings/industries/chemica/he protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information heir original packing materials is true and correct to the be ompleteness and accuracy of data in this form because it hormation is often protected from disclosure as trade secrovided only as estimates of the average weight of these p	hemical substance is NOT a document, there is no credit ny regulatory scheme world (lammability standard for pl als/plastics/ oped are made from polyvir on in this form concerning a set of its knowledge and be has been compiled based of rets and some information parts and the average weigt	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases the third of	ntration of the oo obtain a test old the packing ncorporated's gy Incorporate vided by raw mund raw materia	report at g slip on the outline of the conductor of the	chnology tance, if ater box and r devices in untee the rs. Supplier formation is	0.42	(mg) Total	Total Wire Bond palladium coated copper (CuPd) 7440-50-8	100.00 % of Total Weight	0.66
compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chocorporated's knowledge and belief as of the date of this don, is not below the threshold of regulatory concern for an holding compounds used by Microchip meet the UL94 V0 flttp://ul.com/global/eng/pages/offerings/industries/chemica the protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information heir original packing materials is true and correct to the be ompleteness and accuracy of data in this form because it Information is often protected from disclosure as trade secre	hemical substance is NOT a locument, there is no credi ny regulatory scheme world: l'ammability standard for pl als/plastics/ oped are made from polyvir on in this form concerning set of its knowledge and be has been compiled based of rets and some information parts and the average weigt in silicon devices (silicon I warranty, express or implier	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic in the lastic in the substances restricted by RoHS in Microchip Technology I lidef, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets proway not have been provided by subcontract assemblers and tof anticipated significant toxic metals components. The ICO in the finished parts. d, with respect to the information provided in this declaration.	ntration of the oo obtain a test old the packing ncorporated's gy Incorporate vided by raw mund raw matericse estimates dition. The exclution of the object	report at g slip on the ou semiconducto d cannot guara taterial suppliers. In o not include to	chnology tance, if the box and or devices in intee the rs. Supplier formation is race levels	0.42	(mg) Total Copper Palladium	Total Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3	100.00 % of Total Weight 98	0.66
compliance with the above EU Directives has been verified in a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this down, is not below the threshold of regulatory concern for an idolding compounds used by Microchip meet the UL94 V0 fl ttp://ul.com/global/eng/pages/offerings/industries/chemica/he protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information licrochip Technology Incorporated believes the information in formation is often protected from disclosure as trade secrovided only as estimates of the average weight of these p if dopants, metals, and non-metal materials contained with licrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated	hemical substance is NOT a locument, there is no credity regulatory scheme world: l'ammability standard for plals/plastics/ oped are made from polyvir on in this form concerning sets of its knowledge and be has been compiled based crets and some information barts and the average weight in silicon devices (silicon I warranty, express or implied and its subsidiaries are conchanges to Material Conter he users' reliance on the in	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics are restricted by RoHS in Microchip Technology II like, as of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets provided in the ranges provided in Material Safety Data Sheets provided in the family of the lastic components. The IC in the finished parts. d, with respect to the information provided in this declarationtained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, dinterest the lastic can be reasonable for the provided in the provided in the lastic conditions of the Declarations and shall not be liable for any damages, dinterest and conditions of the Declarations and shall not be liable for any damages, dinterest and conditions of the Declarations and shall not be liable for any damages, dinterest and conditions of the provided in the pr	ntration of the oo obtain a test old the packing incorporated's gy Incorporate vided by raw mand raw materia se estimates dition. The exclusiale. These are rect or indirect or indirect	report at g slip on the ou semiconducto d cannot guara laterial suppliers. In o not include to sive, limited p p provided in N t, consequentia	chnology tance, if the box and r devices in intee the rs. Supplier formation is race levels roduct licrochip's		(mg) Total Copper Palladium	Total Wire Bond palladium coated copper (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin /	98 2	0.66

EZK 11:05 AM : 8/29/2013

Basic Substance CAS Number Storo, vitrous for fused) Sign, vitrous for fused in the fuse fused for fused fused for fused for fused for fused for fused for fused for fused fused for fused for fused for fused fused for fused fused for fu	MICROCHIP	1570	VATE		nination Base Copper Alloy				ogeneous Materials: .g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Salic Substance	Semiconductor Device I	ype: AEZC 36 (L		% Total		1					es
Sites vireous for fused 60076-89-01 Moid Compound 1-6731 22-1144 147,305 Epocy Residual For Sport	Basic Substance	CAS Number			mg/part	ppm	26.10	(mg) Total	Mold Compound	% ot Total Weight	17.33
Epocy Ream	Silica, vitreous (or fused)	60676-86-0	Mold Compound	14,731				Silica, vitreous (or fused)	60676-86-0	85.00	
Captor Black 1333-80-4 Modd Compound 0.050 0.078 50.0 Captor Black 1338-80-4 0.30 Copper 7440-50-8 Lead Frame 7.23-22 10.9-17 772-3-17 14.00 Copper 7440-50-8 Lead Frame 1.776 2.679 1.7760 Copper 7440-50-8 Lead Frame 1.776 2.679 1.7760 Copper 7440-50-8 Lead Frame 1.776 2.679 1.7760 Copper 7440-50-8 Lead Frame 0.050 0.050 0.050 Copper 7440-50-8 Copper 0.050 0.050 0.050 0.050 Copper 7440-50-8 Copper 0.050 0.050 0.050 0.050 0.050 Copper 7440-50-8 Copper 0.050 0.050 0.050 0.050 0.050 0.050 Copper 7440-50-8 Copper 0.050 0.050 0.050 0.050 0.050 0.050 0.050 Copper 0.050 0.050 0.050 0.050 0.050 0.050 0.050 0.050 0.050 0.050 Copper 0.050 0.05							1		Trade Secret	8.70	
Copper 740-05-09 Lead Frame 72-302 108-97 72-32-19 114.00 (mg) Total Lead Frame 1, 17-9 2-57-9 17-57-9 14.00 (mg) Total Lead Frame 1, 1462 2, 172 14.621 14.	Phenolic Resin	Trade Secret	Mold Compound	1.040	1.566	10,398	1	Phenolic Resin	Trade Secret	6.00	
Since 1740-224 Lead Frame 1.779 2.679 17790 11400 (mg) Total Lead Frame 9.00 17790 11400 (mg) To	Carbon Black			0.052			1	Carbon Black	1333-86-4	0.30	
Silver 7440-22-4 Lead Frame 1,442 2,172 14.4.21	Copper	7440-50-8	Lead Frame	72.322	108.917	723,219		•	Total	100.00	-
Procession 1744-08-6 Clead Frame 0.085 0.143 946 Section 1745-08-6 2.35 Section 1746-08-6	Iron	7439-89-6	Lead Frame	1.779	2.679	17,790	114.00	(mg) Total	Lead Frame	% of Total Weight	75.7
Phosphorous 7722-14-0 Lead Frame 0.082 0.094 025 Epoy ream 17rade Secret De Attach 0.143 0.215 1.145 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.048 0.072 475 Epoy ream 17rade Secret De Attach 0.058 0.072 475 Epoy ream 17rade Secret De Attach 0.058 0.072 475 Epoy ream 17rade Secret 0.058 0.072 1.0	Silver	7440-22-4	Lead Frame	1.442	2.172	14,421		Copper	7440-50-8	95.54	
Silver 7440-92-4 Die Attach 0.048 0.072 475 Die Die Attach 0.048 0.072 475 Die	Zinc	7440-66-6	Lead Frame	0.095	0.143	946	1	Iron	7439-89-6	2.35	
Epocy resin	Phosphorous	7723-14-0	Lead Frame	0.062	0.094	625	1	Silver	7440-22-4	1.91	
Epory resim 1 Trade Secret Die Attach 0.48 0.072 475 Phosphorous 7723-14-0 0.08 Phosphorous 7723-14-0 0.09 Phosphorous 7723-14-0 Phosphorous 7	Silver	7440-22-4	Die Attach	0.143	0.215	1.425	1	Zinc	7440-66-6	0.13	
Copper 7440-95-3 Wire Bond 0.764 1.151 7.644 0.29 (mg) Total Disease Name Name Name Name Name Name Name Nam	Epoxy resin	Trade Secret	Die Attach	0.048	0.072	475	1	Phosphorous		0.08	
Copper 7440-95-5 Wire Bond 7440-95-3 Wire Bond 10.16 10.023 158 Tin 7440-95-10 Please on external leads girely - Males Tin / arresided set 1907-104 17.000 17.000. 150.00 1	Silicon	7440-21-3	Chip (Die)	4.210	6.340	42,100			Total	100.00	
Palladium 7440-93-15 Putry on external basis prior y an external basis prior y and y to protect y to	Copper			0.764	1.151		0.29	(mg) Total	Die Attach	% of Total Weight	0.19
Tin 7440-31-5 Retired note into the complete was because the Strict of the complete and the strict of the strict of the complete and the strict of the strict of the complete and the strict of the s				0.016	0.023						****
O.1506 g Total Mass 15 semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU certive 2002/95/EC (RoH-O-Line Vehicles (ELV) Directive) and a semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU certificate of the above EU Directive's has been verified via internal design controls, supplier declarations, and /or analytical test data. 15 tal 100.00 1.17 (mg) Total 100.00 1.17 (mg)							i				
1.1506 g Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU ective 2002/95/EC (RoHS Directive). Impliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In the above EU Directive via the above EU Directives has been verified via internal design controls, supplier of the chemical substance, if via internal design controls, and in the supplier of the chemical substance is a described by Alfa Directive via the supplier of the chemical substance, if via internal design controls, and the via	1111	7440 01 0						грому госит			
is semiconductor device and its homogenous materials comply with EU Directive 2002/35/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Doped Silicon 7440-21-3 100		0.4500		100.000	100.000	1,000,000					101
mpliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. I chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Iding compounds used by Microchip meet the U.94 V0 flammability standard for plastics. You can access the U. LQTM family of databases to obtain a test report at pri/ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ perotective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and train "reels" may be made from PVC plastic. Total 100.00 Total Wire Bond % of Total Weight 0.78 Palladium 7.440-05-3 2.00 Palladium 7.440-05-3 2.00 Total 100.00		0.1506	g rotal mass				6.34	(mg) i otal	Chip (Die)	% of Total Weight	4.21
the hemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the list of the list o											
corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if (mg) Total Wire Bond % of Total Weight 0.78 y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Idding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at p://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ e protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and rain "reels" may be made from PVC plastic. Total 7440-05-3 2.00 Palladium 7440-05-3 2.00 Palladium 7440-05-3 2.00 Total 100.00 Palladium 7440-05-3 2.00 Total 100.00 Total 10		ply with EU Directive 200	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS	S Recast Dire	ective) and wit	th EU		Doped Silicon			
p://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ e protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ratin "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated semiconductor devices in itri original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the mpleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information in to the naterial some information is often protected by subcontract assemblers and raw material suppliers. Information is obtained only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product range provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's of microchip's of the series of updates	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).			S Recast Dire	ective) and wit	th EU		Doped Silicon			
ratin "reels" may be made from PVC plastic. Palladium 7440-95-3 2.00 Total 100.00 T	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem corporated's knowledge and belief as of the date of this docu ly, is not below the threshold of regulatory concern for any re	internal design controls, ical substance is NOT a ment, there is no credibl gulatory scheme world-	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide.	to the best o	of Microchip To	echnology	1.17	<u> </u>	Total	100.00	0.78
in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the impleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier ormation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is obtained within silicon devices (silicon IC) in the finished parts. Crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product rranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtained, sale or the substance of the data of the substance of	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem corporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re olding compounds used by Microchip meet the UL94 V0 flamn	internal design controls, ical substance is NOT a ment, there is no credibl gulatory scheme world- nability standard for pla	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide.	to the best o	of Microchip To	echnology	1.17	(mg) Total	Total Wire Bond	100.00 % of Total Weight	0.78
corrocting Technology Incorporated does not provided any warranty, express or implied, with respect to the information provided in Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's or this Certificate of Compliance for semiconductor products.	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem acorporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re lolding compounds used by Microchip meet the UL94 V0 flami ttp://ul.com/global/eng/pages/offerings/industries/chemicals/p	internal design controls, ical substance is NOT ar ment, there is no credibl gulatory scheme world- nability standard for pla- lastics/	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to	to the best o tration of the o obtain a tes	of Microchip To e chemical sub st report at	echnology ostance, if	1.17	(mg) Total Copper	Total Wire Bond 7440-57-5	100.00 % of Total Weight 98.00	0.78
rranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's of annealed at 150°C for danaeled at 150°C	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem icorporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re lolding compounds used by Microchip meet the UL.94 VO flam! ttp://ul.com/global/eng/pages/offerings/industries/chemicals/p he protective "tubes" in which the specific product is shipped ertain "reels" may be made from PVC plastic.	internal design controls, ical substance is NOT at ment, there is no credibl gulatory scheme world- nability standard for pla- lastics/ are made from polyviny	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to /I chloride (PVC) plastic. "Window envelopes" used to hold	to the best of tration of the o obtain a tes	of Microchip To e chemical substitute of the streport at ng slip on the o	echnology sstance, if outer box and	1.17	(mg) Total Copper	Total Wire Bond 7440-57-5 7440-05-3	100.00 % of Total Weight 98.00 2.00	0.78
nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or Tin 7440-31-5 100.00 this Certificate of Compliance for semiconductor products.	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem corporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re lolding compounds used by Microchip meet the UL94 V0 flamm ttp://ul.com/global/eng/pages/offerings/industries/chemicals/p he protective "tubes" in which the specific product is shipped ertain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information in heir original packing materials is true and correct to the best o ompleteness and accuracy of data in this form because it has formation is often protected from disclosure as trade secrets forvided only as estimates of the average weight of these parts	internal design controls, ical substance is NOT an ment, there is no credibigulatory scheme world-mability standard for platastics/ are made from polyviny this form concerning suf its knowledge and belibeen compiled based or and some information is and the average weight	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide. stics. You can access the UL iQTM family of databases to // chloride (PVC) plastic. "Window envelopes" used to hole instances restricted by RoHS in Microchip Technology Inter anges provided in Material Safety Data Sheets proving you have been provided by subcontract assemblers at to fanticipated significant toxic metals components. Thes	to the best of tration of the obtain a tes obtain a tes of the packin corporated's y Incorporated ided by raw and raw mater	of Microchip To e chemical substitute of the control of semiconducted cannot gua material suppirial suppirial suppiliers.	echnology ustance, if outer box and or devices in rantee the liers. Supplier Information is	1.17	(mg) Total Copper	Total Wire Bond 7440-57-5 7440-05-3	100.00 % of Total Weight 98.00 2.00	0.78
Total 100.00	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem corporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re lolding compounds used by Microchip meet the UL.94 V0 flami ttp://ul.com/global/eng/pages/offerings/industries/chemicals/p he protective "tubes" in which the specific product is shipped ertain "reels" may be made from PVC plastic. licrochip Technology Incorporated believes the information in neir original packing materials is true and correct to the best o ompleteness and accuracy of data in this form because it has iformation is often protected from disclosure as trade secrets rovided only as estimates of the average weight of these parts f dopants, metals, and non-metal materials contained within si licrochip Technology Incorporated does not provide any warra-	internal design controls, ical substance is NOT at ment, there is no crediblication, there is no credible gulatory scheme world-nability standard for plailastics/ are made from polyviny this form concerning suffice is knowledge and belibeen compiled based or and some information not and the average weight illicon devices (silicon IC anty, express or implied,	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide. stics. You can access the UL iQTM family of databases to // chloride (PVC) plastic. "Window envelopes" used to hol abstances restricted by RoHS in Microchip Technology Intervals of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets proviay not have been provided by subcontract assemblers a to fanticipated significant toxic metals components. Thes in the finished parts. with respect to the information provided in this declaration.	to the best of tration of the obtain a test obtain a test of the packin corporated's y Incorporate ided by raw and raw mates e estimates on. The excli	of Microchip To e chemical substance of the streport at g slip on the construction semiconducted do cannot gua material suppliers. do not include usive, limited	echnology stance, if outer box and or devices in rantee the liers. Supplier Information is e trace levels		(mg) Total Copper Palladium	Total Wire Bond 7440-57-5 7440-05-3 Total Plating on external leads (pins) - Matte Tin	98.00 2.00	
	irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via a chemical substance is absent from the list above, the chem corporated's knowledge and belief as of the date of this docu ny, is not below the threshold of regulatory concern for any re olding compounds used by Microchip meet the UL94 V0 flamm tp://ul.com/global/eng/pages/offerings/industries/chemicals/p he protective "tubes" in which the specific product is shipped artain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in eier original packing materials is true and correct to the best o ompleteness and accuracy of data in this form because it has formation is often protected from disclosure as trade secrets ovided only as estimates of the average weight of these parts id opants, metals, and non-metal materials contained within si icrochip Technology Incorporated does not provide any warra arranties provided by Microchip Technology Incorporated and uotations, sales order acknowledgement, and invoices. icrochip disclaims any duty to notify users of updates or char	internal design controls, ical substance is NOT at ment, there is no credibligulatory scheme world-mability standard for platastics/ are made from polyviny this form concerning suf its knowledge and belibeen compiled based or and some information in and the average weight lilicon devices (silicon IC anty, express or implied, its subsidiaries are congest to Material Contents	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide. stics. You can access the UL iQTM family of databases to dictional control of the	to the best of tration of the poblain a test of the packin corporated's y Incorporate fided by raw ind raw mates e estimates on. The exclusion. The exclusion ale. These are ect or indirect or the tration of the packing that is a second to the packing tha	of Microchip To e chemical substance of the streport at ag slip on the of semiconducted cannot gua material supp rial suppliers, do not include usive, limited re provided in ct, consequent	echnology stance, if outer box and or devices in rantee the liers. Supplier Information is a trace levels product Microchip's		(mg) Total Copper Palladium (mg) Total	Total Wire Bond 7440-57-5 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 98.00 2.00 100.00	
	ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via chemical substance is absent from the list above, the chem orporated's knowledge and belief as of the date of this docu r, is not below the threshold of regulatory concern for any re Iding compounds used by Microchip meet the UL94 V0 flamp p://ul.com/global/eng/pages/offerings/industries/chemicals/p a protective "tubes" in which the specific product is shipped tain "reels" may be made from PVC plastic. prochip Technology Incorporated believes the information in ir original packing materials is true and correct to the best o mpleteness and accuracy of data in this form because it has ormation is often protected from disclosure as trade secrets voided only as estimates of the average weight of these parts dopants, metals, and non-metal materials contained within si crochip Technology Incorporated does not provide any warra rranties provided by Microchip Technology Incorporated and otations, sales order acknowledgement, and invoices. crochip disclaims any duty to notify users of updates or chai erwise, suffered by users or third parties as a result of the u	internal design controls, ical substance is NOT at ment, there is no credibligulatory scheme world-mability standard for platastics/ are made from polyviny this form concerning suf its knowledge and belibeen compiled based or and some information in and the average weight lilicon devices (silicon IC anty, express or implied, its subsidiaries are congest to Material Contents	, supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen wide. stics. You can access the UL iQTM family of databases to dictional control of the	to the best of tration of the poblain a test of the packin corporated's y Incorporate fided by raw ind raw mates e estimates on. The exclusion. The exclusion ale. These are ect or indirect or the tration of the packing that is a second to the packing tha	of Microchip To e chemical substance of the streport at ag slip on the of semiconducted cannot gua material supp rial suppliers. do not include usive, limited are provided in ct, consequent	echnology stance, if outer box and or devices in rantee the liers. Supplier Information is a trace levels product Microchip's		(mg) Total Copper Palladium (mg) Total	Total Wire Bond 7440-57-5 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 4 hours.	100.00 % of Total Weight 98.00 2.00 100.00 % of Total Weight	

36 VQFN 11:06 AM: 8/29/2013

MICROCHIP Semiconductor Dev	ice Type: NQ 72 (Lead) VC	QFN 3x3x0.9mm (qv)		mination Bas Copper Alloy				ogeneous Materials: .g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	ma/nort		180.05	(mg) Total	Mold Compound	% ot Total Weight	52.8
			44.880	mg/part	ppm		Silica, vitreous (or fused)	60676-86-0	85.00	1
Silica, vitreous (or fused) Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	44.880	153.041 15.664	448,800 45,936		Epoxy Resin	Trade Secret	85.00	
Phenolic Resin	Trade Secret	Mold Compound	3.168	10.803	31,680		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.158	0.540	1,584		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	36.486	124.416	364.858		Calboil Black	Total	100.00	1
Iron	7439-89-6	Lead Frame	0.897	3.060	8,975	130.23	(mg) Total	Lead Frame	% of Total Weight	38.19
-						130.23				38.19
Silver Zinc	7440-22-4 7440-66-6	Lead Frame Lead Frame	0.728 0.048	2.481 0.163	7,275 477		Copper	7440-50-8 7439-89-6	95.54 2.35	
	7723-14-0	Lead Frame Lead Frame	0.048	0.163	315		Iron Silver	7439-89-6 7440-22-4	2.35 1.91	
Phosphorous Silver	7440-22-4	Die Attach	0.032	2.182	6,400		Zinc	7440-22-4 7440-66-6	1.91 0.13	
Epoxy Resin	Trade secret	Die Attach	0.640	0.546	1.600		Phosphorous	7723-14-0	0.13	
							Phosphorous		0.00	J
Silicon	7440-21-3	Chip (Die)	5.720	19.505	57,200			Total		
Doped Gold	7440-57-5	Wire Bond	0.970	3.308	9,700	2.73	(mg) Total	Die Attach	% of Total Weight	0.8
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.520	5.183	15,200		Silver	7440-22-4	80.00	
		TOTALS:	100.000	341.000	1,000,000		Epoxy Resin	Trade secret	20.00	
	0.341 g To	tal Mass						Total	100.00	
	o comply with Lo Directive 2002/30/1	EC (RoHS Directive), EU Directive 2011/65/EU (RoHS	S Recast Direc	ctive) and witl	h EU Directive	19.51	(mg) Total	Chip (Die)	% of Total Weight	5.72
2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this	d via internal design controls, supp chemical substance is NOT an inten document, there is no credible reas	lier declarations, and /or analytical test data.	to the best of	f Microchip Te	chnology	19.51	(mg) Total Doped Silicon	Chip (Die) 7440-21-3 Total	100	5.72
002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the acorporated's knowledge and belief as of the date of this of below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 Vi	d via internal design controls, supp chemical substance is NOT an inten document, there is no credible reas ulatory scheme world-wide.	lier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen	to the best of tration of the	f Microchip Te chemical sub	chnology	19.51	1	7440-21-3	100	0.97
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the noorporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 VI thtp://ul.com/global/eng/pages/offerings/industries/chemithe protective "tubes" in which the specific product is sheer trief.	d via internal design controls, suppo chemical substance is NOT an inten document, there is no credible reas ulatory scheme world-wide. Iflammability standard for plastics. cals/plastics/	lier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen You can access the UL iQTM family of databases to	to the best of tration of the obtain a test	f Microchip Te chemical sub t report at	chnology stance, if any, is		Doped Silicon	7440-21-3 Total	100	
2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verifie f a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this lot below the threshold of regulatory concern for any regional modeling compounds used by Microchip meet the UL94 Vt. http://lul.com/global/eng/pages/offerings/industries/chemithe protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective "tubes" in which the specific product is should be a support of the protective the protective "tubes" in which the specific product is should be a support of the protective the protective "tubes" in which the specific product is should be a support of the protective	d via internal design controls, suppo- chemical substance is NOT an inten document, there is no credible reas ulatory scheme world-wide. If lammability standard for plastics. cals/plastics/ ipped are made from polyvinyl chlor ion in this form concerning substan- test of its knowledge and belief, as of the been compiled based on the re- crets and some information may no parts and the average weight of an	lier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen You can access the UL iQTM family of databases to ride (PVC) plastic. "Window envelopes" used to ho ces restricted by RoHS in Microchip Technology In fithe date listed in this form. Microchip Technology anges provided in Material Safety Data Sheets prov thave been provided by subcontract assemblers a cicipated significant toxic metals components. These	to the best of tration of the obtain a test Id the packing corporated's y Incorporate ided by raw m nd raw materi	f Microchip Te chemical sub t report at g slip on the o semiconducte d cannot guar naterial suppli ial suppliers. I	stance, if any, is outer box and or devices in antee the ers. Supplier information is		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verifief a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any reg folding compounds used by Microchip meet the UL94 VI http://ul.com/global/eng/pages/offerings/industries/chemine protective "tubes" in which the specific product is sheertain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the informat heir original packing materials is true and correct to the leading to the senting of the sent of the servage weight of these forovided only as estimates of the average weight of these lopants, metals, and non-metal materials contained within Alicrochip Technology Incorporated does not provide any varranties provided by Microchip Technology Incorporate uputations, sales order acknowledgement, and invoices.	d via internal design controls, supportermical substance is NOT an intendocument, there is no credible reasulatory scheme world-wide. If lammability standard for plastics. cals/plastics/ ipped are made from polyvinyl chlorities of its knowledge and belief, as of thas been compiled based on the recrets and some information may no parts and the average weight of and in silicon devices (silicon IC) in the firmarranty, express or implied, with red and its subsidiaries are contained.	tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concent of the control of the c	to the best of tration of the obtain a test obtain a test of the packing corporated's y incorporated by raw mad raw materise estimates of the corporate on. The exclusion ale. These are	f Microchip Te chemical subtreport at g slip on the o semiconduct d cannot guarnaterial suppliers. I do not include isive, limited pe provided in l	stance, if any, is nuter box and or devices in antee the ers. Supplier information is trace levels of product Microchip's		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.97
2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verifief a chemical substance is absent from the list above, the noorporated's knowledge and belief as of the date of this not below the threshold of regulatory concern for any reg Molding compounds used by Microchip meet the UL94 VI http://ul.com/global/eng/pages/offerings/industries/cheming the protective "tubes" in which the specific product is sherertain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the informat heir original packing materials is true and correct to the I completeness and accuracy of data in this form because information is often protected from disclosure as trade servovided only as estimates of the average weight of these lopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any varranties provided by Microchip Technology Incorporated process.	d via internal design controls, supportermical substance is NOT an intendocument, there is no credible reasulatory scheme world-wide. If lammability standard for plastics. cals/plastics/ ipped are made from polyvinyl chlorion in this form concerning substantest of its knowledge and belief, as of thas been compiled based on the recrets and some information may no parts and the average weight of anin silicon devices (silicon IC) in the firm warranty, express or implied, with red and its subsidiaries are contained or changes to Material Content Declar	lier declarations, and /or analytical test data. tional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concen You can access the UL iQTM family of databases to ride (PVC) plastic. "Window envelopes" used to ho one of the date listed in this form. Microchip Technology in the date listed in this form. Microchip Technology inges provided in Material Safety Data Sheets prov thave been provided by subcontract assemblers a cicipated significant toxic metals components. The inished parts. espect to the information provided in this declaration in Microchip's standard terms and conditions of surface.	to the best of tration of the obtain a test obtain a test of the packing corporated's y Incorporated ded by raw mader aw materise estimates con. The exclusion. The exclusion ale. These are	f Microchip Te chemical sub treport at g slip on the o semiconduct d cannot guar naterial supplial suppliers. Ido not include usive, limited p e provided in lt, consequent	schnology stance, if any, is outer box and or devices in rantee the ers. Supplier information is trace levels of oroduct Microchip's	3.31	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	100 100.00 % of Total Weight 100 100.00	0.97

NQ 72 VQFN 11:06 AM : 8/29/2013

Solid Substance	MICROCHIP				ation Base A per Alloy (C			Package Homo	geneous Materials		JEDEC 97 Product Marking and/or Pkg. Labeling
Saic Substance	Semiconductor Device Typ	e: AKZE 72 V	QFN 10x10x0.9 (NU)								e3
Episor Result Not Intronsis Totals Secret Most Compound 3.047 10.389 30.4861 Previous Not	Basic Substance	CAS Number			mg/part	ppm	180.05	(mg) Total	Mold Compound	% ot Total Weight	52.8
Principle Report (Prio BF (C. SECO), No disasterron protected Trispa Secont Most Compound 2-248 8-888 24-927 Carbon Black Trispa Second Most Compound 0-107 0-248 1-1273 Carbon Black Trispa Second Tris	Silica, vitreous	60676-86-0	Mold Compound	47.124	160.693	471,240		Silica, vitreous	60676-86-0	89.25	
Cabon Black	Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret		3.047	10.389	30,466		Epoxy Resin	Trade Secret	5.77	
Copper								Phenolic Resin			
Silver 1740-92-4 Lead Frame 0.28 2.78 196.29 (mol Total Weight 38.19 196.29 (mol Total 18.18 19.27 19.29 19.29 (mol Total 18.18 19.29 19.2								Carbon Black			
Silver 7440-22-4 Load Frame 0.728 2.451 7.725 Copee 7440-00-8 595-4											
Zinc 7440-96-6 Least Frame 0.048 0.163 477 575 200							130.23				38.19
Photophocous 7723-14-0 Leas Frame 0.033 0.107 315 Silver 7440;22-4 191 201 201 201 201 201 201 201 201 201 20								Copper	7440-50-8		
Silver Proposed Propo											
Epoxy Reain Trade secret Die Attach 0.080 0.273 800 Trade Secret Die											
Dilbert Trade secret Die Attach Cut-off Die Attach Die A											
Hardsner Trade secret Die Attach Q.49 Q.136 400 2.73 (mg) Total Die Attach New York Process Pr								Phosphorous			
Silicon 7440-21-3 Chip (Die) 19.505 57.200 Silicon 7440-51-8 Write Bond palladium coated copper (CuPd) 0.941 3.208 9.409 50.907 19.505 19.5											
Copper 7440-56-8 Wire Bond palladium coated copper (CuP3) 0.941 3.208 9,409							2.73				0.8
Palledum 7440-05-3 Wire Bond palledum cooper (CuPd) 0.029 0.089 291 1.500 1.500 1.513 15.200 1.500 1.513 15.200 1.500 1.513 15.200 1.500 1.513 15.200 1.500 1.513 15.200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.513 1.5200 1.500 1.500 1.500 1.500 1.500 1.513 1.5200 1.500 1.500 1.500 1.500 1.500 1.500 1.500 1.513 1.5200 1.500											
Time											
O.3410 g Total Mass S semiconductor device and its homogenous materials comply with EU Directive? O.3410 g Total Mass S semiconductor device and its homogenous materials comply with EU Directive? October 1253EC (End-Ot-Life Vehicles (EU) Directive). Doped Silicon Total (mg) Total Weight Total (mg) Doped Silicon Total T											
0.3410 g Total Mass is semiconductor device and its homogenous materials comply with EU Directivey, EU Directivey, EU Directivey, EU Directivey 2011/65/EU (RoHS Recast Directive) and with EU Directive 2025/EC (End-of-Life Vehicles (ELV) Directives). Impliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In termical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, not believe the threshold of regulatory concern for any regulatory scheme world-wide. In the complex of t	lin	7440-31-5						Hardener		5	
as semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with euch Euclive 2011/65/EU (RoHS Recast Directive) and with euclided and 100.00 (Publicative) and and 100.00 (Publicative) and 100.00 (Publicative) and 100.00 (Publicative) and 100.00 (Publicative) and				100.000	341.000	1,000,000					
### Dispect Silicon ### Di		0.3410	g Total Mass				19.51	Total (mg)	Chip (Die)	% of Total Weight	5.72
proporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, of total weight coper (CuPd) ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at to vi/ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ain "reels" may be made from PVC plastic. Total Total Total Total Total Total 100.00 Total	npliance with the above EU Directives has been verified via in	ternal design contro	ls, supplier declarations, and /or analytical test data.				,		Total	100.00	
tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ eprotective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ratain "reels" may be made from PVC plastic. Total 100.00 Palladium 7440-05-3 3 Total 100.00 Total 100.00 Palladium 7440-05-3 3 Total 100.00 Palladium 7440-05-3 3 Total 100.00 Total 100.00 Palladium 7440-05-3 3 Total 100.00 Total 1	corporated's knowledge and belief as of the date of this docum	ent, there is no credi	ible reason to believe that the unavoidable impurity concent				3.31	(mg) Total	palladium coated	% of Total Weight	0.97
tain "reels" may be made from PVC plastic. Total 100.00		ability standard for p				-			copper (Curu)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
irroring Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in irroring and accuracy of data in this form because it has been complied based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier ormation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is voiced only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. **Crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product rranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtains, sales order acknowledgement, and invoices. **Solution** In Plating on external leads (pins) - Matter Tin / annealed at 150°C for 1 / hour / ho	p://ul.com/global/eng/pages/offerings/industries/chemicals/pla	stics/	plastics. You can access the UL iQTM family of databases to	obtain a test r	eport at			Copper	11 1 1		
crochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product interpretation in the exclusive interpretation in the exclusive, limited product in the exclusive, limited produ	e protective "tubes" in which the specific product is shipped a		·		•	ter box and			7440-50-8 7440-05-3	97	
nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third party test reports (e protective "tubes" in which the specific product is shipped a tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in the program of the protected from disclosure as trade secrets a portion of one of the protected from disclosure as trade secrets a portion of the protected from disclosure as trade secrets and produced only as estimates of the average weight of these parts as the protected from the program of the program of the program of the protected from the program of the program of the program of the protected from the protected from the program of the program of the protected from the protected fro	re made from polyvinis form concerning ts knowledge and been compiled based and some information and the average weig	nyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Inclief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers ar ht of anticipated significant toxic metals components. Thes	d the packing s corporated's se y Incorporated ded by raw ma nd raw materia	slip on the ou emiconductor cannot guara terial supplie I suppliers. In	devices in ntee the rs. Supplier formation is			7440-50-8 7440-05-3	97	
Total 400.00	e protective "tubes" in which the specific product is shipped a rtain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in the profiginal packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets an ovided only as estimates of the average weight of these parts a dopants, metals, and non-metal materials contained within silicrochip Technology Incorporated does not provide any warran trranties provided by Microchip Technology Incorporated and i	re made from polyvinis form concerning ts knowledge and been compiled based of some information and the average weig con devices (siliconty, express or implie	nyl chloride (PVC) plastic. "Window envelopes" used to hole substances restricted by RoHS in Microchip Technology Incilief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are the of anticipated significant toxic metals components. Thes IC) in the finished parts. d, with respect to the information provided in this declaration.	d the packing s corporated's so Incorporated ded by raw ma nd raw materia se estimates do on. The exclusi	emiconductor cannot guara terial supplie I suppliers. In not include t	devices in ntee the rs. Supplier formation is race levels	5.18	Palladium	7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	97 3 100.00	1.52
	e protective "tubes" in which the specific product is shipped a tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of inpleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets any ideal only as estimates of the average weight of these parts a dopants, metals, and non-metal materials contained within silicorochip Technology Incorporated does not provide any warran rranties provided by Microchip Technology Incorporated and in totations, sales order acknowledgement, and invoices. Crochip disclaims any duty to notify users of updates or changerwise, suffered by users or third parties as a result of the user.	re made from polyvi nis form concerning ts knowledge and be sen compiled based of d some information and the average weig con devices (silicon ty, express or implie ts subsidiaries are concess to Material Conte	nyl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Incilief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are ht of anticipated significant toxic metals components. Thes IC) in the finished parts. d, with respect to the information provided in this declaration ontained in Microchip's standard terms and conditions of so	d the packing storporated's set incorporated died by raw mand raw materiate estimates do on. The exclusiale. These are pact or indirect,	emiconductor cannot guara terial supplie suppliers. In not include t ve, limited pr provided in M	devices in ntee the rs. Supplier formation is race levels oduct icrochip's	5.18	Palladium (mg) Total	7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	97 3 100.00 % of Total Weight	1.52
	e protective "tubes" in which the specific product is shipped a rtain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in the program of the program of the program of the program of the best of its mpleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets at a covided only as estimates of the average weight of these parts a dopants, metals, and non-metal materials contained within silic crochip Technology Incorporated does not provide any warran urranties provided by Microchip Technology Incorporated and it otations, sales order acknowledgement, and invoices. crochip disclaims any duty to notify users of updates or changererwise, suffered by users or third parties as a result of the use	re made from polyvi nis form concerning ts knowledge and be sen compiled based of d some information and the average weig con devices (silicon ty, express or implie ts subsidiaries are concess to Material Conte	nyl chloride (PVC) plastic. "Window envelopes" used to hol substances restricted by RoHS in Microchip Technology Incilief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers are ht of anticipated significant toxic metals components. Thes IC) in the finished parts. d, with respect to the information provided in this declaration ontained in Microchip's standard terms and conditions of so	d the packing storporated's set incorporated died by raw mand raw materiate estimates do on. The exclusiale. These are pact or indirect,	emiconductor cannot guara terial supplie suppliers. In not include t ve, limited pr provided in M	devices in ntee the rs. Supplier formation is race levels oduct icrochip's	5.18	Palladium (mg) Total	7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	97 3 100.00 % of Total Weight	1.52

AKZE 11:06 AM : 8/29/2013

Halogen-Free

Semiconductor Device	Type: QCF 16 (Lead)	WQFN 3x3x0.75mm (30)		nation Base A pper Alloy (C				ogeneous Materials: .g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e4
	10 (2000)	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	10.05	(mg) Total	Mold Compound	% ot Total Weight	45.91
Silica, vitreous (or fused)	60676-86-0	Mold Compound	39.024	8.546	390,235		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	3.994	0.875	39,942		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	2.755	0.603	27,546		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.138	0.030	1,377		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	48.494	10.620	484,943			Total	100.00	
Iron	7439-89-6	Lead Frame	1.146	0.251	11,463	10.91	(mg) Total	Lead Frame	% of Total Weight	49.84
Phosphorous	7723-14-0	Lead Frame	0.125	0.027	1,246		Copper	7440-50-8	97.30	
Zinc (Metal)	7440-44-0	Lead Frame	0.075	0.016	748		Iron	7439-89-6	2.30	
Silver	7440-22-4	Die Attach	1.529	0.335	15,288		Phosphorous	7723-14-0	0.25	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.353	0.077	3,528		Zinc (Metal)	7440-44-0	0.15	
Treated silica	Trade Secret	Die Attach	0.039	0.009	392			Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.039	0.009	392	0.43	(mg) Total	Die Attach	% of Total Weight	1.96
Gallium arsenide	1300-00-00	Chip (Die)	1.550	0.339	15,500		Silver	7440-22-4	78	
Gold	7440-57-5	Wire Bond	0.460	0.101	4,600		Acrylate resins Proprietary	Trade Secret	18	
Nickel	7440-02-0	Plating on external leads (pins)	0.265	0.058	2,646		Treated silica	Trade Secret	2	
Palladium	7440-05-03	Plating on external leads (pins)	0.014	0.003	140	Hetei	ocyclic organic compound	Trade Secret	2	
Gold	7440-57-5	Plating on external leads (pins)	0.001	0.000	14			Total	100.00	
			-	21.900 Directive) and v	1,000,000 vith EU	0.34	Total (mg) Doped GaAs	Chip (Die) 1300-00-00 Total	% of Total Weight 100 100.00	1.55
semiconductor device and its homogenous materials titve 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verified homical substance is absent from the list above, the commission of	comply with EU Directive 2002 I via internal design controls,	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/t supplier declarations, and /or analytical test dat	:U (RoHS Recast D	Directive) and v	vith EU	0.10		1300-00-00	100	0.46
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive; pliance with the above EU Directives has been verifier hemical substance is absent from the list above, the operated's knowledge and belief as of the date of this	comply with EU Directive 2002 I via internal design controls, hemical substance is NOT an document, there is no credible	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/b supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor develores to believe that the unavoidable impurity	EU (RoHS Recast Date of the control	Directive) and v	vith EU Technology		Doped GaAs	1300-00-00 Total	100 100.00	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive; bliance with the above EU Directives has been verified hemical substance is absent from the list above, the operated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ling compounds used by Microchip meet the UL94 VO	comply with EU Directive 2002 I via internal design controls, hemical substance is NOT an document, there is no credible ny regulatory scheme world-witlammability standard for plass	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/t/ supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor develore reason to believe that the unavoidable impurity ide.	EU (RoHS Recast Date of the Design of Concentration of	Directive) and v	vith EU Technology		Doped GaAs (mg) Total	1300-00-00 Total Wire Bond	100 100.00 % of Total Weight	
etive 2002/53/EC (End-of-Life Vehicles (ELV) Directive; pliance with the above EU Directives has been verified themical substance is absent from the list above, the operated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a sing compounds used by Microchip meet the UL94 VO (/ul.com/global/eng/pages/offerings/industries/chemicorotective "tubes" in which the specific product is shi	comply with EU Directive 2002. I via internal design controls, hemical substance is NOT an document, there is no credible by regulatory scheme world-wilammability standard for plassals/plastics/	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/t/ supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor develores reason to believe that the unavoidable impurity ride.	EU (RoHS Recast D a. ice and, to the best concentration of pases to obtain a t	Directive) and vest of Microchip the chemical s	vith EU Technology ubstance, if		Doped GaAs (mg) Total	1300-00-00 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive	comply with EU Directive 2002 I via internal design controls, themical substance is NOT and document, there is no credibly regulatory scheme world-willammability standard for plast als/plastics/ opped are made from polyvinylop in in this form concerning subset of its knowledge and be seit has been compiled based trade secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets and some informelight of these parts and the average secrets.	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65// supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor dev e reason to believe that the unavoidable impurity ide. tics. You can access the UL iQTM family of data chloride (PVC) plastic. "Window envelopes" use ostances restricted by RoHS in Microchip Techn lief, as of the date listed in this form. Microchip I on the ranges provided in Material Safety Data mation may not have been provided by subcontr verage weight of anticipated significant toxic me	a. ice and, to the best concentration of bases to obtain a test to hold the pack to longy incorporated fechnology incorporated fechnology incorporated act assemblers and assemblers and act act assemblers and act act assemblers and act	oirective) and v st of Microchip the chemical s test report at king slip on the d's semicondu oorated cannot vy raw material d raw material	Technology ubstance, if e outer box ctor devices guarantee suppliers. suppliers.	0.10	Opped GaAs (mg) Total Doped Gold	1300-00-00 Total Wire Bond 7440-57-5 Total Plating on external	100 100.00 % of Total Weight 100	0.46
etive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verified hemical substance is absent from the list above, the comporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a sing compounds used by Microchip meet the UL94 VO //ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shipper the control of t	comply with EU Directive 2002 I via internal design controls, hemical substance is NOT an locument, there is no credible yr regulatory scheme world-will ammability standard for plast als/plastics/poped are made from polyvinyl on in this form concerning subbest of its knowledge and bese it has been compiled based trade secrets and some informight of these parts and the averials contained within silicon warranty, express or implied, value in the subsidiaries are continuous.	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65// supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor dev e reason to believe that the unavoidable impurity ide. tics. You can access the UL iQTM family of data chloride (PVC) plastic. "Window envelopes" use ostances restricted by RoHS in Microchip Techn lief, as of the date listed in this form. Microchip I on the ranges provided in Material Safety Data mation may not have been provided by subcontra verage weight of anticipated significant toxic me devices (silicon IC) in the finished parts. with respect to the information provided in this of	EU (ROHS Recast Date of the best of concentration of the bases to obtain a total to hold the pacific ology Incorporated Fechnology Incorporated Fechnology Incorporated Technology Incorporated Techno	or of Microchip the chemical states the chemical states are port at the chemical states are the chemic	Technology ubstance, if e outer box ctor devices guarantee suppliers. es do not d product	0.10	Doped GaAs (mg) Total Doped Gold (mg) Total	1300-00-00 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.46
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive, liance with the above EU Directives has been verified the incomplete of the date of this is not below the threshold of regulatory concern for any compounds used by Microchip meet the UL94 V0 ul.com/global/eng/pages/offerings/industries/chemic rotective "tubes" in which the specific product is shiertain "reels" may be made from PVC plastic. The product of the informatic roriginal packing materials is true and correct to the impleteness and accuracy of data in this form because ir information is often protected from disclosure as aution is provided only as estimates of the average we trace levels of dopants, metals, and non-metal matchip Technology Incorporated does not provide any this provided only activated ones not provide any this provided by Microchip Technology Incorporated the provided provides any this provided by Microchip Technology Incorporated corporated the provided only active provided any this provided by Microchip Technology Incorporate	comply with EU Directive 2002 I via internal design controls, themical substance is NOT an document, there is no credible to regulatory scheme world-weilammability standard for plast als/plastics/ oped are made from polyvinyl on in this form concerning substance of its knowledge and be set that best of its knowledge and be the standard secrets and some informing the set of the secrets and the average scheme warrand, express or implied, and the substance on the informatics. Changes to Material Content I he users' reliance on the informatics.	otal Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/E supplier declarations, and /or analytical test dat intentional ingredient in the semiconductor developes ride. tics. You can access the UL iQTM family of data chloride (PVC) plastic. "Window envelopes" use estances restricted by RoHS in Microchip Techn lief, as of the date listed in this form. Microchip I on the ranges provided in Material Safety Data name of the date listed in this form will concern verage weight of anticipated significant toxic me devices (silicon IC) in the finished parts. with respect to the information provided in this of anined in Microchip's standard terms and condit	EU (RoHS Recast E a. ice and, to the bes concentration of bases to obtain a t and to hold the pack bloogy Incorporated Fechnology Incorporated Fechnol	st of Microchip the chemical s est report at king slip on the d's semicondu prave material d'raw material d'raw material These estimate colusive, limitee e are provided	rith EU Technology ubstance, if outer box ctor devices guarantee suppliers. suppliers. ses do not d product in	0.10	(mg) Total Doped Gold (mg) Total Nickel	1300-00-00 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100 100.00 % of Total Weight 100 100.00 % of Total Weight 94.50	0.46

QCF 16 WQFN 11:06 AM : 8/29/2013

ICROCHIP Semiconductor Device	a Type: ODE 24/102	n) WQFN 4x4x0.75 mm (QW)		nination Base Copper Alloy				eneous Materials: . pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device	e Type. QDL 24 (Lead	"Contained In"	% Total	Ī			1	1		
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	17.88	(mg) Total	Mold Compound	% ot Total Weight	45.6
Silica, fused	60676-86-0	Mold Compound	41.040	16.088	410,400		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.212	0.867	22,116	Ep	oxy Resin (NLP # 500-033-5)	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.212	0.867	22,116		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.137	0.054	1,368		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	47.559	18.643	475,586			Total		
Iron	7439-89-6	Lead Frame	1.170	0.459	11,698	19.51	(mg) Total	Lead Frame	% of Total Weight	49.78
Silver	7440-22-4	Lead Frame	0.948	0.372	9,483		Copper	7440-50-8	95.54	
Zinc Phosphorous	7440-66-6 7723-14-0	Lead Frame Lead Frame	0.062	0.024 0.016	622 411		Iron Silver	7439-89-6 7440-22-4	2.35 1.91	
Silver	7440-22-4	Die Attach	0.858	0.336	8.580		Zinc	7440-22-4	0.13	
Acrylate resins Proprietary	Trade Secret	Die Attach	0.038	0.078	1,980		Phosphorous	7723-14-0	0.08	
Treated silica	Trade Secret	Die Attach	0.022	0.009	220		Thospholods	Total	100.00	
Heterocyclic organic compound	Trade Secret	Die Attach	0.022	0.009	220	0.43	(mg) Total	Die Attach	% of Total Weight	1.1
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	0.870	0.341	8,700	0.43	Silver	7440-22-4	78	
Doped Gold	7440-57-5	Wire Bond	0.380	0.149	3,800		Acrylate resins Proprietary	Trade Secret	18	
Tin		ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.270	0.890	22,700		Treated silica	Trade Secret	2	
		TOTALS:	100.000	39.200	1.000.000	He	eterocyclic organic compound	Trade Secret	2	
		IOTALS:	100.000							
	0.0392 g	Total Mass	100.000	03.200	,,,,,,,,,			Total	100.00	
emiconductor device and its homogenous materials c 53/EC (End-of-Life Vehicles (ELV) Directive).					,,	0.34	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	0.87
	omply with EU Directive 2002	Total Mass 95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS			,,			Chip (Die) 1303-00-0	% of Total Weight	0.87
i3/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified been ical substance is absent from the list above, the choorated's knowledge and belief as of the date of this dobelow the threshold of regulatory concern for any reg	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an in ocument, there is no credible ulatory scheme world-wide.	Total Mass /95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. ntentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentry	Recast Dire	ctive) and with f Microchip Te chemical sub	n EU Directive	0.34	(mg) Total Gallium arsenide (GaAs)	Chip (Die) 1303-00-0 Total	% of Total Weight 100 100.00	
53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified the list above, the characteristic substance is absent from the list above, the characteristic showledge and belief as of the date of this debelow the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 fluit.com/global/eng/pages/offerings/industries/chemical	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an i coument, there is no credible ulatory scheme world-wide. ammability standard for plast s/plastics/	Total Mass /95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentration. You can access the UL iQTM family of databases to	Recast Dire	ctive) and with f Microchip Te chemical sub t report at	chnology stance, if any,		(mg) Total	Chip (Die) 1303-00-0	% of Total Weight	0.87
53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified the list above, the characteristic substance is absent from the list above, the characteristic showledge and belief as of the date of this debelow the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 fluit.com/global/eng/pages/offerings/industries/chemical	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an i coument, there is no credible ulatory scheme world-wide. ammability standard for plast s/plastics/	Total Mass /95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. ntentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentry	Recast Dire	ctive) and with f Microchip Te chemical sub t report at	chnology stance, if any,	0.34	(mg) Total Gallium arsenide (GaAs)	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified ' Iliance with the above EU Directives has been verified ' Iliance with the above EU Directives has been verified ' Iliance with the above EU Directives has been verified ' Iliance with the date of this do Iliance with the date of this do Iliance with the should be a directive of any reg In g compounds used by Microchip meet the UL94 V0 fl. Ill.com/global/eng/pages/offerings/industries/chemical Interestive "tubes" in which the specific product is ship In "reels" may be made from PVC plastic. Ichip Technology Incorporated believes the information Interestive and correct to the best Illeteness and accuracy of data in this form because it h Interestive as trade secretary of the secretary of the secretary of the protected from disclosure as trade secretary.	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an in comment, there is no credible ulatory scheme world-wide. ammability standard for plast is/plastics/ ped are made from polyvinyl of the p	Total Mass 795/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hold stances restricted by RoHS in Microchip Technology Inc. as of the date listed in this form. Microchip Technology her ranges provided in Material Safety Data Sheets provide y not have been provided by subcontract assemblers and anticipated significant toxic metals components. These	Recast Dire o the best or ration of the obtain a test d the packin- orporated's Incorporate died by raw n d raw mater	f Microchip Te chemical sub treport at g slip on the o semiconducted cannot guar naterial supplifiers. I	chnology stance, if any, uter box and or devices in antee the ers. Supplier information is	0.34	(mg) Total Gallium arsenide (GaAs) (mg) Total	Chip (Die) 1303-00-0 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified the semical substance is absent from the list above, the characteristic substance is absent from the list above, the characteristic substance is absent from the list above, the characteristic substance is absent from the list above, the characteristic substance is absent from any reging compounds used by Microchip meet the UL94 V0 fit. In com/global/eng/pages/offerings/industries/chemical rotective "tubes" in which the specific product is shipp in "reels" may be made from PVC plastic. In Technology Incorporated believes the information rotiginal packing materials is true and correct to the bestetness and accuracy of data in this form because it hastion is often protected from disclosure as trade secreted only as estimates of the average weight of these puts, metals, and non-metal materials contained within schip Technology Incorporated does not provide any weight Technology Incorporated December 1991 Technology Incorporated Technology Incorporated Technology Incorporated Technology Incorpora	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an in comment, there is no credible ulatory scheme world-wide. ammability standard for plast is/plastics/ ped are made from polyvinyl of the	Total Mass 795/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hold stances restricted by RoHS in Microchip Technology Inc. as of the date listed in this form. Microchip Technology her ranges provided in Material Safety Data Sheets provide y not have been provided by subcontract assemblers and anticipated significant toxic metals components. These	Recast Dire o the best of ration of the obtain a test if the packing orporated's Incorporate led by raw in direct direct ray and a raw mater e estimates on. The exclusion.	f Microchip Te chemical sub treport at g slip on the o semiconducted cannot guaranterial supplied on the control of the contro	chnology stance, if any, uter box and or devices in antee the ers. Supplier information is trace levels of	0.34	(mg) Total Gallium arsenide (GaAs) (mg) Total Doped Gold	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
53/EC (End-of-Life Vehicles (ELV) Directive). bliance with the above EU Directives has been verified the semical substance is absent from the list above, the chorated's knowledge and belief as of the date of this debelow the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 flut.com/global/eng/pages/offerings/industries/chemical rotective "tubes" in which the specific product is shippin "reels" may be made from PVC plastic. The Technology Incorporated believes the information original packing materials is true and correct to the besteteness and accuracy of data in this form because it he lation is often protected from disclosure as trade secreted only as estimates of the average weight of these pats, metals, and non-metal materials contained within such provided by Microchip Technology Incorporated does not provide any within specific provided by Microchip Technology Incorporated tions, sales order acknowledgement, and invoices.	omply with EU Directive 2002 via internal design controls, s emical substance is NOT an in cument, there is no credible ulatory scheme world-wide. ammability standard for plast is/plastics/ bed are made from polyvinyl of in this form concerning sub- st of its knowledge and belief, is been compiled based on t ets and some information ma arts and the average weight o silicon devices (silicon IC) in t arrranty, express or implied, w and its subsidiaries are conta hanges to Material Content D	Total Mass 795/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentrations. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hold stances restricted by RoHS in Microchip Technology Inc. as of the date listed in this form. Microchip Technology her ranges provided in Material Safety Data Sheets provide y not have been provided by subcontract assemblers and fanticipated significant toxic metals components. These her finished parts.	Recast Dire o the best or ration of the obtain a test d the packin- orporated's Incorporate ded by raw in d raw mater e estimates of inc. The exclude. These are ct or indirect	f Microchip Te chemical sub t report at g slip on the o semiconducted cannot guar naterial suppliers. I do not include usive, limited p e provided in I t, consequentit,	chnology stance, if any, uter box and or devices in antee the ers. Supplier information is trace levels of devices of devices in an interest of the conduct will be deviced by the conduct	0.34	(mg) Total Gallium arsenide (GaAs) (mg) Total Doped Gold	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matter Tin / annealed at 150°C for 1	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.38

QDE WQFN 11:06 AM : 8/29/2013

MICROCHIP				mination Base Copper Alloy				ogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	ce Type: QXBE 12 (Lead	d) XQFN 2x2x0.45mm (QL)								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	6.10	(mg) Total	Mold Compound	% ot Total Weight	60.43
Silica, fused	60676-86-0	Mold Compound	54.387	5,493	543.870		Silica, fused	60676-86-0	90.00	
Epoxy Resin (NLP # 500-033-5)	Trade Secret	Mold Compound	2.931	0.296	29,309		Epoxy Resin	Trade Secret	4.85	1
Phenolic Resin	Trade Secret	Mold Compound	2.931	0.296	29,309		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.181	0.018	1,813		Carbon Black	1333-86-4	0.30]
Copper	7440-50-8	Lead Frame	34.039	3.438	340,391			Total	100.00	_
Nickel	7440-02-0	Lead Frame	0.908	0.092	9,078	3.61	(mg) Total	Lead Frame	% of Total Weight	35.74
Silicon	7440-21-3	Lead Frame	0.161	0.016	1.608		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.036	0.004	357		Nickel	7440-02-0	2.54	1
Silver	7440-22-4	Lead Frame	0.597	0.060	5,965		Silicon	7440-21-3	0.45	1
Silver	7440-22-4	Die Attach	0.904	0.091	9,040		Magnesium	7439-95-4	0.10	1
Epoxy Resin	Trade secret	Die Attach	0.226	0.023	2,260		Silver	7440-22-4	1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	1.230	0.124	12,300			Total	100.00	3
Gold	7440-57-5	Wire Bond	0.370	0.037	3,700	0.11	(mg) Total	Die Attach	% of Total Weight	1.13
Tin	7440-31-5 PI	ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.100	0.111	11.000		Silver	7440-22-4	80.00	
		TOTALS:	100.000	10.100	1,000,000		Epoxy Resin	Trade secret	20.00	1
	0.0101 ~	Total Mass			,,			Total	100.00	
02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified	via internal design controls, s	upplier declarations, and /or analytical test data.				0.12	(mg) Total Gallium arsenide (GaAs)		% of Total Weight	1.23
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this corporated.	hemical substance is NOT an in locument, there is no credible	ntentional ingredient in the semiconductor device and, t				0.12		,		1.23
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cicorporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any republicing compounds used by Microchip meet the UL94 V0 is	hemical substance is NOT an in locument, there is no credible gulatory scheme world-wide. Ilammability standard for plast	ntentional ingredient in the semiconductor device and, treason to believe that the unavoidable impurity concent	ration of the	chemical sub		0.12		1303-00-0	100.00	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cicorporated's knowledge and belief as of the date of this cont below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 VO 1; p://ul.com/global/eng/pages/offerings/industries/chemicale protective "tubes" in which the specific product is ship	hemical substance is NOT an in locument, there is no credible i gulatory scheme world-wide. flammability standard for plast als/plastics/	ntentional ingredient in the semiconductor device and, treason to believe that the unavoidable impurity concent ics. You can access the UL iQTM family of databases to	ration of the	chemical sub	stance, if any,		Gallium arsenide (GaAs)	1303-00-0 Total	100.00	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cicorporated's knowledge and belief as of the date of this cont below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 V0 to p!//ul.com/global/eng/pages/offerings/industries/chemicale protective "tubes" in which the specific product is shiptrain "reels" may be made from PVC plastic.	hemical substance is NOT an in locument, there is no credible in gulatory scheme world-wide. Ilammability standard for plast als/plastics/ oped are made from polyvinyl o	ntentional ingredient in the semiconductor device and, treason to believe that the unavoidable impurity concent ics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole	ration of the obtain a test	chemical sub t report at g slip on the o	stance, if any,		Gallium arsenide (GaAs)	1303-00-0 Total Wire Bond 7440-57-5	100.00 100.00 % of Total Weight	0.37
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cicorporated's knowledge and belief as of the date of this cont below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 VO 1; p://ul.com/global/eng/pages/offerings/industries/chemicale protective "tubes" in which the specific product is ship	hemical substance is NOT an in locument, there is no credible in gulatory scheme world-wide. lammability standard for plast als/plastics/ oped are made from polyvinyl of on in this form concerning sub- test of its knowledge and belief, has been compiled based on it rets and some information may parts and the average weight o	ntentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole stances restricted by RoHS in Microchip Technology Inc. as of the date listed in this form. Microchip Technology her ranges provided in Material Safety Data Sheets provi y not have been provided by subcontract assemblers are fanticipated significant toxic metals components. Thes	obtain a test d the packing corporated's Incorporate ded by raw m d raw mater	t report at g slip on the o semiconducto d cannot guar naterial supplicial suppliers. I	stance, if any, uter box and or devices in antee the ers. Supplier nformation is		Gallium arsenide (GaAs)	1303-00-0 Total Wire Bond	100.00 100.00 % of Total Weight	0.37
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the citorporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 V0 to p://ul.com/global/eng/pages/offerings/industries/chemicite protective "tubes" in which the specific product is ship retain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the informatical proriginal packing materials is true and correct to the beingleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade seconded only as estimates of the average weight of these provided only as estimates of the average weight of these	hemical substance is NOT an in locument, there is no credible in gulatory scheme world-wide. lammability standard for plast als/plastics/ oped are made from polyvinyl of on in this form concerning sub- test of its knowledge and belief, has been compiled based on it rets and some information may parts and the average weight o silicon devices (silicon IC) in it varranty, express or implied, w	ntentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole stances restricted by RoHS in Microchip Technology Inc. as of the date listed in this form. Microchip Technology her ranges provided in Material Safety Data Sheets provive in the provided by subcontract assemblers are fanticipated significant toxic metals components. Thes he finished parts.	obtain a test d the packing corporated's Incorporate ded by raw n d raw mater e estimates o	t report at g slip on the o semiconducto d cannot guar naterial supplicial suppliers. I do not include	uter box and or devices in antee the ers. Supplier nformation is trace levels of orduct		Gallium arsenide (GaAs)	1303-00-0 Total Wire Bond 7440-57-5	100.00 100.00 % of Total Weight	0.37
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the citorporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 V0 typ://ul.com/global/eng/pages/offerings/industries/chemicale protective "tubes" in which the specific product is ship ratain "reels" may be made from PVC plastic. Corochip Technology Incorporated believes the informatical provided any activation is often protected from disclosure as trade second only as estimates of the average weight of these pants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any verranties provided by Microchip Technology Incorporated	hemical substance is NOT an in locument, there is no credible gulatory scheme world-wide. Ilammability standard for plast als/plastics/ oped are made from polyvinyl of on in this form concerning sub- ist of its knowledge and belief, has been compiled based on ti- rets and some information ma- parts and the average weight o silicon devices (silicon IC) in to varranty, express or implied, we if and its subsidiaries are contal	Intentional ingredient in the semiconductor device and, treason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole stances restricted by RoHS in Microchip Technology Incas of the date listed in this form. Microchip Technology in an earney of the date listed in Material Safety Data Sheets provity not have been provided by subcontract assemblers are anticipated significant toxic metals components. Thes he finished parts. With respect to the information provided in this declaratic intending in Microchip's standard terms and conditions of secondard to the standard terms and conditions of secondard to the standard terms and conditions of secondard to the standard terms and conditions of secondard terms and shall not be liable for any damages, directions.	obtain a test d the packing corporated's Incorporate ded by raw in d raw mater e estimates o on. The exclu lie. These are ct or indirect	t report at g slip on the o semiconducto d cannot guar naterial supplirial supplirial suppliers. I do not include usive, limited p e provided in I t, consequenti	uter box and or devices in antee the ers. Supplier information is trace levels of violuct Microchip's al or otherwise,	0.04	Gallium arsenide (GaAs) (mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	100.00 100.00 % of Total Weight 100.00	0.37
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the citorporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any repolding compounds used by Microchip meet the UL94 Vol. pp://ul.com/global/eng/pages/offerings/industries/chemicite protective "tubes" in which the specific product is ship train "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informatical original packing materials is true and correct to the being pleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade seconded only as estimates of the average weight of these pants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any virranties provided by Microchip Technology incorporated otations, sales order acknowledgement, and invoices. crochip disclaims any duty to notify users of updates or flered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users or third parties as a result of the users' refered by users of the users' refered by users of the users' refered by user	hemical substance is NOT an in locument, there is no credible gulatory scheme world-wide. Ilammability standard for plast als/plastics/ oped are made from polyvinyl of on in this form concerning sub- ist of its knowledge and belief, has been compiled based on ti- rets and some information ma- parts and the average weight o silicon devices (silicon IC) in to varranty, express or implied, we if and its subsidiaries are contal	Intentional ingredient in the semiconductor device and, treason to believe that the unavoidable impurity concentrics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole stances restricted by RoHS in Microchip Technology Incas of the date listed in this form. Microchip Technology in an earney of the date listed in Material Safety Data Sheets provity not have been provided by subcontract assemblers are anticipated significant toxic metals components. Thes he finished parts. With respect to the information provided in this declaratic intending in Microchip's standard terms and conditions of secondard to the standard terms and conditions of secondard to the standard terms and conditions of secondard to the standard terms and conditions of secondard terms and shall not be liable for any damages, directions.	obtain a test d the packing corporated's Incorporate ded by raw in d raw mater e estimates o on. The exclu lie. These are ct or indirect	t report at g slip on the o semiconducto d cannot guar naterial supplirial supplirial suppliers. I do not include usive, limited p e provided in I t, consequenti	uter box and or devices in antee the ers. Supplier information is trace levels of violuct Microchip's al or otherwise,	0.04	Gallium arsenide (GaAs) (mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100.00 100.00 % of Total Weight 100.00 % of Total Weight	0.37

QXBE 12 XQFN 11:07 AM : 8/29/2013

MICROCHIP				nation Base pper Alloy (0	. ,			nogeneous Materials: e.g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Devi	ce Type: QXCE 16 (Lead) XQ									e3
Paris Outstance	040 November	"Contained In" Sub-Component	% Total			7.94	(mg) Total	Mold Compound	% ot Total Weight	44.83
Basic Substance Silica, fused	CAS Number 60676-86-0	Mold Compound	Weight 40.347	mg/part 7.149	ppm		Silica, fused	60676-86-0	90.00	1
Epoxy Resin	Trade Secret	Mold Compound	2.174	0.385	403,470 21,743		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.174	0.385	21,743		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.134	0.024	1,345		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	45,544	8.070	455,442			Total		u .
Nickel	7440-02-0	Lead Frame	1.215	0.215	12,146	8.47	(mg) Total	Lead Frame	% of Total Weight	47.82
Silicon	7440-21-3	Lead Frame	0.215	0.038	2,152		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.048	0.008	478		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.798	0.141	7,981		Silicon	7440-21-3	0.45	
Silver	7440-22-4	Die Attach	0.728	0.129	7,280		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade secret	Die Attach	0.182	0.032	1,820		Silver	7440-22-4	1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	2.490	0.441	24,900			Total		
Doped Gold	7440-57-5	Wire Bond	0.560	0.099	5,600	0.16	(mg) Total	Die Attach	% of Total Weight	0.91
Tin	7440-31-5 Plating or	n external leads (pins) - Matte Tin / annealed at 150°C for 1 hour TOTALS:	3.390 100.000	0.601 17.720	33,900 1.000.000		Silver	7440-22-4	80.00 20.00	
			100.000	17.720	1,000,000		Epoxy Resin	Trade secret Total		<u>l</u>
	0.0177 g Tota	al Mass						i otai	100.00	
his semiconductor device and its homogenous materials		C (RoHS Directive), EU Directive 2011/65/EU (RoHS	S Recast Dire	ective) and wi	th EU	0.44	(mg) Total	Chip (Die)	% of Total Weight	2.49
pirective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	, , , , , , , , , , , , , , , , , , , ,	S Recast Dire	ective) and wi	th EU	0.44				2.49
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified). d via internal design controls, supplie	er declarations, and /or analytical test data.		,	•	0.44	(mg) Total Gallium arsenide	1303-00-0	100	2.49
pirective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso	er declarations, and /or analytical test data.	to the best o	f Microchip T	echnology	0.44			100	2.49
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the incorporated's knowledge and belief as of the date of this). d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso uny regulatory scheme world-wide. flammability standard for plastics. Yo	er declarations, and /or analytical test data. Ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concen	to the best o	f Microchip T chemical sul	echnology	0.44		1303-00-0	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the acorporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a folding compounds used by Microchip meet the UL94 VO	o). d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso any regulatory scheme world-wide. flammability standard for plastics. Yould splastics.	er declarations, and /or analytical test data. Ional ingredient in the semiconductor device and, In to believe that the unavoidable impurity concenuous can access the UL iQTM family of databases to	to the best o stration of the	f Microchip T chemical sul t report at	echnology ostance, if		Gallium arsenide	1303-00-0 Total	100	
birective 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the accorporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a foldling compounds used by Microchip meet the UL94 V0 ttp://ul.com/global/eng/pages/offerings/industries/chemic the protective "tubes" in which the specific product is sh	o). d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso any regulatory scheme world-wide. flammability standard for plastics. Yould splastics.	er declarations, and /or analytical test data. Ional ingredient in the semiconductor device and, In to believe that the unavoidable impurity concenuous can access the UL iQTM family of databases to	to the best o stration of the	f Microchip T chemical sul t report at	echnology ostance, if		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
birective 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the accorporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a foldling compounds used by Microchip meet the UL94 V0 ttp://ul.com/global/eng/pages/offerings/industries/chemic the protective "tubes" in which the specific product is sh	d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso uny regulatory scheme world-wide. flammability standard for plastics. Yeals/plastics/ ipped are made from polyvinyl chloric on in this form concerning substance best of its knowledge and belief, as se it has been compiled based on the trade secrets and some information veight of these parts and the average	er declarations, and /or analytical test data. ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concent ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to hold as restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technology aranges provided in Material Safety Data Sheets promay not have been provided by subcontract asse weight of anticipated significant toxic metals con	to the best o tration of the o obtain a test ld the packing corporated's ogy Incorpor- provided by re- emblers and r	f Microchip T chemical sul t report at g slip on the d semiconduct ated cannot g aw material s aw material s	echnology bstance, if outer box or devices juarantee juppliers.		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
prective 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the accorporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a folding compounds used by Microchip meet the UL94 VO ttp://ul.com/global/eng/pages/offerings/industries/chemic the protective "tubes" in which the specific product is shind certain "reels" may be made from PVC plastic. Iticrochip Technology Incorporated believes the information their original packing materials is true and correct to the completeness and accuracy of data in this form becausupplier information is often protected from disclosure as information is provided only as estimates of the average vertices.	d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reaso iny regulatory scheme world-wide. flammability standard for plastics. Yo als/plastics/ ipped are made from polyvinyl chlorid on in this form concerning substance be best of its knowledge and belief, as se it has been compiled based on the trade secrets and some information veight of these parts and the average terials contained within silicon device warranty, express or implied, with red and its subsidiaries are contained if	er declarations, and /or analytical test data. Ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concent ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to hold as restricted by RoHS in Microchip Technology Info the date listed in this form. Microchip Technology are anges provided in Material Safety Data Sheets provided in Material Safety Data Sheets weight of anticipated significant toxic metals cones (silicon IC) in the finished parts. Spect to the information provided in this declaration.	to the best of tration of the or obtain a test of the packing corporated's ogy Incorporated by a remblers and reponents. The control of the c	f Microchip T chemical sul t report at g slip on the of semiconduct ated cannot g aw material s ese estimates	pouter box or devices juarantee uppliers. s do not product		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.56
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive compliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the accorporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a lolding compounds used by Microchip meet the UL94 VO ttp://ul.com/global/eng/pages/offerings/industries/chemic he protective "tubes" in which the specific product is shand certain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information their original packing materials is true and correct to the ecompleteness and accuracy of data in this form becau upplier information is often protected from disclosure as information is provided only as estimates of the average vacuate trace levels of dopants, metals, and non-metal mallicrochip Technology Incorporated does not provide any varranties provided by Microchip Technology Incorporated	d via internal design controls, supplie chemical substance is NOT an intenti document, there is no credible reasony regulatory scheme world-wide. If ammability standard for plastics. Yeals/plastics/ ipped are made from polyvinyl chlorid on in this form concerning substance a best of its knowledge and belief, as see it has been compiled based on the trade secrets and some information veight of these parts and the average terrials contained within silicon device warranty, express or implied, with red d and its subsidiaries are contained if d invoices.	er declarations, and /or analytical test data. It is a light of the semiconductor device and, in to believe that the unavoidable impurity concent ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to hole as restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technology and the date listed in Material Safety Data Sheets provided in Material Safety Data Sheets provided by subcontract asse weight of anticipated significant toxic metals cones (silicon IC) in the finished parts. Spect to the information provided in this declaration Microchip's standard terms and conditions of suttions and shall not be liable for any damages, directions and shall not be liable for any damages.	to the best of tration of the poblain a test of the packing corporated's ogy Incorporated by remblers and reponents. The control on the excitable. These are ect or indirect of the poblain of the poblai	f Microchip T chemical sult report at g slip on the semiconduct ated cannot g aw material s aw material s ese estimate: usive, limited e provided in t, consequen	outer box or devices puarantee uppliers. s do not product	0.10	Gallium arsenide (mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.56

QXCE 16 XQFN 11:07 AM: 8/29/2013

Semiconductor Device Typ	e: QR 16 (Lead) QS(OP (H5)		nation Base A pper Alloy (C	. ,			nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
· · · · · · · · · · · · · · · · · · ·		"Contained In"	% Total			48.50	(mg) Total	Mold Compound	% ot Total Weight	58
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	-10.00	, 0,	·	·	ī———
Silica, vitreous	60676-86-0	Mold Compound	49.300	41.225	493,000		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.553 3.553	2.971 2.971	35,525		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	1.421	1.188	35,525 14,210		Phenolic Resin	Trade Secret	6.13 2.45	
Epoxy, Cresol Novolac Carbon Black	29690-82-2 1333-86-4	Mold Compound Mold Compound	0.174	0.145	1,740		Epoxy, Cresol Novolac Carbon Black	29690-82-2 1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	35.893	30.014	358,934	l	Carbon Black	1333-86-4 Total	100.00	<u>I</u>
Iron	7439-89-6	Lead Frame	0.883	0.738	8,829	24.42	() T-4-1			
						31.42	(mg) Total	Lead Frame	% of Total Weight	37.57
Silver	7440-22-4	Lead Frame	0.716	0.598	7,157		Copper	7440-50-8	95.54	
Zinc Phosphorous	7440-66-6 7723-14-0	Lead Frame Lead Frame	0.047	0.039 0.026	470 310		Iron Silver	7439-89-6 7440-22-4	2.35 1.91	
Silver	7440-22-4	Die Attach	0.031	0.026	2,220		Zinc	7440-22-4	0.13	
Epoxy resin	Trade Secret	Die Attach	0.222	0.050	600		Phosphorous	7723-14-0	0.13	
Metal oxide	Trade Secret	Die Attach	0.000	0.008	90		Filospilorous	7723-14-0 Total	100.00	l
	96-48-0	Die Attach	0.009	0.008	90	0.25	() T .(.)			0.3
Gamma-butyrolactone						0.25	(mg) Total	Die Attach	% of Total Weight	0.3
Silicon	7440-21-3	Chip (Die)	1.760 0.600	1.472 0.502	17,600		Silver	7440-22-4	74	
Gold Tin	7440-57-5 7440-31-5 Plating	Wire Bond	1.770	1.480	6,000 17,700		Epoxy resin Metal oxide	Trade Secret Trade Secret	20	
IIII	7440-31-5 Plating	g on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour		83.620					3	
		TOTAL C.								
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		5/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	100.000		1,000,000 EU	1.47	Gamma-butyrolactone Total (mg)	96-48-0 Total Chip (Die)	100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in chemical substance is absent from the list above, the chemic	with EU Directive 2002/95 ternal design controls, sup al substance is NOT an int	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and	dS Recast Direct	ctive) and with	EU	1.47		Total		
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in hemical substance is absent from the list above, the chemic: porated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any regulatory concern	with EU Directive 2002/95 ternal design controls, sup- al substance is NOT an int- ent, there is no credible re- ulatory scheme world-wide ability standard for plastics	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concert.	IS Recast Directly to the best of ontration of the contraction of the	ctive) and with Microchip Tec chemical subs	EU	0.50	Total (mg)	Total Chip (Die) 7440-21-3	% of Total Weight	1.76
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in chemical substance is absent from the list above, the chemic- rporated's knowledge and belief as of the date of this docum- is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma: //ul.com/global/eng/pages/offerings/industries/chemicals/pla- protective "tubes" in which the specific product is shipped a	with EU Directive 2002/95 ternal design controls, sup- al substance is NOT an intent, there is no credible- ulatory scheme world-wide ibility standard for plastics stics/	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoppier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concert. S. You can access the UL iQTM family of databases the service of the	ds Recast Directly, to the best of ontration of the cooptain a test	ctive) and with Microchip Tec chemical subs	EU chnology tance, if		Total (mg) Doped Silicon	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	0.6
s semiconductor device and its homogenous materials complicative 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via in the chemical substance is absent from the list above, the chemical prorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma: "Julu.com/global/eng/pages/offerings/industries/chemicals/platicultory ("tubes" in which the specific product is shipped a ain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information in the original packing materials is true and correct to the best of inpleteness and accuracy of data in this form because it has be transfer in the control of the protected from disclosure as trade secrets at rovided only as estimates of the average weight of these parts.	with EU Directive 2002/95 ternal design controls, sup- al substance is NOT an int- ent, there is no credible re- ulatory scheme world-wide ibility standard for plastics stics/ re made from polyvinyl chi is form concerning substates ts knowledge and belief, as- ten compiled based on the ad some information may is and the average weight of	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoppier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concerts. b. You can access the UL iQTM family of databases to loride (PVC) plastic. "Window envelopes" used to he ances restricted by RoHS in Microchip Technology Ir so of the date listed in this form. Microchip Technology is ranges provided in Material Safety Data Sheets protot have been provided by subcontract assemblers of anticipated significant toxic metals components. T	Is Recast Direct I, to the best of Intration of the co Is obtain a test Is	Microchip Tecchemical subs report at slip on the out semiconductor d cannot guara naterial supplie	EU chnology tance, if ter box and devices in intee the ers. Supplier iformation		Total (mg) Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	0.6
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via in chemical substance is absent from the list above, the chemical inporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma: //ul.com/global/eng/pages/offerings/industries/chemicals/pla: protective "tubes" in which the specific product is shipped a ain "reels" may be made from PVC plastic. rochip Technology Incorporated believes the information in the roriginal packing materials is true and correct to the best of in pleteness and accuracy of data in this form because it has be rmation is often protected from disclosure as trade secrets an rovided only as estimates of the average weight of these part.	with EU Directive 2002/95 ternal design controls, sup- al substance is NOT an int- ent, there is no credible re- allatory scheme world-wide ability standard for plastics stics/ re made from polyvinyl chi- is form concerning substats knowledge and belief, a- ten compiled based on the disome information may is and the average weight of ain silicon devices (silicon ty, express or implied, with	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoppier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concert. 5. You can access the UL iQTM family of databases to loride (PVC) plastic. "Window envelopes" used to have seen that the data listed in this form. Microchip Technology in anges provided in Material Safety Data Sheets proof have been provided by subcontract assemblers of anticipated significant toxic metals components. To IC) in the finished parts. The respect to the information provided in this declarate toxic metals contains the declarate of the provided in this declarate or the provided in the provided in this declarate or the provided in the provided in this declarate or the provided in the	IS Recast Direct I, to the best of Intration of the co I oo obtain a test I old the packing Incorporated's significant Incorporated by raw materi I hese estimates I have estimated.	Microchip Tecchemical subs report at slip on the ou semiconductor d cannot guara taterial supplic s do not include sive, limited pr	EU chnology tance, if ter box and devices in intee the irs. Supplier information le trace		Total (mg) Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	0.6
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in hemical substance is absent from the list above, the chemical properties of the date of this docume is not below the threshold of regulatory concern for any regulation of the date of this docume in group of the date of the date of this docume in group of the date of the	with EU Directive 2002/95 ternal design controls, sup- al substance is NOT an intent, there is no credible re- ilatory scheme world-wide ibility standard for plastics stics/ re made from polyvinyl chi- is form concerning substats knowledge and belief, ar- ten compiled based on the nd some information may re- in silicon devices (silicon ty, express or implied, with is subsidiaries are contain es to Material Content Dec-	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rohoppier declarations, and /or analytical test data. In the properties of the semiconductor device and ason to believe that the unavoidable impurity concerts. In the semiconductor device and ason to believe that the unavoidable impurity concerts. In the semiconductor device and son to believe that the unavoidable impurity concerts. In the semiconductor device and son to be semiconductor of the semiconduc	Is Recast Direct I, to the best of intration of the coordinates Is obtain a test Is obtain	Microchip Tecchemical substreport at slip on the outside a supplied all supplied all suppliers. It is do not include sive, limited preprovided in No., consequentia,	EU chnology tance, if ter box and devices in intee the irs. Supplier iformation te trace coduct licrochip's	0.50	Total (mg) Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.6

QR 16 QSOP 11:07 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: OA. SN. TC. SAE	08 (Lead) (SOIC) (Small Outline -150mil) (C2/CC)		nation Base opper Alloy (0				geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	malnort		62.24	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	mg/part 54.096	ppm 693.542		Silica, vitreous	60676-86-0	86.91	Ī
Epoxy Resin	Trade Secret	Mold Compound	6.121	4.774	61,207		Epoxy Resin	Trade Secret	7.67	
Phenolic Resin	Trade Secret	Mold Compound	4.078	3.181	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.193	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.031	7.825	100.314		Carbon black	Total	0.00	1
Iron	7439-89-6	Lead Frame	0.247	0.192	2,468	8.19	(mg) Total	Lead Frame	% of Total Weight	
Silver	7440-22-4	Lead Frame	0.247	0.192	2,400	8.19		7440-50-8		10.5
	7440-22-4		0.200	0.156			Copper		95.54	
Zinc		Lead Frame			131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0 7440-22-4	Lead Frame Die Attach	0.009	0.007	87		Silver	7440-22-4	1.91 0.13	
Silver (Ag)			0.563	0.439	5,625		Zinc	7440-66-6		
Modified Epoxy Resin	13561-08-5	Die Attach	0.105		1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.044	563			Total		
Modified Amine	827-43-0	Die Attach	0.026	0.020	263	0.59	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	5.850	75,000		Silver (Ag)	7440-22-4	75	
Doped Gold	7440-57-5	Wire Bond	0.200	0.156	2,000		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5 Plating or	n external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.975	12,500		Diglycidylether of bisphenol-F	54208-63-8	8	
		TOTALS:	100.000	78.000	1,000,000		Modified Amine		4	
		al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHS Rec	ast Directive)	and with EU	Directive	5.85	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	
n2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified vertices has been verified vertices has been verified vertices. The chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this do	omply with EU Directive 2002/95/EC ria internal design controls, supplie emical substance is NOT an intentic cument, there is no credible reason	c (RoHS Directive), EU Directive 2011/65/EU (RoHS Rec er declarations, and /or analytical test data. onal ingredient in the semiconductor device and, to the	e best of Micr	ochip Techno	logy	5.85	(mg) Total Doped Silicon		% of Total Weight	7.5
2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified we chemical substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this do below the threshold of regulatory concern for any regulading compounds used by Microchip meet the UL94 V0 flabs://ul.com/global/eng/pages/offerings/industries/chemicals.	omply with EU Directive 2002/95/EC ia internal design controls, supplie emical substance is NOT an intentic cument, there is no credible reason tory scheme world-wide.	c (RoHS Directive), EU Directive 2011/65/EU (RoHS Rec er declarations, and /or analytical test data. onal ingredient in the semiconductor device and, to the n to believe that the unavoidable impurity concentratio ou can access the UL iQTM family of databases to obta	e best of Micr n of the chen in a test repo	ochip Techno nical substand ort at	logy e, if any, is	0.16	Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	7.5
is semiconductor device and its homogenous materials or 02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified von the characteristic substance is absent from the list above, the characteristic stronger and belief as of the date of this do to below the threshold of regulatory concern for any regular belong compounds used by Microchip meet the UL94 V0 flap://ul.com/global/eng/pages/offerings/industries/chemicals e protective "tubes" in which the specific product is shipp train "reels" may be made from PVC plastic.	omply with EU Directive 2002/95/EC ia internal design controls, supplie emical substance is NOT an intentic cument, there is no credible reason tory scheme world-wide.	c (RoHS Directive), EU Directive 2011/65/EU (RoHS Rec er declarations, and /or analytical test data. onal ingredient in the semiconductor device and, to the n to believe that the unavoidable impurity concentratio ou can access the UL iQTM family of databases to obta	e best of Micr n of the chen in a test repo	ochip Techno nical substand ort at	logy e, if any, is		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	7.5
npliance with the above EU Directive). Impliance with the above EU Directives has been verified we chemical substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this do to below the threshold of regulatory concern for any regular diding compounds used by Microchip meet the UL94 V0 flat p://ul.com/global/eng/pages/offerings/industries/chemicals perotective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information of original packing materials is true and correct to the besimpleteness and accuracy of data in this form because it information is often protected from disclosure as trade secretorided only as estimates of the average weight of these pa	omply with EU Directive 2002/95/EC ria internal design controls, supplie emical substance is NOT an intentic cument, there is no credible reasor tory scheme world-wide. Immability standard for plastics. You standard for plastics. You shall be supplied to the form concerning substance to fits knowledge and belief, as of as been compiled based on the ran stand some information may not it its and some information may not its and some information may not its and the average weight of antice.	c (RoHS Directive), EU Directive 2011/65/EU (RoHS Recomment of the content of the	e best of Micr n of the chen in a test repo packing slip prated's semi proprated can y raw material su	orchip Technonical substant ort at on the outer conductor de unot guarantee in suppliers. S	logy be, if any, is box and vices in the the supplier nation is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	0.2
no 2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified we are chemical substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this do to be to the theory to the threshold of regulatory concern for any regular bidding compounds used by Microchip meet the UL94 V0 flap://ul.com/global/eng/pages/offerings/industries/chemical: The protective "tubes" in which the specific product is shipped.	omply with EU Directive 2002/95/EC ria internal design controls, supplies and a substance is NOT an intentic cument, there is no credible reason tory scheme world-wide. Immability standard for plastics. You supplies the supplies of the s	c (RoHS Directive), EU Directive 2011/65/EU (RoHS Recomment of the content of the	e best of Micr n of the chen in a test repo packing slip prated's semi proprated can by raw materi w material su imates do no	ochip Techno nical substant ort at on the outer conductor de inot guaranter ial suppliers. Si ippliers. Inforn it include trace	logy box and vices in the Supplier levels of		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	0.2
nepliance with the above EU Directives has been verified we chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do below the threshold of regulatory concern for any regular liding compounds used by Microchip meet the UL94 V0 flap. I/ul.com/global/eng/pages/offerings/industries/chemicals aprotective "tubes" in which the specific product is shipp tain "reels" may be made from PVC plastic. Torochip Technology Incorporated believes the information if original packing materials is true and correct to the best promoted only as estimates of the average weight of these parants, metals, and non-metal materials contained within secreptive of containing the provided by Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated designs in the corporated of the solutions of the corporated of the provide any warranties provided by Microchip Technology Incorporated designs in the corporated of the corporated of the provide any warranties provided by Microchip Technology Incorporated of the corporated of th	omply with EU Directive 2002/95/EC ria internal design controls, supplie amical substance is NOT an intentic cument, there is no credible reason tory scheme world-wide. Immability standard for plastics. You shall be supplied based on the range of the supplied based on the range substance to fits knowledge and belief, as of as been compiled based on the ranges and the average weight of antic filicon devices (silicon IC) in the finiturnanty, express or implied, with resand its subsidiaries are contained in anges to Material Content Declara	ROHS Directive), EU Directive 2011/65/EU (ROHS Recommended in the semiconductor device and, to the not believe that the unavoidable impurity concentration out can access the UL iQTM family of databases to obtain the semiconductor device and, to the decommended in the semiconductor device and, to the decommended in the semiconductor of the databases to obtain the semiconductor of the databases to obtain the semiconductor of the databases of the database of the semiconductor of the semiconduct	e best of Micron of the chen in a test reportated's semi- proporated can by raw material w material su imates do no the exclusive, hese are prov-	ort at on the outer conductor deinot guarantee als suppliers. Sippliers. Information tinclude trace limited production Micro	logy box and vices in the supplier nation is elevels of ct chip's otherwise,	0.16	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin /	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

OA SN TC SAE 08 SOIC 11:07 AM : 8/29/2013

Halogen-Free

MICROCHIP				ination Base opper Alloy (•		Package Homoge 8.1 Electronics (e.g.		ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Semiconductor Device Typ	e: SAF 08 (Lead) SOIC 3.90mm(.150in) (3B) "Contained In"	% Total	1						
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	45.00	(mg) Total	Mold Compound	% ot Total Weight	60
Silica, vitreous	60676-86-0	Mold Compound	51.000	38.250	510,000		Silica, vitreous	60676-86-0	85.0000	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.675	2.756	36,750	i	Epoxy Resin	Trade Secret	6.1250	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.675	2.756	36,750	1	Phenolic Resin		6.1250	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.470	1.103	14,700	1	Epoxy, Cresol Novolac		2.4500	
Carbon Black	1333-86-4	Mold Compound	0.180	0.135	1,800	1	Carbon Black		0.3000	
Copper	7440-50-8	Lead Frame	30.572	22.929	305,720	1		Total	100.00	l
Iron	7439-89-6	Lead Frame	0.752	0.564	7,520	24.00	(mg) Total	Lead Frame	% of Total	32
					,	24.00			Weight	J2
Silver	7440-22-4	Lead Frame	0.610	0.457	6,096		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.040	0.030	400	1	Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.026	0.020	264	1	Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.059	0.044	592	1	Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.016	0.012	160	l	Phosphorous	7723-14-0	0.08	
Metal oxide	Trade Secret	Die Attach	0.002	0.002	24			Total	100.00	
Gamma-butyrolactone	96-48-0	Die Attach	0.002	0.002	24	0.06	(mg) Total	Die Attach	% of Total Weight	0.08
Silicon	7440-21-3	Chip (Die)	4.820	3.615	48,200		Silver	7440-22-4	74	
Doped Gold	7440-57-5	Wire Bond	0.100	0.075	1,000	i	Epoxy resin	Trade Secret	20	
Nickel	7440-02-0	Plating on external leads (pins)	2.835	2.126	28,350	i	Metal oxide	Trade Secret	3	
Palladium	7440-05-03	Plating on external leads (pins)	0.150	0.113	1,500	1	Gamma-butyrolactone	96-48-0	3	
Gold	7440-57-5	Plating on external leads (pins)	0.015	0.011	150	1		Total	100.00	l
Cold	1440 01 0			0.011	100			1	% of Total	
		TOTALS:	100.000	75.000	1,000,000	3.62	(mg) Total	Chip (Die)	Weight	4.82
	0.0750	n Total Mass								
is semiconductor device and its homogenous materials comply	with EU Directive 20	002/95/EC (RoHS Directive), EU Directive	re 2011/65/EU	(RoHS Recas	st Directive)		Doped Silicon	7440-21-3 Total	100 100.00	
nis semiconductor device and its homogenous materials comply and with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Dire	ctive).	, , ,		(RoHS Recas	st Directive)			Total	100.00	<u> </u>
	ctive).	, , ,		(RoHS Recas	st Directive)	0.08	Doped Silicon (mg) Total			0.1
nd with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Dire	ctive). ernal design control: Il substance is NOT a the date of this docu	s, supplier declarations, and /or analyti an intentional ingredient in the semicor ment, there is no credible reason to be	cal test data. nductor devic lieve that the	e and, to the l	best of	0.08		Total	100.00 % of Total	0.1
nd with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been verified via into a chemical substance is absent from the list above, the chemical crochip Technology Incorporated's knowledge and belief as of concentration of the chemical substance, if any, is not below the folding compounds used by Microchip meet the UL94 V0 flamma	ctive). ernal design control: al substance is NOT a the date of this docu chreshold of regulato bility standard for pl	s, supplier declarations, and /or analyti an intentional ingredient in the semicor ment, there is no credible reason to be ry concern for any regulatory scheme v	cal test data. Inductor devic lieve that the world-wide.	e and, to the l unavoidable	best of impurity	0.08	(mg) Total	Total Wire Bond	100.00 % of Total Weight	0.1
nd with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive pompliance with the above EU Directives has been verified via interpretation and chemical substance is absent from the list above, the chemical icrochip Technology Incorporated's knowledge and belief as of procentration of the chemical substance, if any, is not below the folding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/pages/offerings/industries/c	ctive). ernal design control: al substance is NOT a the date of this docu chreshold of regulato bility standard for pl alastics/ re made from polyvin	s, supplier declarations, and /or analyti an intentional ingredient in the semicor ment, there is no credible reason to be ry concern for any regulatory scheme v astics. You can access the UL iQTM far	cal test data. ductor devic lieve that the world-wide. mily of databa	e and, to the l unavoidable ases to obtair	best of impurity n a test report	0.08	(mg) Total	Total Wire Bond 7440-57-5 Total Plating on external	100.00 % of Total Weight 100.00	0.1
and with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive and with EU Directive and particles and the above EU Directives has been verified via into an achemical substance is absent from the list above, the chemical circochip Technology Incorporated's knowledge and belief as of concentration of the chemical substance, if any, is not below the folding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/pages/offeri	ctive). ernal design controls all substance is NOT a the date of this docu- threshold of regulato bility standard for pl alastics/ re made from polyvin ic. is form concerning s and correct to the be- a accuracy of data in upplier information is rial suppliers. Inform	s, supplier declarations, and /or analytical intentional ingredient in the semicorment, there is no credible reason to be ry concern for any regulatory scheme vastics. You can access the UL iQTM fail yl chloride (PVC) plastic. "Window envulustances restricted by RoHS in Microst of its knowledge and belief, as of the this form because it has been complies often protected from disclosure as tration is provided only as estimates of	cal test data. Inductor devic lieve that the world-wide. Inductor device world-wide. Inductor database I	e and, to the l unavoidable ases to obtain i to hold the p ogy Incorpora n this form. M ie ranges pro ind some infor relight of thesi	best of impurity n a test report packing slip ated's licrochip vided in rmation may e parts and		(mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total	100.00 % of Total Waight 100.00 100.00 % of Total	
nd with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive pompliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical icroschip Technology Incorporated's knowledge and belief as of oncentration of the chemical substance, if any, is not below the folding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/p	ernal design controls al substance is NOT a the date of this docu threshold of regulato bility standard for pl lastics/ re made from polyvin ic. is form concerning s and correct to the be accuracy of data in upplier information is rial suppliers. Inform lents. These estimate y, express or implied orporated and its sul	s, supplier declarations, and /or analytical in intentional ingredient in the semicorment, there is no credible reason to be ry concern for any regulatory scheme wastics. You can access the UL iQTM fail yl chloride (PVC) plastic. "Window envulustances restricted by RoHS in Microst of its knowledge and belief, as of the this form because it has been compilers often protected from disclosure as tration is provided only as estimates of the solution is provided only as estimates of the solution in the control of th	cal test data. Inductor device lieve that the world-wide. Induction of database leopes used chip Technol e date listed in disased on the ade secrets as the average was, metals, and ded in this de disaster data di disaster data disaster data disaster data disaster data disaster	e and, to the l unavoidable ases to obtain I to hold the p ogy Incorpora In this form. M we ranges pro- nd some infor- leight of these d non-metal r	best of impurity n a test report backing slip ated's licrochip vided in rmation may e parts and materials e exclusive,		(mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	% of Total Weight 100.00 100.00 % of Total Weight	
d with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive divided with the above EU Directives has been verified via interpretation of the chemical substance is absent from the list above, the chemical archemical substance is absent from the list above, the chemical crochip Technology Incorporated's knowledge and belief as of incentration of the chemical substance, if any, is not below the colding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/page protective "tubes" in which the specific product is shipped at the outer box and certain "reels" may be made from PVC plast crochip Technology Incorporated believes the information in the miconductor devices in their original packing materials is true archnology Incorporated cannot guarantee the completeness and aterial Safety Data Sheets provided by raw material suppliers. So the have been provided by subcontract assemblers and raw mater as average weight of anticipated significant toxic metals componitationed within silicon devices (silicon IC) in the finished parts. Crochip Technology Incorporated does not provide any warrant inted product warranties provided by Microchip Technology Incorporated provided by Microchip Technology Incorporated Devices (silicon IC) in the finished parts.	ernal design controls al substance is NOT a the date of this docu threshold of regulato bility standard for pl alastics/ are made from polyvin ic. is form concerning s and correct to the be accuracy of data in upplier information is rial suppliers. Inform tents. These estimate y, express or implied orporated and its sul yledgement, and invo- ces to Material Conten a result of the users'	s, supplier declarations, and /or analytical in intentional ingredient in the semicorment, there is no credible reason to be ry concern for any regulatory scheme of astics. You can access the UL iQTM fail yill chloride (PVC) plastic. "Window environment of the control of the	cal test data. Inductor devic lieve that the world-wide. Inductor devic lieve that the world-wide. Inductor database elopes" used chip Technol date listed in d based on the de secrets a the average w ts, metals, an ded in this de standard terr or any damag	e and, to the lunavoidable ases to obtain to hold the pogy Incorporanthis form. Me ranges prond some infoi edight of these dinon-metal riclaration. The ms and conditions, direct or i	best of impurity n a test report backing slip ated's licrochip vided in rmation may e parts and materials e exclusive, tions of sale.		(mg) Total Doped Gold (mg) Total Nickel	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-02-0	100.00 % of Total Wainht 100.00 100.00 % of Total Weight	
In with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive mpliance with the above EU Directives has been verified via introchemical substance is absent from the list above, the chemical crochip Technology Incorporated's knowledge and belief as of incentration of the chemical substance, if any, is not below the inding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/pages/offe	ernal design controls al substance is NOT a the date of this docu threshold of regulato bility standard for pl alastics/ are made from polyvin ic. is form concerning s and correct to the be accuracy of data in upplier information is rial suppliers. Inform tents. These estimate y, express or implied orporated and its sul yledgement, and invo- ces to Material Conten a result of the users'	s, supplier declarations, and /or analytical in intentional ingredient in the semicorment, there is no credible reason to be ry concern for any regulatory scheme of astics. You can access the UL iQTM fail yill chloride (PVC) plastic. "Window environment of the control of the	cal test data. Inductor devic lieve that the world-wide. Inductor devic lieve that the world-wide. Inductor database elopes" used chip Technol date listed in d based on the de secrets a the average w ts, metals, an ded in this de standard terr or any damag	e and, to the lunavoidable ases to obtain to hold the pogy Incorporanthis form. Me ranges prond some infoi edight of these dinon-metal riclaration. The ms and conditions, direct or i	best of impurity n a test report backing slip ated's licrochip vided in rmation may e parts and materials e exclusive, tions of sale.		(mg) Total Doped Gold (mg) Total Nickel	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-02-0	100.00 % of Total Wainht 100.00 100.00 % of Total Weight 94.50	

SAF 08 SOIC 11:07 AM: 8/29/2013

MICROCHIP		0010		nation Base /			•	ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device	e Type: SL 14 (Lead)	SOIC (Small Outline - 150mil) (D3/DG)								es
Dania Subatawa	CAC Number	"Contained In" Sub-Component	% Total Weight			114.27	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number	•		mg/part	ppm		07	·	00.04	i -
Silica, vitreous Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	69.354 6.121	99.315 8.765	693,542 61.207		Silica, vitreous Epoxy Resin	60676-86-0 Trade Secret	86.91 7.67	
Phenolic Resin	Trade Secret	Mold Compound	4.078	5.839	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.354	2,474		Carbon Black		0.31	
Copper	7440-50-8	Lead Frame	10.031	14.365	100.314		Garbon Black	Total		<u>I</u>
Iron	7439-89-6	Lead Frame	0.247	0.353	2,468	15.04	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.286	2,000		Copper	7440-50-8	95.54	. 0.0
Zinc	7440-66-6	Lead Frame	0.013	0.019	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.012	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.806	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.150	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.081	563			Total	100.00	_
Modified Amine	827-43-0	Die Attach	0.026	0.038	263	1.07	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	10.740	75,000		Silver (Ag)	7440-22-4	75.00	
Doped Gold	7440-57-5	Wire Bond	0.200	0.286	2,000		Modified Epoxy Resin	13561-08-5	14.00	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	1.790	12,500		Diglycidylether of bisphenol-	54208-63-8	7.50	

his semiconductor device and its homogenous materials c		TOTALS: g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH		143.200	1,000,000 th EU		Modified Amine	827-43-0 Total		
	omply with EU Directive 20	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH			, ,	10.74	(mg) Total Doped Silicon	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	7.5
his semiconductor device and its homogenous materials contractive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for any	omply with EU Directive 20 via internal design controls nemical substance is NOT a ocument, there is no credit y regulatory scheme world	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerwide.	IS Recast Dire	ective) and win	th EU	10.74	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	7.5
his semiconductor device and its homogenous materials c irrective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the choorporated's knowledge and belief as of the date of this decorporated's knowledge and belief as of the date of this	omply with EU Directive 20 via internal design controls nemical substance is NOT a ocument, there is no credit y regulatory scheme world ammability standard for pla	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerwide.	IS Recast Dire	ective) and win	th EU	0.29	(mg) Total	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	7.5
his semiconductor device and its homogenous materials c irrective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for an tolding compounds used by Microchip meet the UL94 V0 flictory.	via internal design controls were a substance is NOT a comment, there is no credit y regulatory scheme world ammability standard for pla ts/plastics/	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concer-wide. astics. You can access the UL iQTM family of databases to	IS Recast Dire	f Microchip T chemical sub	echnology		(mg) Total Doped Silicon	Total Chip (Die) 7440-21-3 Total	100.00 % of Total Weight 100 100.00	7.5
his semiconductor device and its homogenous materials c circetive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the hocroporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 fl: ttp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is ship.	via internal design controls via internal design controls nemical substance is NOT a ocument, there is no credit y regulatory scheme world ammability standard for pla is/plastics/ ped are made from polyvin n in this form concerning s best of its knowledge and I e it has been compiled bas rade secrets and some info ight of these parts and the	g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), supplier declarations, and /or analytical test data. 101 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. 102 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. 103 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concervide. 104 intentional ingredient in the semiconductor device and provide (PVC) plastic. "Window envelopes" used to hope the intentional intention	is Recast Direct, to the best on the total of the oo obtain a test old the packing accorporated's logy incorpor, provided by remblers and remblers a	f Microchip To chemical sub treport at g slip on the co semiconduct ated cannot g aw material s aw material s	echnology stance, if outer box or devices uarantee uppliers. uppliers.		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	0.2
his semiconductor device and its homogenous materials c irrective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the chacorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for any lolding compounds used by Microchip meet the UL94 V0 flettp://ul.com/global/eng/pages/offerings/industries/chemical he protective "tubes" in which the specific product is ship and certain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information their original packing materials is true and correct to the lee completeness and accuracy of data in this form because supplier information is often protected from disclosure as truformation is provided only as estimates of the average we	via internal design controls nemical substance is NOT a ocument, there is no credit y regulatory scheme world ammability standard for pla is/plastics/ ped are made from polyvin n in this form concerning s best of its knowledge and it e it has been compiled bas rade secrets and some info ight of these parts and the rials contained within silice arranty, express or implied and its subsidiaries are co	g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), supplier declarations, and /or analytical test data. 101 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. 102 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. 103 intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. 104 intentional ingredient in the unavoidable impurity concervide. 105 intentional ingredient intentional intentio	IS Recast Direct to the best of the best of the packing the packin	f Microchip T chemical sub treport at g slip on the of semiconduct ated cannot g aw material s aw material s sese estimates	echnology stance, if buter box or devices uarantee uppliers. id o not		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight	0.2
his semiconductor device and its homogenous materials of irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the choorporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any concern for	omply with EU Directive 20 via internal design controls nemical substance is NOT a ocument, there is no credit y regulatory scheme world ammability standard for pla is/plastics/ ped are made from polyvin n in this form concerning s best of its knowledge and le it has been compiled bas- rade secrets and some info- ight of these parts and the rials contained within silico arranty, express or implied and its subsidiaries are co invoices. changes to Material Conten ne users' reliance on the in	g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS), supplier declarations, and /or analytical test data. 101 intentional ingredient in the semiconductor device and, ple reason to believe that the unavoidable impurity concervide. 102 satics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to how the provided in the form. Microchip Technology In the provided in Material Safety Data Sheets is primation may not have been provided by subcontract asset average weight of anticipated significant toxic metals coron devices (silicon IC) in the finished parts. It, with respect to the information provided in this declarational in Microchip's standard terms and conditions of standard terms are conditions of standard terms and conditions of standard terms are conditions of standard terms and conditions of standard terms are conditions of standard terms and conditions of standard terms are conditions of standard terms and conditions of standard terms are conditions of standard terms and conditions of standard terms are conditions of standard terms are conditions of standard terms are conditions of standard t	is Recast Direct of the best of the best of the best of the packing of the packin	f Microchip Tochemical subtreport at g slip on the cosemiconductated cannot g aw material s aw material see estimates usive, limited e provided in tt, consequent	echnology stance, if buter box or devices uarantee uppliers. uppliers. uppliers to do not	0.29	(mg) Total Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

SL 14 SOIC 11:08 AM : 8/29/2013

Basic Substance	Semiconductor Device Typ	e: TF, F, OE, S	O, SL 16 (Lead) SOIC (Wide Outline - 300mil) (D9 / DZ)		nation Base A pper Alloy (C	•	8	Package Homoge 3.1 Electronics (e.g. p			JEDEC 97 Product Marking and/or Pkg. Labeling
Silica yiferous			"Contained In"		malnart	nnm	307.43	(mg) Total	Mold Compound		70.19
Figure Principle Residual Pr			•					Silica vitranus	60676-86-0		
Photography							1				
Egovy, Created Norolate 2009-08-22 Most Compound 1,720 17,103 1											
Copper 7440-95-8 Lead Frame 0.527 2.74 6.272 115.0 (mg) Total 100.00 (mg) Total 24.00.00 (mg) Total 24.00 (mg) Total 24.0								Epoxy, Cresol Novolac	29690-82-2	2.45	
Incompanies				0.211		2,106		Carbon Black	1333-86-4	0.30	
Signor (144-524 Lead Frame (158) (Copper	7440-50-8	Lead Frame	25.499	111.685	254,990	1		Total	100.00	<u>.</u> !
Silver 17449:274 County France 0.506 2.777 0.604 1.000 1.0	··						440.00	() T-1-1	Land France	% of Total	00.00
## Propophorus	Iron	7439-89-6	Lead Frame	0.627	2.747	6,272	116.90	(mg) Total	Lead Frame	Weight	26.69
Prosphorous 7723-14-0 Lead France 0.022 0.098 220 Silver 7440-224 1.91 Floory resin 17400-Secret Die Attach 0.101 0.438 1.000 Relations Die Attach 0.015 0.066 150 Relations Die Attach 0.05 0.066 150 Relations Die Attach 0.060 0.066 150 Relations Die Attach 0.060 0.066 150 Relations Die Attach 0.066 0.06			Lead Frame					Copper	7440-50-8	95.54	
Silver 7440-224 Die Attach 0.370 6.21 3.700 1.00											
Epoxy resin Trade Secret Die Attach 0.010 0.438 1,000 Propertionus Trade Secret Die Attach 0.015 0.066 150 Trad 100.000 Trade Trade Secret Die Attach 0.015 0.066 150 Trade								Silver			
Metal oxide Trade Secret Die Attach 0.015 0.066 150 2.19 (mg) Total 100.005 0.50 150 0.50 0.5	Silver										
Gamma-butyrolactone 96-48-0 Die Attach Silcon 7440-21-3 Chip (Die) 1.850 Silcon 1.8	Epoxy resin	Trade Secret	Die Attach	0.100	0.438	1,000		Phosphorous	7723-14-0	0.08	
Salton 744021-3 Chip (Die) 1.8550 8.103 18,500 Condition	Metal oxide	Trade Secret	Die Attach	0.015	0.066	150	•		Total	100.00	•
Selection 1 7440-21-3 Patring on external leads joing - Maint Time Annealed at 1507 (or 1 ton) 0.850 0.104 16.500 1.000 1.							0.40	() T-1-1	Die Aussi	% of Total	0.5
Tim 7440-31-5 Patrg on external teasts (prote). Mathr Tin / armenated at 150°C for 1 hour / 100.000 438.000 1,000,000 43	Gamma-butyrolactone	96-48-0	Die Attach	0.015	0.066	150	2.19	(mg) Fotal	Die Attach	Weiaht	0.5
A380 g Total Mass O.4380 g Total Mass O.4480 g To	Silicon	7440-21-3	Chip (Die)	1.850	8.103	18,500		Silver	7440-22-4	74	
O.4380 g Total Mass O.4390 g Total Mass O.5490 g Total Mass O.5590 g	Gold		Wire Bond	0.090	0.394	900		Epoxy resin	Trade Secret	20	
0.4380 g Total Mass O.4380 g Total Mass O.440-21:3 0 100 O.540-21:3 100	Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour						Trade Secret	3	
Semiconductor device and its homogenous materials comply with EU Directive 2002/93/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU at the 2002/93/EC (End-of-Life Vehicles (ELV) Directive). Semiconductor device and its homogenous materials comply with EU Directive 2002/93/EC (RoHS Directive), EU Directive). EU Directive 2011/65/EU (RoHS Recast Directive) and with EU at the 2002/93/EC (End-of-Life Vehicles (ELV) Directive). Semiconductor device and its homogenous materials comply with EU Directive 2002/93/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU at the 2002/93/EC (End-of-Life Vehicles (ELV) Directive). Semiconductor device and its homogenous materials completed the above EU Directive 2011/65/EU (RoHS Recast Directive) and with EU at the 2002/93/EC (End-of-Life Vehicles (ELV) Directive). Semiconductor device and its homogenous materials completed in the above EU Directive vehicles (ELV) Directive). Semiconductor device and, to the best of Microchip Technology (protective Technology (protective Technology (protective Technology Incorporated as ubstance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Semiconductor device and, to the best of Microchip Technology (protective Technology Incorporated Substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Semiconductor device and, to the best of Microchip Technology (protective Technology Incorporated Substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Semiconductor device and, to the best of Microchip Technology (protective Technology Incorporated Substance, if is not below the threshold of the packing substance is not believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Semiconductory in the semiconductory of the packing and the semiconduc			TOTALS:	100.000	438.000	1,000,000		Gamma-butyrolactone	96-48-0	3	
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU a.10 Total (mg) Chip (Die) % of Total (ve) Chip (Die) (Di											
ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at 0.39 (mg) Total Wire Bond % of Total Weight	· ·		<u> </u>	HS Recast Dire	ective) and wi	th EU	8.10	Total (mg)		% of Total	1.85
certain "reels" may be made from PVC plastic. Total 100.00 Total 100.0	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in themical substance is absent from the list above, the chemic porated's knowledge and belief as of the date of this docum	y with EU Directive ternal design contr al substance is NOT ent, there is no cred	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro ols, supplier declarations, and /or analytical test data. If an intentional ingredient in the semiconductor device and dible reason to believe that the unavoidable impurity conc	d, to the best o	of Microchip T	echnology	8.10		Chip (Die) 7440-21-3	% of Total Weight	1.85
inchip Technology Incorporated believes the information in this form concerning substances restricted by ROHS in Microchip Technology Incorporated's semiconductor devices being original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Plier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. In the section of the exercise of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Tochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in rochip's quotations, sales order acknowledgement, and invoices. 2.98 (mg) Total Weight 2.98 (mg) Total Tin 7440-31-5 100.00	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in hemical substance is absent from the list above, the chemic porated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reg ing compounds used by Microchip meet the UL94 V0 flamm.	y with EU Directive ternal design contr al substance is NOT ent, there is no crea ulatory scheme wor ability standard for	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro ols, supplier declarations, and /or analytical test data. Γ an intentional ingredient in the semiconductor device an dible reason to believe that the unavoidable impurity conc rld-wide.	d, to the best o	of Microchip T e chemical sul	echnology		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
external leads (pins) - Matter Tin / Januarded at the football of the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00 Tin 7440-31-5 100.00 Tin 7440-31-5 100.00	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in themical substance is absent from the list above, the chemic porated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reg ing compounds used by Microchip meet the UL94 V0 flamm. I/ul.com/global/eng/pages/offerings/industries/chemicals/pla protective "tubes" in which the specific product is shipped a	y with EU Directive ternal design control substance is NOT ent, there is no creculatory scheme wor ability standard for stics/	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro ols, supplier declarations, and /or analytical test data. If an intentional ingredient in the semiconductor device and dible reason to believe that the unavoidable impurity conc rid-wide. plastics. You can access the UL iQTM family of databases	d, to the best of entration of the to obtain a tes	of Microchip T e chemical sul st report at	echnology ostance, if		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
erwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00 fthis Certificate of Compliance for semiconductor products.	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in the the interest in the state of this document is not below the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 flamme (ful.com/global/eng/pages/offerings/industries/chemicals/plaorotective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information in their original packing materials is true and correct to the best completeness and accuracy of data in this form because it has been disclosure as trade; and materials is provided only as estimates of the average weight of the state of the state of the average weight of the state of the state of the average weight of the state of the s	y with EU Directive ternal design control al substance is NOTent, there is no creculatory scheme wor ability standard for stics/ re made from polyw his form concerning of its knowledge and some in stecerets and some in of these parts and the	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro 2003/95/EC (Ro 2003/95/E	d, to the best of entration of the stood of the bodd the packling incorporated to the provided by semblers and	of Microchip T e chemical sul st report at ng slip on the s semiconduct rated cannot g raw material s	echnology ostance, if outer box or devices puarantee uppliers. uppliers.		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total	% of Total Weight 100 100.00 % of Total Weight	
Total 100.00	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in themical substance is absent from the list above, the chemic porated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 flamm. //ul.com/global/eng/pages/offerings/industries/chemicals/plaprotective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. The process of data in this form because it has ompleteness and accuracy of data in this form because it has offer information is often protected from disclosure as trade a mation is provided only as estimates of the average weight of trace levels of dopants, metals, and non-metal materials on cohip Technology Incorporated does not provide any warran anties provided by Microchip Technology Incorporated and in this provided and warran anties provided by Microchip Technology Incorporated and in this provide and warran anties provided by Microchip Technology Incorporated and in this provide and in the pro	y with EU Directive ternal design control al substance is NOTent, there is no creculatory scheme wor ability standard for stics/ re made from polyw his form concerning of its knowledge and s been compiled be secrets and some in of these parts and it contained within sil ty, express or impli ts subsidiaries are	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro 2003/95/EC (Ro	d, to the best of entration of the sto obtain a test hold the packil incorporated's provided by semblers and omponents. The ation. The excitation.	of Microchip T e chemical sul st report at ng slip on the s semiconduct rated cannot g raw material s nese estimates	echnology ostance, if outer box or devices puarantee uppliers. do not product	0.39	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.09
	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in the the interest of the state of the chemic porated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 flamms (//ul.com/global/eng/pages/offerings/industries/chemicals/plagorotective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information in the project of the best in the form because it has been and accuracy of data in this form because it has been information is often protected from disclosure as tradest mation is provided only as estimates of the average weight of detrace levels of dopants, metals, and non-metal materials of the complete provided by Microchip Technology Incorporated and anties provided by Microchip Technology Incorporated and anties provided by Microchip Technology Incorporated and incorporated disclaims any duty to notify users of updates or change weight, and involochip disclaims any duty to notify users of updates or change weight, and involochip disclaims any duty to notify users of updates or change weight.	y with EU Directive ternal design control al substance is NOTent, there is no creculatory scheme wor ability standard for stics/ re made from polyw his form concerning of its knowledge and so been compiled be secrets and some in of these parts and it contained within sil ty, express or impli ts subsidiaries are ces. es to Material Conte	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro cols, supplier declarations, and /or analytical test data. If an intentional ingredient in the semiconductor device and dible reason to believe that the unavoidable impurity conceld-wide. plastics. You can access the UL iQTM family of databases winyl chloride (PVC) plastic. "Window envelopes" used to be substances restricted by RoHS in Microchip Technology delief, as of the date listed in this form. Microchip Technosed on the ranges provided in Material Safety Data Sheet information may not have been provided by subcontract as ne average weight of anticipated significant toxic metals conditions (silicon IC) in the finished parts.	d, to the best of entration of the to obtain a test hold the packing lincorporated's nology incorpo is provided by semblers and omponents. The ation. The excit of sale. These addirect or indirect or	of Microchip T e chemical sul st report at ng slip on the s semiconduct rated cannot of raw material s raw material s nese estimates lusive, limited tre provided in	echnology ostance, if outer box or devices juarantee uppliers. uppliers. do not product	0.39	Doped Silicon (mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin Languaged at	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.09

TF F OE SO SL 16 SOIC 11:08 AM : 8/29/2013

Semiconductor Device Typ	e: SL 16 (Lead)	SOIC (Small Outline - 150mil) (D7 / DV)	_	nation Base A				nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			22.22	() T . (.)			20.10
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	60.00	(mg) Total	Mold Compound	% ot Total Weight	38.12
Silica, vitreous	60676-86-0	Mold Compound	32.402	51.001	324,020		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	2.335	3.675	23,349		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	2.335	3.675	23,349		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	0.934	1.470	9,339		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.114	0.180	1,144		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	24.276	38.211	242,761			Total		
Iron	7439-89-6	Lead Frame	0.597	0.940	5,971	40.00	(mg) Total	Lead Frame	% of Total Weight	25.41
Silver	7440-22-4	Lead Frame	0.484	0.762	4,841		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.032	0.050	318		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.021	0.033	210		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	2.618	4.120	26,175		Zinc	7440-66-6	0.13	
Diester Resin	94-80-4	Die Attach	0.524	0.824	5,235		Phosphorous	7723-14-0	0.08	
Functionalized Urethane Resin	72869-86-4	Die Attach	0.175	0.275	1,745			Total	100.00	
Epoxy Resin	9003-36-5	Die Attach	0.087	0.137	873	5.49	(mg) Total	Die Attach	% of Total Weight	3.49
Epoxy Resin	13561-08-5	Die Attach	0.087	0.137	873		Silver	7440-22-4	75	
Silicon	7440-21-3	Chip (Die)	3.180	5.005	31,800		Diester Resin	94-80-4	15	
Gold	7440-57-5	Wire Bond	1.210	1.905	12,100	Fun	ctionalized Urethane Resin	72869-86-4	5	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	28.590	45.001	285,900		Epoxy Resin	9003-36-5	3	
•••		TOTALS:	100.000	157.400	1.000.000		Epoxy Resin		3	
		, , , , , , , , , , , , , , , , , , ,	13 Recast Dire	ctive) and with	EU	5.01	Total (mg)	Chip (Die)	% of Total Weight	3.18
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via in emical substance is absent from the list above, the chemic orated's knowledge and belief as of the date of this docum s not below the threshold of regulatory concern for any req	al substance is NOT ent, there is no credi	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	I, to the best o	f Microchip Te	chnology	5.01	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	100	3.18
liance with the above EU Directives has been verified via in emical substance is absent from the list above, the chemic	al substance is NOT ent, there is no credi ulatory scheme work ibility standard for pl	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide.	I, to the best of ntration of the	f Microchip Techemical subs	chnology	1.90		7440-21-3	100	1.21
liance with the above EU Directives has been verified via in nemical substance is absent from the list above, the chemic norated's knowledge and belief as of the date of this docum s not below the threshold of regulatory concern for any reg ng compounds used by Microchip meet the UL94 V0 flamma	al substance is NOT ent, there is no credi ulatory scheme work ibility standard for platics/	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases	I, to the best of ntration of the to obtain a test	f Microchip Te chemical subs t report at	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
liance with the above EU Directives has been verified via in lemical substance is absent from the list above, the chemic lorated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reg ing compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/pla rotective "tubes" in which the specific product is shipped a	al substance is NOT ant, there is no credi allatory scheme work ability standard for pl stics/ re made from polyvir is form concerning s ts knowledge and be teen compiled based d some information is and the average we	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases anyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lilef, as of the date listed in this form. Microchip Technoloon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components.	I, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate wided by raw r and raw mater	f Microchip Techemical substance of the conductor of cannot guaraterial supplications.	chnology stance, if uter box and r devices in antee the ers. Supplier information		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
liance with the above EU Directives has been verified via in lemical substance is absent from the list above, the chemic lorated's knowledge and belief as of the date of this docum is not below the threshold of regulatory concern for any reg ing compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/pla rotective "tubes" in which the specific product is shipped a in "reels" may be made from PVC plastic. chip Technology Incorporated believes the information in the original packing materials is true and correct to the best of in teteness and accuracy of data in this form because it has be nation is often protected from disclosure as trade secrets a vided only as estimates of the average weight of these part	al substance is NOT ant, there is no credi allatory scheme work ability standard for pl stics/ re made from polyvin is form concerning s ts knowledge and be teen compiled based of d some information of and the average we sin silicon devices (s ty, express or implie	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concest-wide. In the semiconductor device and ble reason to believe that the unavoidable impurity concest-wide. In the semiconductor of databases and concess the UL iQTM family of databases and chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lilef, as of the date listed in this form. Microchip Technologn the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Illicon IC) in the finished parts. d, with respect to the information provided in this declaration.	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw r and raw mater These estimate	f Microchip Techemical substance of the control of	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
liance with the above EU Directives has been verified via in temical substance is absent from the list above, the chemic borated's knowledge and belief as of the date of this documes not below the threshold of regulatory concern for any reging compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/plarotective "tubes" in which the specific product is shipped an "reels" may be made from PVC plastic. The prehnology Incorporated believes the information in the program of the product of the best of iteleness and accuracy of data in this form because it has be nation is often protected from disclosure as trade secrets a vided only as estimates of the average weight of these part of dopants, metals, and non-metal materials contained with this provided by Microchip Technology Incorporated and intesting provided by Microchip Technology Incorporated and intention provided by Microchip Technology Incorporated and intention provided by Microchip Technology Incorporated and intention provided by Microchip Technology Incorporated	al substance is NOT ent, there is no credi ulatory scheme work ibility standard for pi stics/ re made from polyvir is form concerning s ts knowledge and be en compiled based o nd some information s and the average we tin silicon devices (s ty, express or implie ts subsidiaries are co	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I dilef, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. "illicon IC) in the finished parts. d, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy Incorporate voided by raw r and raw mater These estimate tion. The exclusiale. These ar	f Microchip Techemical substance of the conductor of cannot guarnaterial supplicial suppliers. It is do not including the provided in Marconsequentit, consequentit	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct Aicrochip's	1.90	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	1.21

SL 16 SOIC 11:08 AM: 8/29/2013

AICROCHIP				ation Base A oper Alloy (C				ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type:	SO 18 (Lead)	SOIC (Wide Outline - 300mil) (F2 / FJ)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	383.84	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	67.830	326.262	678,300		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.888	23.510	48.878		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.888	23.510	48,878		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	9.404	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	1.152	2,394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	48.251	100,314			Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	1.187	2,468	50.51	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.962	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.063	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.042	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	2.706	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.505	1.050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.271	563			Total	100.00	
Modified Amine	827-43-0	Die Attach	0.026	0.126	263	3.61	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	36.075	75.000		Silver (Ag)	7440-22-4	75	****
Gold	7440-57-5	Wire Bond	0.200	0.962	2,000		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	6.013	12,500	Dic	lycidylether of bisphenol-F	54208-63-8	8	
	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	TOTALS:	100.000	481.000	1,000,000	5.8	Modified Amine	827-43-0	4	
	0.4040	a Total Mass		.0	.,000,000		Widamod / Willing	Total	100.00	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via inter In chemical substance is absent from the list above, the chemical is corporated's knowledge and belief as of the date of this documen	substance is NOT	an intentional ingredient in the semiconductor device an					Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
y, is not below the threshold of regulatory concern for any regula olding compounds used by Microchip meet the UL94 V0 flammabi p://ul.com/global/eng/pages/offerings/industries/chemicals/plasti e protective "tubes" in which the specific product is shipped are	ility standard for pl ics/	lastics. You can access the UL iQTM family of databases			outer hov	0.96	(mg) Total	Wire Bond	% of Total Weight	0.2
d certain "reels" may be made from PVC plastic.	made from polyvii	iyi cilionde (FVC) plastic. Willidow envelopes dised to i	ioid trie packii	ig slip on the t	outer box		Doped Gold	7440-57-5	100	
crochip Technology Incorporated believes the information in this								Total	100.00	
their original packing materials is true and correct to the best of i e completeness and accuracy of data in this form because it has i pplier information is often protected from disclosure as trade sec ormation is provided only as estimates of the average weight of t clude trace levels of dopants, metals, and non-metal materials co	been compiled bas crets and some info these parts and the	sed on the ranges provided in Material Safety Data Sheet ormation may not have been provided by subcontract as e average weight of anticipated significant toxic metals c	ts provided by semblers and	raw material s raw material s	suppliers. suppliers.					
their original packing materials is true and correct to the best of i completeness and accuracy of data in this form because it has I pplier information is often protected from disclosure as trade sec ormation is provided only as estimates of the average weight of t	been compiled bas crets and some infe these parts and the intained within silic c, express or implier subsidiaries are co	sed on the ranges provided in Material Safety Data Sheet ormation may not have been provided by subcontract as a average weight of anticipated significant toxic metals c on devices (silicon IC) in the finished parts. d, with respect to the information provided in this declar.	es provided by semblers and omponents. The ation. The excl	raw material s raw material s nese estimates usive, limited	suppliers. suppliers. s do not product	6.01	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight	1.25
their original packing materials is true and correct to the best of it completeness and accuracy of data in this form because it has in polier information is often protected from disclosure as trade secormation is provided only as estimates of the average weight of tolude trace levels of dopants, metals, and non-metal materials concrochip Technology Incorporated does not provide any warranty, tranties provided by Microchip Technology Incorporated and its	been compiled bas crets and some infe these parts and the ontained within silic c, express or implier subsidiaries are co is.	sed on the ranges provided in Material Safety Data Sheet ormation may not have been provided by subcontract as e average weight of anticipated significant toxic metals c on devices (silicon IC) in the finished parts. d, with respect to the information provided in this declar ontained in Microchip's standard terms and conditions o int Declarations and shall not be liable for any damages, o	es provided by semblers and omponents. The ation. The excl f sale. These a direct or indire	raw material s raw material s nese estimates usive, limited re provided in ct, consequen	suppliers. suppliers. s do not product	6.01	(mg) Total Tin	leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	1.25

SO 18 SOIC 11:08 AM : 8/29/2013

AICROCHIP Semiconductor Device Type	· SO 20/100	d) SOIC (Wide Outline - 300mil) (G5 / GS)		nation Base A pper Alloy (C				nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device Type	. 50 20 (Lea	"Contained In"	% Total					ı		es
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	389.37	(mg) Total	Mold Compound	% ot Total Weight	71.84
Silica, vitreous	60676-86-0	Mold Compound	61.064	330.967	610.640		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.400	23.849	44,002		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.400	23.849	44,002		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.760	9.540	17,601		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.216	1.168	2,155		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	24.735	134.062	247,347			Total	100.00	
Iron	7439-89-6	Lead Frame	0.608	3.298	6,084	140.32	(mg) Total	Lead Frame	% of Total Weight	25.89
Silver	7440-22-4	Lead Frame	0.493	2.673	4,932		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.032	0.175	324		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.021	0.116	214		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.252	1.364	2,516		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.068	0.369	680		Phosphorous	7723-14-0	0.08	
Metal oxide	Trade Secret	Die Attach	0.010	0.055	102			Total	100.00	
Gamma-butyrolactone	96-48-0	Die Attach	0.010	0.055	102	1.84	(mg) Total	Die Attach	% of Total Weight	0.34
Silicon	7440-21-3	Chip (Die)	1.150	6.233	11,500		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.100	0.542	1,000		Epoxy resin	Trade Secret	20	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.680	3.686	6,800		Metal oxide	Trade Secret	3	
		TOTALS:	100.000	542.000	1,000,000		Gamma-butyrolactone	96-48-0	3	
		g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	HS Recast Dire	ctive) and with	EU	6.23	Total (mg)	Total Chip (Die)	100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Appliance with the above EU Directives has been verified via interpretations.	with EU Directive 2	3002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh s, supplier declarations, and /or analytical test data.		·		6.23	Total (mg) Dope Silicon			1.15
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified via intended in the list above, the chemical porated's knowledge and belief as of the date of this docume	with EU Directive 2 ernal design control substance is NOT nt, there is no credi	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	d, to the best of	Microchip Ted	chnology	6.23		Chip (Die) 7440-21-3	% of Total Weight	1.15
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via into the mical substance is absent from the list above, the chemica porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguing compounds used by Microchip meet the UL94 V0 flammal	with EU Directive 2 ernal design control substance is NOT nt, there is no credi atory scheme work sility standard for pl	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concer- wide.	d, to the best of	Microchip Tec chemical subs	chnology	0.54		Chip (Die) 7440-21-3	% of Total Weight	1.15
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via introchemical substance is absent from the list above, the chemical reporated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal cl/ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped and	with EU Directive 2 rnal design control substance is NOT nt, there is no credi atory scheme work illity standard for pl ics/	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to	i, to the best of intration of the to obtain a test	Microchip Tec chemical subs	chnology tance, if		Dope Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	1.15
s semiconductor device and its homogenous materials comply active 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via interpretated in the chemical substance is absent from the list above, the chemical proprated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal ://ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped are ain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this roriginal packing materials is true and correct to the best of its pleteness and accuracy of data in this form because it has bermation is often protected from disclosure as trade secrets an arovided only as estimates of the average weight of these parts also of dopants, metals, and non-metal materials contained within	with EU Directive 2 rnal design control substance is NOT nt, there is no credi atory scheme work sility standard for pl cics/ e made from polyvir s form concerning s knowledge and be en compiled based d some information and the average we	Doz/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho Doz/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho Doz/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho Doz/95/EC (RoHS Directive), and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concewide. astics. You can access the UL iQTM family of databases the control of t	i, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate you'ded by raw r and raw mater	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie	chnology tance, if ter box and devices in intee the ers. Supplier		Dope Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	0.1
npliance with the above EU Directives has been verified via introchemical substance is absent from the list above, the chemical propagate is absent from the list above, the chemical propagate is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal stifful.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped are ain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this roriginal packing materials is true and correct to the best of it upleteness and accuracy of data in this form because it has bermation is often protected from disclosure as trade secrets an ovoided only as estimates of the average weight of these parts	with EU Directive 2 rnal design control substance is NOT nt, there is no credi atory scheme work bility standard for pl cics/ e made from polyvir s form concerning s k knowledge and be en compiled based d d some information and the average we n silicon devices (s t, express or implie	Doz/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concelladie. A wide reason to believe that the unavoidable impurity concelladies. By I chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In lief, as of the date listed in this form. Microchip Technologo the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers light of anticipated significant toxic metals components. Telicon IC) in the finished parts.	i, to the best of intration of the to obtain a test old the packing ncorporated's gy incorporate ovided by raw ra and raw mater These estimate	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial suppliers. Ir is do not include sive, limited pr	chnology tance, if ter box and devices in intee the ers. Supplier information le trace		Dope Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	0.1
pliance with the above EU Directives has been verified via interplance with the above EU Directives has been verified via interplance with the above EU Directives has been verified via interplance with the above EU Directives has been verified via interplance is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flammal //ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped are in "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information in thi original packing materials is true and correct to the best of it pleteness and accuracy of data in this form because it has be mation is often protected from disclosure as trade secrets an ovided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained within ochip Technology Incorporated does not provide any warranty anties provided by Microchip Technology Incorporated and its	with EU Directive 2 ernal design control substance is NOT nt, there is no credi atory scheme work illity standard for pl ics/ e made from polyvir s form concerning s s knowledge and be en compiled based of d some information and the average we n silicon devices (s s, express or implies subsidiaries are co	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roho 2002/95/EC (RoHS Directive), and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concelladies. You can access the UL iQTM family of databases the second of the control of the	i, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw rand raw mater These estimate tion. The exclusale. These arrierct or indirect	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial suppliers. Ir s do not include sive, limited pre e provided in M	chnology tance, if devices in innee the ers. Supplier information te trace	0.54	Dope Silicon (mg) Total Dope Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.1

SO 20 SOIC 11:08 AM : 8/29/2013

MICROCHIP Semiconductor Device Type	e: OG 24 (Lea	d) SOIC (Wide Outline - 300mil) (K3 / KS)		nation Base A pper Alloy (C	•		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
<u> </u>	<u> </u>	"Contained In"	% Total			462.27	(mg) Total	Mold Compound	% ot Total Weight	69.83
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	402.27	(ilig) rotal	word Compound	% of Total weight	09.03
Silica, vitreous	60676-86-0	Mold Compound	59.356	392.933	593,555		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.277	28.314	42,771		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.277	28.314	42,771		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.711	11.326	17,108		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.209	1.387	2,095		Carbon Black	1333-86-4	0.30	<u>J</u>
Copper	7440-50-8	Lead Frame	25.757	170.511	257,569			Total	100.00	
Iron	7439-89-6	Lead Frame	0.634	4.194	6,336	178.48	(mg) Total	Lead Frame	% of Total Weight	26.96
Silver	7440-22-4	Lead Frame	0.514	3.400	5,136		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.034	0.223	337		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.022	0.147	222		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.326	2.155	3,256		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.088	0.583	880		Phosphorous	7723-14-0	0.08	
Metal oxide	Trade Secret	Die Attach	0.013	0.087	132			Total	100.00	T .
Gamma-butyrolactone	96-48-0	Die Attach	0.013	0.087	132	2.91	(mg) Total	Die Attach	% of Total Weight	0.44
Silicon	7440-21-3	Chip (Die)	2.010	13.306	20,100		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.090	0.596	900		Epoxy resin	Trade Secret	20	1
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.670	4.435	6,700		Metal oxide	Trade Secret	3	1
		TOTALS:	100.000	662.000	1,000,000		Gamma-butyrolactone	96-48-0	3	1
	0.6620	g Total Mass						Total	100.00	4
This semiconductor device and its homogenous materials comply Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).			IS Recast Dire	ctive) and with	EU	13.31	Total (mg)	Chip (Die)	% of Total Weight	
	with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	dS Recast Dire	ctive) and with	EU	13.31	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	2.01
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 2 ernal design control il substance is NOT ent, there is no credii	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	l, to the best of	Microchip Tec	chnology	13.31		Chip (Die)	% of Total Weight	2.01
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via intended in the complex of the chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume	with EU Directive 2 ernal design control Il substance is NOT int, there is no credil latory scheme world bility standard for pl	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	l, to the best of ntration of the	Microchip Tec chemical subs	chnology	0.60		Chip (Die) 7440-21-3	% of Total Weight	2.01
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via int of a chemical substance is absent from the list above, the chemical ocorporated's knowledge and belief as of the date of this docume only, is not below the threshold of regulatory concern for any regulatory concern for any regulatory compounds used by Microchip meet the UL94 V0 flamma	with EU Directive 2 ernal design control al substance is NOT int, there is no credil latory scheme world bility standard for pl tics/	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. astics. You can access the UL iQTM family of databases	I, to the best of ntration of the	Microchip Tec chemical subs	chnology tance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight	2.01
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via int f a chemical substance is absent from the list above, the chemica noorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regulatory concern for any regulatory compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/plas	with EU Directive 2: ernal design control al substance is NOT int, there is no credil latory scheme world bility standard for pl titics/ e made from polyvir is form concerning s s knowledge and be en compiled based d some information and the average we	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children and control of the control of	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate wided by raw n and raw mater	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie	chnology tance, if ter box and devices in intee the ers. Supplier formation		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	2.01
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via interpretation of a chemical substance is absent from the list above, the chemical norporated's knowledge and belief as of the date of this docume may, is not below the threshold of regulatory concern for any reguive foliation of the delivers of the date of this docume foliation of the delivers of the US4 V0 flamma they. I'll. com/global/eng/pages/offerings/industries/chemicals/plas/the protective "tubes" in which the specific product is shipped at certain "reels" may be made from PVC plastic. Alicrochip Technology Incorporated believes the information in the heir original packing materials is true and correct to the best of it completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these parts	ernal design control al substance is NOT int, there is no credil altory scheme world bility standard for pl titics/ e made from polyvir is form concerning s s knowledge and be en compiled based d some information and the average we in silicon devices (si y, express or implier	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and choice in the concelling of the concelli	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw na and raw mater These estimate tion. The exclu	Microchip Tec chemical subs report at g slip on the ou semiconductor d cannot guara naterial suppliers. Ir is do not include sive, limited pr	chnology tance, if ter box and devices in intee the ers. Supplier information le trace		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	0.09
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via interpretation of a chemical substance is absent from the list above, the chemical norporated's knowledge and belief as of the date of this docume may, is not below the threshold of regulatory concern for any regulodiding compounds used by Microchip meet the UL94 V0 flamma thtp://ul.com/global/eng/pages/offerings/industries/chemicals/plas. The protective "tubes" in which the specific product is shipped an exertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in the heir original packing materials is true and correct to the best of its completeness and accuracy of data in this form because it has benformation is often protected from disclosure as trade secrets are provided only as estimates of the average weight of these parts evels of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warrant varranties provided by Microchip Technology Incorporated and it	with EU Directive 2: ernal design control al substance is NOT int, there is no credil altory scheme work bility standard for pl titics/ e made from polyvir is form concerning s is knowledge and be en compiled based of d some information and the average we in silicon devices (si y, express or implies s subsidiaries are co	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases anyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Tellicon IC) in the finished parts. d, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw nand raw mater hese estimate tion. The exclusale. These are irect or indirection of the contraction of the cont	Microchip Tecchemical substance of the microl substance of the microchip o	chnology tance, if devices in intee the ers. Supplier information le trace	0.60	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	% of Total Weight 100 100.00 % of Total Weight 100 100.00	2.01
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via inta a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regulation compounds used by Microchip meet the UL94 V0 flamma ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plas he protective "tubes" in which the specific product is shipped are ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the leir original packing materials is true and correct to the best of it ompleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets are provided only as estimates of the average weight of these parts evels of dopants, metals, and non-metal materials contained with licrochip Technology Incorporated does not provide any warrant arranties provided by Microchip Technology Incorporated and it uotations, sales order acknowledgement, and invoices. Ilicrochip disclaims any duty to notify users of updates or change therwise, suffered by users or third parties as a result of the use	with EU Directive 2: ernal design control al substance is NOT int, there is no credil altory scheme work bility standard for pl titics/ e made from polyvir is form concerning s is knowledge and be en compiled based of d some information and the average we in silicon devices (si y, express or implies s subsidiaries are co	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases anyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Tellicon IC) in the finished parts. d, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw nand raw mater hese estimate tion. The exclusale. These are irect or indirection of the contraction of the cont	Microchip Tecchemical substance of the microl substance of the microchip o	chnology tance, if devices in intee the ers. Supplier information le trace	0.60	Doped Silicon (mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.09

OG 24 SOIC 11:09 AM: 8/29/2013

Silica, vitreous Epoxy Resin (No bromine, No diantimony trioxide) Ti Phenolic Resin (No Br / CL Sb03, No diantimony trioxide) Ti Epoxy, Cresol Novolac Carbon Black Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	CAS Number 60676-86-0 Trade Secret Trade Secret Trade Secret 333-86-4 7440-50-8 7439-89-6 7440-66-6 7723-14-0 7440-62-4 13561-08-5 54208-63-8 827-43-0	"Contained In" Sub-Component Mold Compound Mold Compound Mold Compound Mold Compound Mold Compound Lead Frame	% Total Weight 67.830 4.888 4.888 1.955 0.239 10.031 0.247 0.200 0.013	mg/part 522.562 37.655 37.655 15.062 1.844 77.282 1.901	ppm 678,300 48,878 48,878 19,551 2,394 100,314 2,468	614.78	(mg) Total Silica, vitreous Epoxy Resin Phenolic Resin Epoxy, Cresol Novolac Carbon Black	Mold Compound 60676-86-0 Trade Secret Trade Secret 29690-82-2 1333-86-4 Total	% ot Total Weight 85.00 6.13 6.13 2.45 0.30	e3 79.8
Silica, vitreous Epoxy Resin (No bromine, No diantimony trioxide) Ti Phenolic Resin (No Br / CL Sb03, No diantimony trioxide) Ti Epoxy, Cresol Novolac Carbon Black Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	60676-86-0 Trade Secret Trade Secret 29690-82-2 1333-86-4 7440-50-8 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Mold Compound Mold Compound Mold Compound Mold Compound Mold Compound Mold Compound Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	67.830 4.888 4.888 1.955 0.239 10.031 0.247 0.200	522.562 37.655 37.655 15.062 1.844 77.282 1.901	678,300 48,878 48,878 19,551 2,394 100,314	614.78	Silica, vitreous Epoxy Resin Phenolic Resin Epoxy, Cresol Novolac	60676-86-0 Trade Secret Trade Secret 29690-82-2 1333-86-4	85.00 6.13 6.13 2.45	79.8
Epoxy Resin (No bromine, No diantimony trioxide) Phenolic Resin (No Br / CL SbO3, No diantimony trioxide) Ti Epoxy, Cresol Novolac Carbon Black Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	Trade Secret Trade Secret Trade Secret Trade Secret 29690-82-2 1333-86-4 7440-50-8 7449-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Mold Compound Mold Compound Mold Compound Mold Compound Mold Compound Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	4.888 4.888 1.955 0.239 10.031 0.247 0.200	37.655 37.655 15.062 1.844 77.282 1.901	48,878 48,878 19,551 2,394 100,314		Epoxy Resin Phenolic Resin Epoxy, Cresol Novolac	Trade Secret Trade Secret 29690-82-2 1333-86-4	6.13 6.13 2.45	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide) Epoxy, Cresol Novolac Carbon Black Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	Trade Secret 29690-82-2 1333-86-4 7440-50-8 7439-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Mold Compound Mold Compound Mold Compound Lead Frame Die Attach Die Attach	4.888 1.955 0.239 10.031 0.247 0.200	37.655 15.062 1.844 77.282 1.901	48,878 19,551 2,394 100,314		Phenolic Resin Epoxy, Cresol Novolac	Trade Secret 29690-82-2 1333-86-4	6.13 2.45	
Epoxy, Cresol Novolac 2	29690-82-2 1333-86-4 7440-50-8 7439-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Mold Compound Mold Compound Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	1.955 0.239 10.031 0.247 0.200	15.062 1.844 77.282 1.901	19,551 2,394 100,314		Epoxy, Cresol Novolac	29690-82-2 1333-86-4	2.45	
Carbon Black Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin 1 Diglycidylether of bisphenol-F 5 Modified Amine 5	1333-86-4 7440-50-8 7439-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Mold Compound Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	0.239 10.031 0.247 0.200	1.844 77.282 1.901	2,394 100,314			1333-86-4		
Copper Iron Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	7440-50-8 7439-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	10.031 0.247 0.200	77.282 1.901	100,314		Calboll black			
Iron	7439-89-6 7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Lead Frame Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	0.247 0.200	1.901					100.00	
Silver Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	7440-22-4 7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Lead Frame Lead Frame Lead Frame Lead Frame Die Attach Die Attach	0.200			80.89	(mg) Total	Lead Frame	% of Total Weight	10.5
Zinc Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	7440-66-6 7723-14-0 7440-22-4 13561-08-5 54208-63-8	Lead Frame Lead Frame Die Attach Die Attach			2,400	80.89		7440-50-8	95.54	10.5
Phosphorous Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	7723-14-0 7440-22-4 13561-08-5 54208-63-8	Lead Frame Die Attach Die Attach	0.013	0.101	131		Copper Iron	7440-50-8	2.35	
Silver (Ag) Modified Epoxy Resin Diglycidylether of bisphenol-F Modified Amine	7440-22-4 13561-08-5 54208-63-8	Die Attach Die Attach	0.009	0.067	87		Silver	7440-22-4	1.91	
Modified Epoxy Resin 1 Diglycidylether of bisphenol-F 5 Modified Amine	13561-08-5 54208-63-8	Die Attach	0.563	4.334	5,625		Zinc	7440-66-6	0.13	
Diglycidylether of bisphenol-F 5 Modified Amine	54208-63-8		0.105	0.809	1.050		Phosphorous	7723-14-0	0.08	
Modified Amine		Die Attach	0.056	0.433	563			Total	100.00	<u> </u>
		Die Attach	0.026	0.202	263	5.78	(mg) Total	Die Attach	% of Total Weight	0.75
	7440-21-3	Chip (Die)	7.500	57.780	75,000		Silver (Aa)	7440-22-4	75	• • • • • • • • • • • • • • • • • • • •
Gold	7440-57-5	Wire Bond	0.200	1.541	2.000		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5 Platir	ng on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	9.630	12,500	Dig	ycidylether of bisphenol-F	54208-63-8	8	
<u> </u>		TOTALS:	100.000	770.400	1,000,000	-	Modified Amine	827-43-0	4	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via internal di If a chemical substance is absent from the list above, the chemical subst Incorporated's knowledge and belief as of the date of this document, thet any, is not below the threshold of regulatory concern for any regulatory s	stance is NOT an in	tentional ingredient in the semiconductor device and, eason to believe that the unavoidable impurity concer				57.78	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	7.5
Molding compounds used by Microchip meet the UL94 V0 flammability st http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/	standard for plastic	s. You can access the UL iQTM family of databases to	o obtain a test	report at		1.54	(mg) Total	Wire Bond	% of Total Weight	0.2
The protective "tubes" in which the specific product is shipped are made certain "reels" may be made from PVC plastic.	de from polyvinyl ch	nloride (PVC) plastic. "Window envelopes" used to ho	old the packing	slip on the ou	ter box and		Doped Gold	7440-57-5	100	
Microchip Technology Incorporated believes the information in this form their original packing materials is true and correct to the best of its know completeness and accuracy of data in this form because it has been com information is often protected from disclosure as trade secrets and some is provided only as estimates of the average weight of these parts and the levels of dopants, metals, and non-metal materials contained within silico	owledge and belief, a ompiled based on the me information may the average weight	is of the date listed in this form. Microchip Technolog e ranges provided in Material Safety Data Sheets pro not have been provided by subcontract assemblers a of anticipated significant toxic metals components. T	gy Incorporated vided by raw materi	d cannot guara aterial supplic al suppliers. Ir	antee the ers. Supplier nformation			Total	100.00	-
Microchip Technology Incorporated does not provide any warranty, exprwarranties provided by Microchip Technology Incorporated and its subsiquotations, sales order acknowledgement, and invoices.						9.63		Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	1.25
Microchip disclaims any duty to notify users of updates or changes to Ma otherwise, suffered by users or third parties as a result of the users' relia of this Certificate of Compliance for semiconductor products.							Tin	7440-31-5	100.00	
								Total	100.00	

SO SI 28 SOIC 11:09 AM : 8/29/2013

ICROCHIP Semiconductor Device	e Type: SM, S2AE	08 (Lead) SOIC (208 mil) (C3/CD)		nation Base :	-		•	geneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			99.27	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm		, 0,			
Silica, vitreous	60676-86-0	Mold Compound	67.830	84.381	678,300		Silica, vitreous	60676-86-0	85.00 6.13	
Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	4.888 4.888	6.080	48,878 48,878		Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	2.432	19.551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	0.298	2.394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	12,479	100.314		Carbon Black	Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.307	2,468	13.06	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.249	2,000	13.06	Copper	7440-50-8	95.54	10.5
Zinc	7440-66-6	Lead Frame	0.200	0.249	131		Iron	7440-50-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.010	87		Silver	7439-69-6	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.700	5.625		Zinc	7440-22-4	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.131	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.070	563		Тисористово	Total	100.00	
Modified Amine	827-43-0	Die Attach	0.026	0.033	263	0.93	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	9.330	75.000	0.55	Silver (Ag)	7440-22-4	75	0.73
Doped Gold	7440-21-3	Wire Bond	0.200	0.249	2,000		Modified Epoxy Resin	13561-08-5	14	
					12.500	D	ialycidylether of bisphenol-F			
Tin										
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	1.555		D		54208-63-8	8	
semiconductor device and its homogenous materials c ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	0.1244 omply with EU Directive 20	TOTALS: g Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	100.000	124.400	1,000,000	9.33	Modified Amine (mg) Total	827-43-0 Total Chip (Die)	4 100.00 % of Total Weight	7.5
semiconductor device and its homogenous materials c tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified nemical substance is absent from the list above, the ch	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a	TOTALS: g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and,	100.000 S Recast Dire	124.400 ective) and wit	1,000,000		Modified Amine	827-43-0 Total	100.00	7.5
semiconductor device and its homogenous materials c tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Dilance with the above EU Directives has been verified the memical substance is absent from the list above, the porated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 flance.	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a coument, there is no credit y regulatory scheme world	TOTALS: g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, sile reason to believe that the unavoidable impurity concen	100.000 S Recast Directory to the best outration of the	124.400 ective) and wit f Microchip To chemical sub	1,000,000		Modified Amine (mg) Total	827-43-0 Total Chip (Die) 7440-21-3	4 100.00 % of Total Weight	7.5
semiconductor device and its homogenous materials c tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). bliance with the above EU Directives has been verified in the memical substance is absent from the list above, the chorated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 flavul.com/global/eng/pages/offerings/industries/chemical	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a comment, there is no credit y regulatory scheme world ammability standard for pla s/plastics/	TOTALS: g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, series and the reason to believe that the unavoidable impurity concentwide.	100.000 S Recast Dire to the best of the the state of the best of the best of the bottain a test of the bott	124.400 ictive) and with f Microchip To chemical subtreport at	1,000,000 th EU echnology stance, if	9.33	Modified Amine (mg) Total Doped Silicon	827-43-0 Total Chip (Die) 7440-21-3	4 100.00 % of Total Weight 100 100.00	
semiconductor device and its homogenous materials of tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified the interest of the date of this does not below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 flavul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Inchip Technology Incorporated believes the information ir original packing materials is true and correct to the lompleteness and accuracy of data in this form because lier information is often protected from disclosure as tree information is often protected from disclosure as the structure of the protected from the pr	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a ocument, there is no credit y regulatory scheme world amuability standard for pla s/plastics/ ped are made from polyvin n in this form concerning si best of its knowledge and b it has been compiled basi rade secrets and some info	TOTALS: g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concen- wide. Institute: You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho substances restricted by RoHS in Microchip Technology In belief, as of the date listed in this form. Microchip Technol ad on the ranges provided in Material Safety Data Sheets; urmation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	to the best of the	124.400 ctive) and wit f Microchip To chemical sub t report at g slip on the c semiconduct ated cannot g aw material si aw material si	1,000,000 th EU echnology stance, if outer box or devices uarantee uappliers. uppliers.	9.33	Modified Amine (mg) Total Doped Silicon (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond	4 100.00 % of Total Weight 100 100.00 % of Total Weight	
semiconductor device and its homogenous materials of tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified in the medical substance is absent from the list above, the chaporated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for any grompounds used by Microchip meet the UL94 V0 fix (ul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. In the properties of the properties and accuracy of data in this form because iter information is often protected from disclosure as treation is provided only as estimates of the average we de trace levels of dopants, metals, and non-metal materichip Technology Incorporated does not provide any welch	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a ocument, there is no credit y regulatory scheme world ambility standard for pla s/plastics/ ped are made from polyvin in this form concerning si best of its knowledge and it it has been compiled basi ade secrets and some info ight of these parts and the rials contained within silico arranty, express or implied arranty, express or implied	TOTALS: g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concen- wide. Institute: You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho substances restricted by RoHS in Microchip Technology In belief, as of the date listed in this form. Microchip Technol ad on the ranges provided in Material Safety Data Sheets; urmation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	to the best of the book of the	124.400 ective) and with the control of the control	1,000,000 th EU echnology stance, if outer box or devices uarantee uppliers. uppliers. do not product	9.33	Modified Amine (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	4 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	
semiconductor device and its homogenous materials of tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In proceedings of the date of this does not below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 fiz/vul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is ship ertain "reels" may be made from PVC plastic. Inchip Technology Incorporated believes the information if original packing materials is true and correct to the lompleteness and accuracy of data in this form because lier information is often protected from disclosure age we also the control of the provided only as estimates of the average we deterace levels of dopants, metals, and non-metal materichip Technology Incorporated does not provide any winties provided by Microchip Technology Incorporated tions, sales order acknowledgement, and invoices.	0.1244 omply with EU Directive 20 via internal design controls emical substance is NOT a ocument, there is no credit y regulatory scheme world ammability standard for pla s/plastics/ ped are made from polyvin n in this form concerning si oest of its knowledge and t e it has been compiled base rade secrets and some info ight of these parts and the rials contained within silico arranty, express or implied and its subsidiaries are co changes to Material Conten te users' reliance on the in	TOTALS: g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concen- wide. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concen- wide. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concen- wide. In intentional ingredient in the semiconductor devices with the unavoidable impurity concen- wide. In intentional ingredient in the semiconductor devices and the unavoidable in Microchip Technology In the intentional inten	to the best or tration of the potential of the packing corporated's ogy incorporated provided by remblers and reproduced to the packing of the packing corporated provided by remblers and reproduced to the packing of	f Microchip Tchemical subtreport at g slip on the cosemiconductated cannot gaw material si aw material see estimates usive, limited e provided in t, consequent	1,000,000 th EU echnology stance, if outer box or devices uarantee uppliers. uppliers. do not product Microchip's	9.33	Modified Amine (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total	4 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

SM S2AE 08 SOIC 11:09 AM: 8/29/2013

MICROCHIP Semiconductor Device Type	: S2AF 08/1/200	0 SOLI/SOIC 208in (4B)		ation Base A				geneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Commodituation Device Type	. OZAI OO (Lead	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	89.96	(mg) Total	Mold Compound	% ot Total Weight	66.29
Silica, vitreous	60676-86-0	Mold Compound	56.347	76.462	563,465		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.060	5.510	40,603		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide) Epoxy, Cresol Novolac	Trade Secret 29690-82-2	Mold Compound Mold Compound	4.060 1.624	5.510 2.204	40,603 16,241		Phenolic Resin Epoxy, Cresol Novolac	Trade Secret 29690-82-2	6.13 2.45	
Carbon Black	1333-86-4	Mold Compound	0.199	0.270	1.989		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	26.540	36.015	265,403		Calbon Black	Total		
Iron	7439-89-6	Lead Frame	0.653	0.886	6,528	37.70	(mg) Total	Lead Frame	% of Total Weight	27.78
Silver	7440-22-4	Lead Frame	0.529	0.718	5,292	07.70	Copper	7440-50-8	95.54	27.40
Zinc	7440-66-6	Lead Frame	0.035	0.047	347		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.023	0.031	229		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.163	0.221	1,628		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.044	0.060	440		Phosphorous	7723-14-0	0.08	
Metal oxide	Trade Secret	Die Attach	0.007	0.009	66			Total	100.00	
Gamma-butyrolactone	96-48-0	Die Attach	0.007	0.009	66	0.30	(mg) Total	Die Attach	% of Total Weight	0.22
Silicon	7440-21-3	Chip (Die)	5.410	7.341	54,100		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.150	0.204	1,500		Epoxy resin	Trade Secret	20	
Nickel	7440-02-0	Plating on external leads (pins)(PPF)	0.142	0.192	1,418		Metal oxide	Trade Secret	3	
Palladium	7440-05-03	Plating on external leads (pins)(PPF)	0.008	0.010	75		Gamma-butyrolactone	96-48-0	3	
Gold	7440-57-5	Plating on external leads (pins)(PPF)	0.001	0.001	8			Total		
		TOTALS:	100.000	135.700	1,000,000	7.34	Total (mg)	Chip (Die)	% of Total Weight	5.41
	0.1357 g	Total Mass					Doped Silicon	7440-21-3	100	
This semiconductor device and its homogenous materials comply birective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		,	•	st Directive) a	and with EU			Total		
Compliance with the above EU Directives has been verified via inte	rnal design controls,	supplier declarations, and /or analytical test data	a.			0.20	(mg) Total	Wire Bond	% of Total Weight	0.15
If a chemical substance is absent from the list above, the chemical Technology Incorporated's knowledge and belief as of the date of t chemical substance, if any, is not below the threshold of regulatory	his document, there i	s no credible reason to believe that the unavoid					Doped Gold	7440-57-5	100	
Molding compounds used by Microchip meet the UL94 V0 flammab http://ul.com/global/eng/pages/offerings/industries/chemicals/plast		tics. You can access the UL iQTM family of data	bases to obtain	a test report	at			Total	100.00	•
The protective "tubes" in which the specific product is shipped are box and certain "reels" may be made from PVC plastic.	made from polyvinyl	chloride (PVC) plastic. "Window envelopes" use	ed to hold the p	acking slip o	n the outer	0.20	(mg) Total	Plating on external leads (pins)(PPF)	% of Total Weight	0.15
Microchip Technology Incorporated believes the information in this devices in their original packing materials is true and correct to the guarantee the completeness and accuracy of data in this form becomaterial suppliers. Supplier information is often protected from disraw material suppliers. Information is provided only as estimates of These estimates do not include trace levels of dopants, metals, and	best of its knowledge ause it has been comp closure as trade secre f the average weight o	e and belief, as of the date listed in this form. Mi biled based on the ranges provided in Material S ets and some information may not have been pr If these parts and the average weight of anticipa	crochip Techno safety Data She ovided by subc ated significant	logy Incorpo ets provided ontract asser toxic metals	rated cannot by raw nblers and		Nickel	7440-02-0	94.50	
Microchip Technology Incorporated does not provide any warranty product warranties provided by Microchip Technology Incorporate in Microchip's quotations, sales order acknowledgement, and invoi	d and its subsidiaries						Palladium	7440-05-3	5.00	
Microchip disclaims any duty to notify users of updates or changes otherwise, suffered by users or third parties as a result of the users	s' reliance on the info						Gold	7440-57-5	0.50	
(SGS) or of this Certificate of Compliance for semiconductor produ	Cis.									

135.70

AICROCHIP Semiconductor Device	Type: S3AE 08 (La	ead) SOIC (208x 284in) (U4)		nation Base /				ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In" Sub-Component	% Total Weight			97.68	(mg) Total	Mold Compound	% ot Total Weight	71.98
Basic Substance	CAS Number	·	ŭ	mg/part	ppm			•	05.00	-
Silica, vitreous Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	61.183 4.409	83.025 5.983	611,830 44,088		Silica, vitreous Epoxy Resin	60676-86-0 Trade Secret	85.00 6.13	
Phenolic Resin	Trade Secret	Mold Compound	4.409	5.983	44,088		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.764	2.393	17.635		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.216	0.293	2,159		Carbon Black	1333-86-4	0.30	
Carbon Black	7440-50-8	Lead Frame	22.298	30.259	222.985		Carbon Black			!
			0.548					Total	100.00	
Iron	7439-89-6	Lead Frame	*****	0.744	5,485	31.67	(mg) Total	Lead Frame	% of Total Weight	23.34
Silver	7440-22-4	Lead Frame	0.445	0.603	4,446		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.029	0.040	292		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.019	0.026	193		Silver	7440-22-4	1.91	
Synthetic Rubber	308079-85-8	Die Attach	0.068	0.092	680		Zinc	7440-66-6	0.13	
Silica, vitreous	60676-86-0	Die Attach	0.060	0.081	595		Phosphorous	7723-14-0	80.0	
Solid Epoxy Resin	Trade Secret	Die Attach	0.021	0.029	213			Total	100.00	-
Phenol Resin	Trade Secret	Die Attach	0.021	0.029	213	0.23	(mg) Total	Die Attach	% of Total Weight	0.17
Silicon	7440-21-3	Chip (Die)	3.510	4.763	35,100		Synthetic Rubber	308079-85-8	40.00	****
Doped Gold	7440-57-5	Wire Bond	0.120	0.163	1,200		Silica, vitreous	60676-86-0	35.00	
		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.880	1.194	8,800		Solid Epoxy Resin	Trade Secret	12.50	
				1.194	0,000		SUIIU EPUXY RESIII			
Tin	1440 01 0			12E 700	4 000 000					
s semiconductor device and its homogenous materials co	0.1357 omply with EU Directive 20	TOTALS: q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	100.000	135.700 ective) and wi	1,000,000 th EU	4.76	Phenol Resin (mg) Total	Trade Secret Total Chip (Die)	12.50 100.00 % of Total Weight	3.51
is semiconductor device and its homogenous materials co ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v	0.1357 omply with EU Directive 20 ia internal design controls	TOTALS: Q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH, supplier declarations, and /or analytical test data.	100.000 S Recast Dire	ective) and wi	th EU	4.76	Phenol Resin	Trade Secret Total	12.50 100.00	3.51
s semiconductor device and its homogenous materials co active 2002/53/EC (End-of-Life Vehicles (ELV) Directive), npliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che proprated's knowledge and belief as of the date of this do	0.1357 Omply with EU Directive 20 ia internal design controls emical substance is NOT a cument, there is no credib	TOTALS: g Total Mass 02/95/EC (ROHS Directive), EU Directive 2011/65/EU (ROH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen	100.000 S Recast Director to the best o	ective) and wi	th EU	4.76	Phenol Resin (mg) Total	Trade Secret Total Chip (Die) 7440-21-3	12.50 100.00 % of Total Weight	3.51
semiconductor device and its homogenous materials co ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this dor is not below the threshold of regulatory concern for any thing compounds used by Microchip meet the UL94 V0 flar	0.1357 mply with EU Directive 20 ia internal design controls emical substance is NOT a cument, there is no credib regulatory scheme world- mmability standard for pla	TOTALS: q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide.	100.000 S Recast Director to the best outration of the	ective) and wi f Microchip T chemical sub	th EU	4.76 0.16	Phenol Resin (mg) Total	Trade Secret Total Chip (Die) 7440-21-3	12.50 100.00 % of Total Weight	3.51
s semiconductor device and its homogenous materials concive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified vehicles discovered the substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this down, is not below the threshold of regulatory concern for any idding compounds used by Microchip meet the UL94 V0 flator/clul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp	0.1357 omply with EU Directive 20 ia internal design controls emical substance is NOT a cument, there is no credib regulatory scheme world- mmability standard for pla s/plastics/	TOTALS: Q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to	100.000 S Recast Director to the best outration of the bootsin a test	ective) and wi	echnology ostance, if		Phenol Resin (mg) Total Doped Silicon	Trade Secret Total Chip (Die) 7440-21-3 Total	12.50 100.00 % of Total Weight 100 100.00	
is semiconductor device and its homogenous materials concective 2002/53/EC (End-of-Life Vehicles (ELV) Directive), impliance with the above EU Directives has been verified vehicles (see the vehicles of the date of this down, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 flapp://ul.com/global/eng/pages/offerings/industries/chemicals is protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information their original packing materials is true and correct to the becompleteness and accuracy of data in this form because popiler information is often protected from disclosure as traormation is provided only as estimates of the average weight.	0.1357 comply with EU Directive 20 ia internal design controls cument, there is no credib regulatory scheme world- iregulatory scheme world- immability standard for pla s/plastics/ led are made from polyvin in this form concerning si est of its knowledge and b it has been compiled base ade secrets and some info ght of these parts and the	Q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho ubstances restricted by RoHS in Microchip Technology In the ranges provided in Material Safety Data Sheets in mation may not have been provided by subcontract assea average weight of anticipated significant toxic metals con	to the best of tration of the booking a test of the packing corporated's ogy incorpor provided by remblers and removed.	f Microchip T chemical sub t report at g slip on the of semiconduct ated cannot g aw material s aw material s	echnology ostance, if outer box or devices puarantee uppliers.		Phenol Resin (mg) Total Doped Silicon (mg) Total	Trade Secret Total Chip (Die) 7440-21-3 Total Wire Bond	12.50 100.00 % of Total Weight 100 100.00 % of Total Weight	
is semiconductor device and its homogenous materials co	0.1357 comply with EU Directive 20 ia internal design controls emical substance is NOT a cument, there is no credib regulatory scheme world- mmability standard for pla s/plastics/ ed are made from polyvin- in this form concerning si est of its knowledge and the it has been compiled base ade secrets and some info ght of these parts and the lals contained within silicular curranty, express or implied and its subsidiaries are co	Q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho abstances restricted by RoHS in Microchip Technology In the lief, as of the date listed in this form. Microchip Technol do not he ranges provided in Material Safety Data Sheets in mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con and devices (silicon IC) in the finished parts. , with respect to the information provided in this declaration.	to the best of tration of the poblain a tes lid the packin corporated's logy Incorpor provided by remblers and remponents. The exclusion. The exclusions	f Microchip T chemical sub treport at g slip on the of semiconduct ated cannot g aw material s aw material s ese estimates	echnology ostance, if outer box or devices juarantee uppliers. s do not product		Phenol Resin (mg) Total Doped Silicon (mg) Total Doped Gold	Trade Secret	12.50 100.00 % of Total Weight 100 100.00 % of Total Weight	
semiconductor device and its homogenous materials co- ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified v hemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat //ul.com/global/eng/pages/offerings/industries/chemicals portective "tubes" in which the specific product is shipp pertain "reels" may be made from PVC plastic. Dohip Technology Incorporated believes the information eir original packing materials is true and correct to the b ompleteness and accuracy of data in this form because elier information is often protected from disclosure as tra mation is provided only as estimates of the average weig de trace levels of dopants, metals, and non-metal materi ochip Technology Incorporated does not provide any wa anties provided by Microchip Technology Incorporated a pochip's quotations, sales order acknowledgement, and in	0.1357 omply with EU Directive 20 ia internal design controls emical substance is NOT a cument, there is no credib regulatory scheme world- mmability standard for pla s/plastics/ led are made from polyving in this form concerning si est of its knowledge and it it has been compiled base ade secrets and some info ght of these parts and the ials contained within silico curranty, express or implied and its subsidiaries are co nvoices.	Q Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concenwide. stics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho abstances restricted by RoHS in Microchip Technology In the lief, as of the date listed in this form. Microchip Technol do not he ranges provided in Material Safety Data Sheets in mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con and devices (silicon IC) in the finished parts. , with respect to the information provided in this declaration.	to the best of the tothe best of the test	f Microchip T chemical sub t report at g slip on the of semiconduct ated cannot g aw material s aw material s ese estimates usive, limited e provided in	echnology ostance, if outer box or devices puarantee uppliers. suppliers of not product tial or	0.16	Phenol Resin (mg) Total Doped Silicon (mg) Total Doped Gold	Trade Secret Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	12.50 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	0.12

S3AE 08 SOIJ-S 11:09 AM: 8/29/2013

Semiconductor levice lype: CB and RB and TT 03 (Los) SOT-23 (Cit of Viri)	IICROCHIP				nation Base A pper Alloy (C	. ,			nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Produc Marking and/or Pkg. Labeling e3
Basic Substance	Semiconductor Device Type	e: CB and NB and TT	03 (Lead) SOT-23 (C6 / CV / M7)								es
State Stat			"Contained In"	% Total							
Siles, priesco 6007-8-0-0 Mold Compound 67-800 5-500 75-500 10-1	Basic Substance	CAS Number	Sub-Component	Weight	mg/part	mag	6.62	(mg) Total	Mold Compound	% ot Total Weight	79.8
Expos (Respi Mt Domain And Jaminory (Incode) Trade Secret Mod Compound 4,888 0,469 48,877 Permitted Respire (17, 10,502), but infringed Respire Mod Compound 4,888 0,409 48,877 Permitted Respire (17, 10,502), but infringed Respire Mod Compound 0,203 0,000 2,294 Permitted Respire (17, 10,502), but infringed Respire Mod Compound 0,203 0,000 2,294 Permitted Respire (17, 10,502), but infringed Respire (17, 10,502), but	Silica, vitreous	60676-86-0	Mold Compound	67.830		678.300		Silica, vitreous	60676-86-0	85.00	
Egosy, Created Nizorials								Epoxy Resin	Trade Secret	6.13	
Carbon Billion: 1333-864 Model Compound 0,299 0,000 2,904 0,000 2,904 0,000 2,004 0,000 2,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 7,005 0,005 0,007 0,005 0,005 0,005	Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.888	0.406	48,878		Phenolic Resin	Trade Secret	6.13	
Copper 7440-50-8 Load Frame 0.267 0.050 2.468 are registered 1.0531 0.533 10.314 control 1.0531 0.533 10.314 control 1.0531 0.533 10.314 control 1.0531 0.0531	Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	0.162	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Silver 7440-224 1. Lead Frame 0.247 0.050 2.468 087 (ms) Total Lead Frame 1.05 0.017 1.000 1.017 1.000 1.017 1.000 1.017 1.000 1.000 1.017 1.000 1.000 1.017 1.000	Carbon Black	1333-86-4	Mold Compound	0.239	0.020	2,394		Carbon Black	1333-86-4	0.30	
Sheer 7440-92-4 Least Frame 0.200 0.017 2.000 Procephorous 7740-946 1.000 1.31 1.000 1.31 Procephorous 7740-946 1.000 1.000 1.000 1.000 1.000 Procephorous 7740-946 1.000 1.000 1.000 1.000 1.000 1.000 Procephorous 7740-946 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 Procephorous 7740-946 1.000 1.00	Copper	7440-50-8	Lead Frame		0.833	100,314			Total	100.00	•
Procedures Type Color Procedures P	Iron	7439-89-6	Lead Frame	0.247	0.020	2,468	0.87	(mg) Total	Lead Frame	% of Total Weight	10.5
Phosphorous 1723-14-0 Lead Finance 0.009 0.001 877 Shert (An) 7440-224 De Altach 0.553 0.047 5.625 DM Modified Epox Retain 13651-08-5 De Altach 0.106-10-000 1.000	Silver	7440-22-4	Lead Frame	0.200	0.017	2,000		Copper	7440-50-8	95.54	
Silver (A) 7440-224 De Atlach 0.563 0.047 5.625 Modified Epony Repair 13651-055 De Atlanch 0.105 0.068 1.056	Zinc	7440-66-6	Lead Frame	0.013	0.001	131		Iron	7439-89-6	2.35	
Modified Epony Reain 1365 (1965 Die Attach Die O.056 Die Attach Die O.056 Die Attach Die O.056 Die Attach Die	Phosphorous	7723-14-0	Lead Frame	0.009	0.001	87		Silver	7440-22-4	1.91	
Diplyon/polytemer of bispheno-F 82/96-83-8 Die Attach 0.058 0.058 563 Modified Anne 82/74-91-9 Die Attach 0.058 0.058 0.050 283 Silicon 7440-91-3 Ohio (Table) Ohio (Tabl	Silver (Ag)	7440-22-4	Die Attach	0.563	0.047	5,625		Zinc	7440-66-6	0.13	
Silicon PAT-642-13 Chip (De) 7500 0.002 283 0.06 (mol Total De) 4 Match \$\$ \$4Total Weight 0.75 \$\$ \$3RC (De) \$\$ \$7500 0.003 7500 0.003 7500 0.003 7500 0.003 \$\$ \$4Total Weight 0.75 \$\$\$ \$4Total Weight 0.75 \$\$\$\$ \$4Total Weight 0.75 \$\$\$ \$4Total Weight 0.75 \$\$\$	Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.009	1,050		Phosphorous	7723-14-0	0.08	
Silcon 7440-21-3 Chip (Dib) 7,500 0,023 75,000 0,023 75,000 0,001 72,000 1,000	Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.005	563			Total	100.00	1
Silcon 7440-21-3 Chip (Dib) 7,500 0,023 75,000 0,017 2,000 1	Modified Amine	827-43-0	Die Attach	0.026	0.002	263	0.06	(mg) Total	Die Attach	% of Total Weight	0.75
Gold 7440-97-5 Wile Bond 174 O 2-00 0 1017 2,000 1 1 1 2,000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Silicon	7440-21-3	Chip (Die)	7.500	0.623	75.000					
The Total 1400-00 8-30 Total Mass 0.0083 g Total Mass 0.0084 g Total Mass 0.0084 g Total Mass 0.0094 g Total M				0.200	0.017	2.000				14	
O.0083 g Total Mass Comply with EU Directive 2002/39/EC (RoH3 Directive), EU Directive 2011/R5/EU (RoH3 Recast Directive) and with EU O.52 Total (mg) Chip (Die) % of Total Weight 7.5 Total 100.00 Total (mg) Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total 100.00 Total (mg) Total 100.00 Total	Tin	7440-31-5 Platin	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.104	12,500	Die	glycidylether of bisphenol-F	54208-63-8	8	
semiconductor device and its homogenous materials comply with EU Directive 20299/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU ive 2025/EC (End-of-Life Vehicles (ELV) Directive). Chip (Die)			TOTALS:	100.000	8.300	1,000,000		Modified Amine	827-43-0	4	
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU tive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). Doped Silicon Total (mg) Chip (Die) % of Total Weight 7.5		0.0083 a Ta	otal Mass						Total	100.00	1
Outcom/global/eng/pages/offerings/industries/chemicals/plastics/ rotective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and normal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated's semiconductor devices in retieness and accuracy of data in this form because it has been compiled based on the ranges provided by as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. chip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's annealed at 150°C for I annealed at 150°C for I annealed at 150°C for I hour I hou	ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		,	IS Recast Dire	ctive) and with	EU	0.62	T	,		7.5
n "reels" may be made from PVC plastic. Total 100.00 Tot	ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intended in the list above, the chemical substance is absent from the list above, the chemical orated's knowledge and belief as of the date of this docume	ernal design controls, sup al substance is NOT an int ent, there is no credible re	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer	, to the best of	Microchip Tec	hnology	0.62	T	7440-21-3	100	7.5
chip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the leteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier nation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information vided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. chip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product nities provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's of an interest of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or wise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or a Tin 7440-31-5 100.00 in the provided in Microchip's and a security of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or the case in the provided in Microchip's and the	tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via into the micro service of the chemical substance is absent from the list above, the chemical sorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regung compounds used by Microchip meet the UL94 V0 flamma	ernal design controls, sup al substance is NOT an int ent, there is no credible re ulatory scheme world-wide bility standard for plastics	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer .	, to the best of ntration of the	Microchip Tec	hnology		Doped Silicon	7440-21-3 Total	100	
titions, sales order acknowledgement, and invoices. chip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or wise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or S Certificate of Compliance for semiconductor products.	pliance with the above EU Directives has been verified via inthemical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regular compounds used by Microchip meet the UL94 V0 flamma //ul.com/global/eng/pages/offerings/industries/chemicals/plas	ernal design controls, sup al substance is NOT an int ent, there is no credible re latory scheme world-wide bility standard for plastics stics/	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer You can access the UL iQTM family of databases to	, to the best of ntration of the so obtain a test	Microchip Tec chemical subs report at	chnology tance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
	pliance with the above EU Directives has been verified via inthemical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flamma //ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped and in "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information in the original packing materials is true and correct to the best of it obleteness and accuracy of data in this form because it has be mation is often protected from disclosure as trade secrets are povided only as estimates of the average weight of these parts is of dopants, metals, and non-metal materials contained with	ernal design controls, sup- al substance is NOT an intent, there is no credible re- latory scheme world-wide bility standard for plastics stics/ re made from polyvinyl ch is form concerning substates knowledge and belief, a ven compiled based on the id some information may is and the average weight c in silicon devices (silicon y, express or implied, with	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to home the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of the date listed in this form. Microchip Technology Instruction of th	i, to the best of intration of the o obtain a test old the packing incorporated yided by raw in and raw mater hese estimate	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial suppliers. Ir s do not includ	ter box and devices in intee the errs. Supplier formation le trace	0.02	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.2
	citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via inthemical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flamma (ful.com/global/eng/pages/offerings/industries/chemicals/plasporotective "tubes" in which the specific product is shipped and in "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information in the original packing materials is true and correct to the best of it obleteness and accuracy of data in this form because it has be maded only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained with eachip Technology Incorporated does not provide any warrant anties provided by Microchip Technology Incorporated and it ations, sales order acknowledgement, and invoices. Dechip disclaims any duty to notify users of updates or change wise, suffered by users or third parties as a result of the use	ernal design controls, sup- al substance is NOT an intent, there is no credible re- elatory scheme world-wide bility standard for plastics stics/ re made from polyvinyl ch is form concerning substates knowledge and belief, a ten compiled based on the da some information may is and the average weight of in silicon devices (silicon y, express or implied, with s subsidiaries are contain	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to he nees restricted by RoHS in Microchip Technology In sof the date listed in this form. Microchip Technology ranges provided in Material Safety Data Sheets provot have been provided by subcontract assemblers a f anticipated significant toxic metals components. TIC) in the finished parts. In respect to the information provided in this declarated in Microchip's standard terms and conditions of standards and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations are shall not be liable for any damages, diarations are shall not be liable for any damages, diarations are shall not be liable for any damages, diarations are shall not be liable for any damages, diarations are shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages.	i, to the best of intration of the co obtain a test old the packing incorporated's a gy Incorporate vided by raw n and raw mater hese estimate	Microchip Tecchemical subs report at slip on the ou semiconductor d cannot guara aterial supplie al suppliers. Ir s do not includ sive, limited pr p provided in M	ter box and devices in the theorem in the the the trace toduct dicrochip's	0.02	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.2

CB NB TT 3 SOT-23 11:10 AM : 8/29/2013

Basic Substance	AICROCHIP Semiconductor Davice Turn	N CT . OT 05	** * * * * * * * * * * * * * * * * * *		nation Base A pper Alloy (C				nogeneous Materials: (e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	Semiconductor Device Type	E Cland OI U5	` '								es
Principal Resemble (1997)	Basic Substance	CAS Number			mg/part	ppm	9.42	(mg) Total	Mold Compound	% ot Total Weight	63.21
Photocoline											
Epoxy Created Norolacy 2600-082-21 Model Compound 1,5480 0,231 15,486											
Carbon Black											
Copper											
Iron								Carbon Black			
Silver 17440-96-6 Leaf Frame 0.035 0.060 5.391											
Principhorous 7723-14-0 Lead Frame 0.035 0.005 254	-					-,	4.22				28.3
Prosphorous 7723-14-0 Lead Frame 0.023 0.003 233 0.003 233 0.003 233 0.003 233 0.003 1233 0.003 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 1233 0.003 0											
Metal coads Trade Secret Die Attach 0.845 0.128 8.448 Epoxy resires Trade Secret Die Attach 0.845 0.126 8.449 Freephroats 77744 0.00 Freephr											
Epory resins Trade Secret Die Attach 0.845 0.128 8.448											
Give of theres Trade Secret Die Attach O.230 Curring / Hardener Trade Secret Die Attach O.230 O.334 Silicon Trade Secret Die Attach O.230 O.341 Trade Secret Die Attach O.230 O.342 O.344 O.3457.5 Die (Die) O.3470.0 Trade Secret O.3470.0 Trade Secret O.340 O.340 Trade Secret O.340 O.340 Trade Secret O.340 O.340 Trade Secret O.340 O											
Curing / Hardener Trade Secret Die Attach Q.230 0.034 2.304 0.38 mg Total Die Attach % of Total Weight 2.56						-, -		Phosphorous			
Silicon 7440/21-3 Chip (Dia) 3.170 A-72 31700 A-72 3170											
Gold T440-57-5 Wire Bond Tin 1740-511-5 Plang on external lase (pms). Mater Tin 1740-51-5 Plang on external lase (pms). Mater Tin 1740-51-5 Plang on external lase (pms). Mater Tin 1740-51-5 Plang on external la							0.38	(mg) Total	Die Attach	% of Total Weight	2.56
HANA / Material compliation	Silicon	7440-21-3	Chip (Die)	3.170	0.472	31,700		Metal oxide	Trade Secret	33	
HANA / Material compilation 0.014 g Total Mass Total 100.000 14.90 1,000,000 Total Weight 0.74 Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (mg) Total (mg) Total (mg) Chip (Die) % of Total Weight 0.74 Total (mg) Total (m	Gold	7440-57-5	Wire Bond	0.740	0.110	7,400		Epoxy resins	Trade Secret	33	
HANA / Material compilation	Tin	7440-31-5 P	lating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.020	0.301	20,200		Glycol ethers	Trade Secret	25	
Semiconductor device and its homogenous materials comply with EU Directive 20278/EC (RoHS Directive). EU Directive 2017/85/EU (RoHS Recast Directive) and with EU Use 20253/EC (End-of-Life Vehicles (ELV) Directive). International devices and the homogenous materials comply with EU Directive 20278/EC (RoHS Directive). EV Directive 2017/85/EC (RoHS Directive). EV Directive 2017/85/EU (RoHS Recast Directive) and with EU Directive 2017/85/EC (RoHS Directive). EV Directive 2017/85/EC (RoHS Directive). EV Directive 2017/85/EU (RoHS Recast Directive) and with EU Directive 2017/85/EC (RoHS Directive). EV Directive 2017/85/EU (RoHS Recast Directive) and with EU Directive 2017/85/EU (RoHS Directive). EV Directive 2017/85/EU (RoHS Recast Directive) and with EU Directive 2017/85/EU (RoHS Recast Directive) and the EU Directive 2017/85/EU (RoHS Recast Direc			TOTALS:	100.000	14.900	1,000,000		Curing / Hardener	Trade Secret	9	
portated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Ing compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at Vul.com/global/eng/pages/offerings/industries/chemicals/plastics/ Protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and in "reles" may be made from PVC plastic. Total 100.00 Total Wire Bond % of Total Weight 0.74 Doped Gold 7440-57-5 100							0.47	Total (mg)	Chip (Die)	% of Total Weight	3.17
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ain "reels" may be made from PVC plastic. Doped Gold T440-57-5 100	•	,					0.47		7440-21-3	100	
in "reels" may be made from PVC plastic. Doped Gold 7440-57-5 100.00	hemical substance is absent from the list above, the chemica porated's knowledge and belief as of the date of this docume	I substance is NOT an	intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity conce				0.47		7440-21-3	100	
orbip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the obleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information povided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace is of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. The exclusive, limited product anties provided by Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product anties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's actions, sales order acknowledgement, and invoices. The exclusive, limited product and incrochip's action of the information in Microchip's standard terms and conditions of sale. These are provided in Microchip and incrochip's action of the provided in Microchip deads (pins) - Matter Tin / Annealed at 150°C for any damages, direct or indirect, consequential or wise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or a material suppliers. Information in Material Suppliers. Information in Material Suppliers. The pl	hemical substance is absent from the list above, the chemica porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regu ing compounds used by Microchip meet the UL94 V0 flammal	I substance is NOT an nt, there is no credible latory scheme world-v bility standard for plas	intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity conce vide.	ntration of the	chemical subs			Doped Silicon	7440-21-3 Total	100	
anties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's ations, sales order acknowledgement, and invoices. ochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or is Certificate of Compliance for semiconductor products.	. hemical substance is absent from the list above, the chemica rporated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regu ling compounds used by Microchip meet the UL94 V0 flammal //ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar	I substance is NOT an nt, there is no credible latory scheme world-v bility standard for plas tics/	intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity conce vide. tics. You can access the UL iQTM family of databases to	ntration of the	chemical subs	tance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
erwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line (SGS) or	chemical substance is absent from the list above, the chemical properties of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal ci/ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped at ain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this roriginal packing materials is true and correct to the best of it pleteness and accuracy of data in this form because it has be immation is often protected from disclosure as trade secrets an rovided only as estimates of the average weight of these parts	I substance is NOT an nt, there is no credible latory scheme world-v bility standard for plas tics/ e made from polyvinyl s form concerning sul s knowledge and belie en compiled based on d some information m and the average weig and the average weig	intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to be estances restricted by RoHS in Microchip Technology In f., as of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets proynot have been provided by subcontract assemblers to fanticipated significant toxic metals components. In	ntration of the cooking a test old the packing accorporated's segy Incorporate vided by raw nand raw material	report at slip on the ou semiconductor d cannot guara taterial supplie	tance, if ter box and devices in untee the ers. Supplier uformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
Total 100.00	hemical substance is absent from the list above, the chemical rorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flammal (ful. com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar ain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information in thi original packing materials is true and correct to the best of it pleteness and accuracy of data in this form because it has be mation is often protected from disclosure as trade secrets an ovided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained with ochip Technology Incorporated does not provide any warrant anties provided by Microchip Technology Incorporated and its	I substance is NOT annt, there is no credible latory scheme world-vibility standard for plastics/ e made from polyvinyl s form concerning sul s knowledge and belie en compiled based on d some information m and the average weig in silicon devices (silic y, express or implied,	intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to be estances restricted by RoHS in Microchip Technology In f, as of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets proynot have been provided by subcontract assemblers that of anticipated significant toxic metals components. Toon IC) in the finished parts. with respect to the information provided in this declarated.	ntration of the oo obtain a test old the packing neorporated's a gy Incorporate vided by raw nand raw materichese estimate:	report at slip on the outsemiconductor d cannot guaraterial supplie al suppliers. Ir s do not including the control of the con	ter box and devices in intee the ers. Supplier information te trace	0.11	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100	0.74
	hemical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulation in grompounds used by Microchip meet the UL94 V0 flammal /ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar in "reels" may be made from PVC plastic. In the protection of the prote	Il substance is NOT annt, there is no credible latory scheme world-vibility standard for plastics/ e made from polyvinyl s form concerning suls knowledge and belie en compiled based on d some information m and the average weig in silicon devices (silic y, express or implied, s subsidiaries are contest to Material Content is to Material Content	intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he destances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology Inf. are the date listed in this form. Microchip Technology Inf. are the date listed in this form. Microchip Technology Inf. are the date listed in this form. Microchip Technology Inf. are the date in the form. Microchip Technology Inf. are the date in the form. Microchip Technology Inf. are the date in the form. Microchip Technology Inf. are the date in the finished parts. With respect to the information provided in this declaration in Microchip's standard terms and conditions of Declarations and shall not be liable for any damages, di	ntration of the oo obtain a test old the packing ncorporated's segy Incorporate vided by raw n and raw materi hese estimate:	report at slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pl p provided in N c, consequentia	ter box and devices in intee the ers. Supplier information le trace	0.11	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.74

CT OT 5 SOT-23 11:10 AM : 8/29/2013

ЛІСПОСНІР				nation Base opper Alloy (0				ogeneous Materials: .g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Devic	e Type: CT and OT 05 (Lead									e3
		"Contained In"	% Total			12.77	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	12.77	(mg) i otai	wola Compouna	% of Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	67.830	10.853	678,300		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.888	0.782	48,878		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin	Trade Secret	Mold Compound	4.888	0.782	48,878		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	0.313	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	0.038	2,394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	1.605	100,314			Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.039	2,468	1.68	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.032	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.002	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.001	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.090	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.017	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.009	563			Total	100.00	
Modified Amine	827-43-0	Die Attach	0.026	0.004	263	0.12	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	1.200	75,000		Silver (Ag)	7440-22-4	75	
Doped Gold	7440-57-5	Wire Bond	0.200	0.032	2,000		Modified Epoxy Resin	13561-08-5	14	
Tin	7440-31-5 Plating o	n external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.200	12.500	D	ialycidylether of bisphenol-F	54208-63-8	8	
s semiconductor device and its homogenous materials of				16.000 ective) and wit	1,000,000	1.20	Modified Amine (mg) Total	827-43-0 Total	4 100.00 % of Total Weight	7.5
s semiconductor device and its homogenous materials of active 2002/53/EC (End-of-Life Vehicles (ELV) Directive). In pliance with the above EU Directives has been verified chemical substance is absent from the list above, the cl	comply with EU Directive 2002/95/E	al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoH er declarations, and /or analytical test data.	IS Recast Dire	ective) and wit	1,000,000 th EU	1.20	Modified Amine	827-43-0 Total	100.00	7.5
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified	comply with EU Directive 2002/95/Ei via internal design controls, suppli- nemical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide.	al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. Ional ingredient in the semiconductor device and n to believe that the unavoidable impurity concerns.	IS Recast Dire	ective) and wit f Microchip To chemical sub	1,000,000		Modified Amine (mg) Total Doped Silicon	827-43-0 Total Chip (Die) 7440-21-3	4 100.00 % of Total Weight 100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the ci orporated's knowledge and belief as of the date of this d i, is not below the threshold of regulatory concern for an Iding compounds used by Microchip meet the UL94 V0 fl o://ul.com/global/eng/pages/offerings/industries/chemica	comply with EU Directive 2002/95/Et via internal design controls, supplinemical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. Immability standard for plastics. Y Is/plastics/	al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHs declarations, and /or analytical test data. ional ingredient in the semiconductor device and in to believe that the unavoidable impurity concernous can access the UL iQTM family of databases to	IS Recast Direct, to the best on tration of the obtain a test	ective) and wit f Microchip To chemical sub t report at	1,000,000 th EU echnology ostance, if	0.03	Modified Amine (mg) Total Doped Silicon (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond	4 100.00 % of Total Weight 100 100.00 % of Total Weight	7.5
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the ct orporated's knowledge and belief as of the date of this d i, is not below the threshold of regulatory concern for an Iding compounds used by Microchip meet the UL94 V0 fi	comply with EU Directive 2002/95/Et via internal design controls, supplinemical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. Immability standard for plastics. Y Is/plastics/	al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHs declarations, and /or analytical test data. ional ingredient in the semiconductor device and in to believe that the unavoidable impurity concernous can access the UL iQTM family of databases to	IS Recast Direct, to the best on tration of the obtain a test	ective) and wit f Microchip To chemical sub t report at	1,000,000 th EU echnology ostance, if		Modified Amine (mg) Total Doped Silicon	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	4 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100 100 100 100 100 100 100 100 10	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the ci orporated's knowledge and belief as of the date of this d r, is not below the threshold of regulatory concern for an iding compounds used by Microchip meet the UL94 V0 fl p://ul.com/global/eng/pages/offerings/industries/chemica	comply with EU Directive 2002/95/Ei via internal design controls, supplication and internal design controls, supplication and internal design controls, supplication and internal design a	al Mass C (RoHS Directive), EU Directive 2011/65/EU (Roher declarations, and /or analytical test data. Ional ingredient in the semiconductor device and in to believe that the unavoidable impurity concernou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to help the construction of the date listed in this form. Microchip Technology Information of the date listed in Material Safety Data Sheets may not have been provided by subcontract assimaly not have been provided by subcontract assimaly not have been provided by subcontract assimaly not an ended to significant toxic metals contract assimaly not an ended to significant toxic metals contract assimaly not accept the contract assimaly not accept the contract assimaly not have been provided by subcontract assimaly not accept the contract assimaly not accept the contract as see the contract as a contr	IS Recast Dire to the best o ntration of the o obtain a tes old the packing ncorporated's logy incorpor- provided by r emblers and r	f Microchip To chemical sub t report at g slip on the c semiconduct ated cannot g aw material si	th EU echnology stance, if outer box or devices uarantee uppliers. uppliers.		Modified Amine (mg) Total Doped Silicon (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond	4 100.00 % of Total Weight 100 100.00 % of Total Weight	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this dr., is not below the threshold of regulatory concern for an iding compounds used by Microchip meet the UL94 V0 flo-z'ul.com/global/eng/pages/offerings/industries/chemicale protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information heir original packing materials is true and correct to the completeness and accuracy of data in this form becaus polier information is often protected from disclosure as a termation is provided only as estimates of the average we	via internal design controls, suppli- via internal design controls, suppli- nemical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. ammability standard for plastics. Y Is/plastics/ pped are made from polyvinyl chlori- n in this form concerning substance best of its knowledge and belief, as e it has been compiled based on the rade secrets and some information eight of these parts and the average trials contained within silicon device farranty, express or implied, with re	al Mass C (RoHS Directive), EU Directive 2011/65/EU (Roher declarations, and /or analytical test data. Ional ingredient in the semiconductor device and in to believe that the unavoidable impurity concerts out can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to he restricted by RoHS in Microchip Technology Ir of the date listed in this form. Microchip Technology Ir of the date listed in this form. Microchip Technology Ir and the week provided in Material Safety Data Sheets may not have been provided by subcontract ass weight of anticipated significant toxic metals coles (silicon IC) in the finished parts. spect to the information provided in this declarat	to the best on tration of the oobtain a test old the packing accorporated's logy incorporprovided by remblers and remplers and remponents. The	f Microchip Tochemical subtreport at g slip on the common subtreport at g semiconductated cannot g aw material seese estimates	1,000,000 th EU echnology pstance, if outer box or devices uarantee uppliers. uppliers. do not product		Modified Amine (mg) Total Doped Silicon (mg) Total	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	4 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100 100 100 100 100 100 100 100 10	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this dr., is not below the threshold of regulatory concern for an iding compounds used by Microchip meet the UL94 V0 floc/lul.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" in the specific product is ship a certain "reels" may be made from PVC plastic. Protective "tubes" in which the specific product is ship a certain "reels" may be made from PVC plastic.	via internal design controls, suppli- via internal design controls, suppli- nemical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. lammability standard for plastics. Y lis/plastics/ pped are made from polyvinyl chlori in in this form concerning substance best of its knowledge and belief, as e it has been compiled based on the rade secrets and some information light of these parts and the average rials contained within silicon device varranty, express or implied, with re and its subsidiaries are contained changes to Material Content Declars he users' reliance on the informatio	al Mass C (RoHS Directive), EU Directive 2011/65/EU (Roher declarations, and /or analytical test data. Identifying the semiconductor device and in to believe that the unavoidable impurity concerts out can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to he describe the semiconductor of the database of the datab	is Recast Direction of the best on the best of the bes	f Microchip To chemical sub- treport at g slip on the co semiconductated cannot g aw material si aw material si ese estimates	1,000,000 th EU echnology stance, if outer box or devices uarantee uppliers. uppliers. do not product Microchip's	0.03	Modified Amine (mg) Total Doped Silicon (mg) Total Doped Gold	827-43-0 Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	4 100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

CT OT 05-SOT-23 11:10 AM: 8/29/2013

Sale Substance CAS Number Sub-Component Weight mg/part ppm 8.39 (mg) Total Mod Compound 4.1673 7.136 419.70 Floor 1.000 Floor	MICROCHIP Semiconductor Device Tur	OT 05 # 1	COT 22 ave		nation Base A				nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	Semiconductor Device Typ	DE: OI US (Lead)		0/ Total	1				1		es
Eppory Resun Trans Secret Figure Trans Secret	Basic Substance	CAS Number			mg/part	ppm	8.39	(mg) Total	Mold Compound	% ot Total Weight	49.38
Phenoid Resent No. Br. CT. SSOS.3 No distintnony risolated Trade Secret Modi Compound 1,210 0.006 1,208								,			
Egony_Cress Novolucian 2889-95-22 Model Compound 1216 0.286 1.208											
Carbon Black											
Copper 7449-59-8 Lead Frame 40-919 6.956 49-9167 749-100-68 149-916 14											
Silver (744-22-4 Leaf Farme 0.816 0.39 8,159 200 0.000								Carbon Black			<u> </u>
Silver 7440-22-4 Lead Frame 0.016 0.039 159 200 555 200 555 200 200 200 200 200 200											
Time							7.28	(mg) Total			42.83
Phosphorous 7723-14-0 Lead Frame 0.035 0.006 353											
Aluminum oxide Secord Total Secret De Attach De Attach D. 138 D. 1,059											
Export resim Trade Secret Die Attach 0.193 0.193 1.925 Final National Part 1.925 Final Part								•			
Amine (Trade Secret - 10039) Trade Secrets Die Attach 0.012 0.002 116 180 18											
Silicon P7440-27-3 Chip (Dile) 4.380 0.745 4.3800 0.95 (ma) Total Del Attach No.47-5 1.00 (Dile) 7.440-37-5 Wire Bond 1.04-07-5 1.00 (Dile) 1.00 (Dile						, , , , ,		Phosphorous			<u> </u>
Gold 7440-57-5 Wire Bond Tin 7440-51-5 Pitting metical states (prais-likels first parameter at 150°C cert hook 2.070 0.430 0.073 4.300 Exposyresis Trade Secret 1.003 4 100.00 17.000 1.000,000 17.000 17.000 1.000,000 17.000 17.000 1.000,000 17.000									Total		
Tin 744031-5 Patrs on extensive lasts [proj. Mates Tn/ Americals at 150°Ctor1 Into 100,000 170 0, 100,000 170 0			- 1 \ -7		****		0.05			% of Total Weight	0.31
15 semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU 15 semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU 15 carbon device (ELO) Directive). 15 carbon devices (ELV) Directive). 15 carbon devices (ELV) Directive). 15 carbon devices (ELV) Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 15 carbon devices and its above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 15 carbon devices and its above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 15 carbon devices and its above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 16 carbon devices and its above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 16 carbon devices and its above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 17 carbon devices and internal design controls design declarations, and /or analytical test data. 18 carbon devices and internal design controls design declarations, and /or analytical test data. 18 carbon devices and internal design controls declaration and with the above EU Directives has been verified as a often date of this declaration of the chemical substance; if violation devices and test report at the chemical substance; if violation devices and the chemical substance; if violation devices and test report at the chemical substance; if violation devices and test report at the chemical substance; if violation devices and test data. 18 carbon devices design devices design devices design devices design devi											
0.0170 g Total Mass O.0170 g	Tin	7440-31-5								62	
Sist Semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). 1. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials are contained with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). 1. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with the above EU Directive shas been verified via internal design controls, supplier declarations, and /or analytical test data. 2. Doped Silicon 7.440-21-3 100. 2. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive shas been verified via internal design controls, supplier declarations, and /or analytical test data. 2. Doped Silicon 7.440-21-3 100. 3. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Precive). 3. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Precive). 4. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Precive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Precive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/85/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight 4.38 monitorials with EU Directive 2014/86/EU (RoHS Directive). 5. Total (mg) Chip (Die) % of Total Weight			TOTALS:	100.000	17.000	1,000,000	Ami	ine (Trade Secret - 10039)			
his semiconductor devices and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 0.74 Total (mg) Chip (Die) % of Total Weight 4.38 Doped Silcon 7440-21-3 100.00 Total 100.00		0.0170	g Total Mass						Total	100.00	
proporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. 0.07					·		0.74	Total (mg)	Chip (Die)	% of Total Weight	4.38
tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ terrotective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and retain "reels" may be made from PVC plastic. Total 100.00	ompliance with the above EU Directives has been verified via in	•		I to the hest of	Microchin Te		0.74	,	7440-21-3	100	
Intain "reels" may be made from PVC plastic. Introchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in eir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the impleteness and accuracy of data in this form because it has been compiled based on the ranges provided by subcontract assemblers and raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Interception Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's underconduct of the provided in Microchip's of Total Weight 2.67 in the provided of the provided o	ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum	al substance is NOT ent, there is no credi	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce			chnology	0.74	,	7440-21-3	100	
icrochip Technology Incorporated believes the information in this form concerning substances restricted by ROHS in Microchip Technology Incorporated semiconductor devices in eiro riginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the empleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. Plating on external leads (pins) - Matte Tin / annealed at 150°C for / annealed at 150°	ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum by, is not below the threshold of regulatory concern for any region olding compounds used by Microchip meet the UL94 VO flamma	al substance is NOT ent, there is no credi ulatory scheme work ability standard for p	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	ntration of the	chemical subs	chnology		Doped Silicon	7440-21-3 Total	100	
arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's outsiding a provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's outside the provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's outside the provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's outside the provided in M	ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic acorporated's knowledge and belief as of the date of this documny, is not below the threshold of regulatory concern for any region in the compounds used by Microchip meet the UL94 V0 flammattp://ul.com/global/eng/pages/offerings/industries/chemicals/plahe protective "tubes" in which the specific product is shipped a	al substance is NOT ent, there is no credi ulatory scheme work ability standard for p stics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce 1-wide. astics. You can access the UL iQTM family of databases	ntration of the	chemical subs	chnology stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.43
herwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third party test reports (compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic acorporated's knowledge and belief as of the date of this documny, is not below the threshold of regulatory concern for any region to the state of the	al substance is NOT ent, there is no credi ulatory scheme work ability standard for p stics/ are made from polyviants form concerning s its knowledge and be een compiled based nd some information s and the average we	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in the control of the	ntration of the to obtain a test old the packing ncorporated's: gy Incorporate wided by raw n and raw materi	report at g slip on the out semiconducto d cannot guar- naterial supplical suppliers. I	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.43
Total 100.00	compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic acorporated's knowledge and belief as of the date of this documny, is not below the threshold of regulatory concern for any region loiding compounds used by Microchip meet the UL94 V0 flammattp://ul.com/global/eng/pages/offerings/industries/chemicals/plambe protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the reir original packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets at provided only as estimates of the average weight of these particular of the protection of the protection of the provide and with licrochip Technology Incorporated does not provide any warran	al substance is NOT ent, there is no credi ulatory scheme work ability standard for p stics/ are made from polyvia his form concerning s its knowledge and be een compiled based nd some information s and the average we hin silicon devices (s tty, express or implie	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in the control of the	ntration of the to obtain a test old the packing ncorporated's: gy Incorporate vided by raw nand raw mater 'hese estimate tion. The exclu	report at g slip on the out semiconducto d cannot guar naterial suppliers. It is do not includ sive, limited p	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace roduct	0.07	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.43
	ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic icorporated's knowledge and belief as of the date of this documny, is not below the threshold of regulatory concern for any region of the compounds used by Microchip meet the UL94 V0 flammattp://ul.com/global/eng/pages/offerings/industries/chemicals/plathe protective "tubes" in which the specific product is shipped a entain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the reir original packing materials is true and correct to the best of information is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these partivels of dopants, metals, and non-metal materials contained with licrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and i uotations, sales order acknowledgement, and invoices.	al substance is NOT ent, there is no credi ulatory scheme work ability standard for pi stics/ ure made from polyvi nis form concerning s its knowledge and be een compiled based nd some information s and the average we hin silicon devices (s ty, express or implie ts subsidiaries are co	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concell-wide. lastics. You can access the UL iQTM family of databases the provide of the p	ntration of the to obtain a test old the packing incorporated's gy incorporate vided by raw in and raw mater' hese estimate tion. The exclusiale. These are irect or indirect or indirect or indirect or indirect or indirect.	report at g slip on the out semiconducto d cannot guar- naterial suppli- ial suppliers. It s do not includes ive, limited p e provided in N t, consequenti	chnology stance, if uter box and r devices in antee the erns. Supplier nformation de trace roduct hicrochip's	0.07	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 7440-31-5	100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	2.67

OT 5 SOT-23 11:10 AM : 8/29/2013

MICROCHIP Somicon duntos Davies Tim	01 OT	207.00		nation Base A	. ,			nogeneous Materials: (e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Typ	e: CH and OI									e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	13.57	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	67.830	11.531	678,300		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.888	0.831	48,878		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.888	0.831	48,878		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	0.332	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	0.041	2,394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	1.705	100,314			Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.042	2,468	1.79	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.034	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.002	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.001	87		Silver	7440-22-4	1.91	
Epoxy resin	Trade Secret	Die Attach	0.338	0.057	3,375		Zinc	7440-66-6	0.13	
Silicon dioxide	Trade Secret	Die Attach	0.338	0.057	3,375		Phosphorous	7723-14-0	0.08	
Curing / Hardener	Trade Secret	Die Attach	0.075	0.013	750		,	Total	100.00	•
Silicon	7440-21-3	Chip (Die)	7.500	1.275	75,000	0.13	(mg) Total	Die Attach	% of Total Weight	0.75
Gold	7440-57-5	Wire Bond	0.200	0.034	2,000		Epoxy resin	Trade Secret	45	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.213	12,500		Silicon dioxide	Trade Secret	45	
		TOTALS:	100.000	17.000	1,000,000		Curing / Hardener	Trade Secret	10	
	0.0170	g Total Mass						Total	100.00	1
This semiconductor device and its homogenous materials comply Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	,	, , , , , , , , , , , , , , , , , , , ,	IS Recast Direc	ctive) and with	EU	1.28	Total (mg)	Chip (Die)	% of Total Weight	7.5
Compliance with the above EU Directives has been verified via in	ternal design contro	s, supplier declarations, and /or analytical test data.					Doped Silicon	7440-21-3	100	
If a chemical substance is absent from the list above, the chemic- incorporated's knowledge and belief as of the date of this docum- any, is not below the threshold of regulatory concern for any regu Molding compounds used by Microchip meet the UL94 V0 flamma	ent, there is no credi ulatory scheme work	ible reason to believe that the unavoidable impurity concerd-wide.						Total	100.00	
			o obtain a test	report at	ľ					
		·		•		0.03	(mg) Total	Wire Bond	% of Total Weight	0.2
http://ul.com/global/eng/pages/offerings/industries/chemicals/pla: The protective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic.		·		•	iter box and	0.03	(mg) Total Doped Gold	7440-57-5	100	0.2
The protective "tubes" in which the specific product is shipped a	re made from polyving state form concerning state knowledge and been compiled based and some informations and the average we	nyl chloride (PVC) plastic. "Window envelopes" used to ho substances restricted by RoHS in Microchip Technology Ir elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro unay not have been provided by subcontract assemblers is eight of anticipated significant toxic metals components. T	old the packing ncorporated's s gy Incorporated ovided by raw m and raw materi	slip on the outer semiconductor d cannot guara aterial supplie al suppliers. In	r devices in antee the ers. Supplier nformation	0.03	I			0.2
The protective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in th their original packing materials is true and correct to the best of i completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as is provided only as estimates of the average weight of these part:	re made from polyving is form concerning to the knowledge and be seen compiled based and some information is and the average within silicon devices (sty, express or implied.	nyl chloride (PVC) plastic. "Window envelopes" used to ho substances restricted by RoHS in Microchip Technology Ir elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers in eight of anticipated significant toxic metals components. T illicon IC) in the finished parts.	old the packing ncorporated's s gy Incorporated vided by raw m and raw materi These estimates tion. The exclus	slip on the outering size of the outering size outering size of the outering size of the outering size outering size outering size outering size outering size outering size oute	r devices in antee the ers. Supplier nformation de trace	0.03	I	7440-57-5	100	1.25
The protective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in th their original packing materials is true and correct to the best of i completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as is provided only as estimates of the average weight of these partilevels of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warran warranties provided by Microchip Technology Incorporated and it	re made from polyvii sis form concerning to to knowledge and be een compiled based and some information s and the average w nin silicon devices (s ty, express or implie ts subsidiaries are co	nyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets proving may not have been provided by subcontract assemblers elight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. Id, with respect to the information provided in this declarated ontained in Microchip's standard terms and conditions of the contract of	old the packing ncorporated's s gy Incorporated voided by raw m and raw materi These estimates ttion. The exclus sale. These are	slip on the outline semiconductor of diamont guaraterial suppliers. It is do not include sive, limited provided in Marconsequentia.	r devices in antee the ers. Supplier nformation de trace roduct dicrochip's		Doped Gold	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100	
The protective "tubes" in which the specific product is shipped a certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in their original packing materials is true and correct to the best of is completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as is provided only as estimates of the average weight of these partievels of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warrant warranties provided by Microchip Technology incorporated and it quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or chang otherwise, suffered by users or third parties as a result of the use	re made from polyvii sis form concerning to to knowledge and be een compiled based and some information s and the average w nin silicon devices (s ty, express or implie ts subsidiaries are co	nyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets proving may not have been provided by subcontract assemblers elight of anticipated significant toxic metals components. Tillicon IC) in the finished parts. Id, with respect to the information provided in this declarated ontained in Microchip's standard terms and conditions of the contract of	old the packing ncorporated's s gy Incorporated voided by raw m and raw materi These estimates ttion. The exclus sale. These are	slip on the outline semiconductor of diamont guaraterial suppliers. It is do not include sive, limited provided in Marconsequentia.	r devices in antee the ers. Supplier nformation de trace roduct dicrochip's		Doped Gold (mg) Total	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour.	100 100.00 % of Total Weight	

CH OT 6 SOT-23 NC 11:10 AM : 8/29/2013

AICROCHIP				nation Base A oper Alloy (C	- ,		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	e Type: OT 06 (Lead) SO	T-23 (6A)								e4
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	7.94	(mg) Total	Mold Compound	% ot Total Weight	48.26
Silica, vitreous (or fused)	60676-86-0	Mold Compound	41.021	6.748	410,210		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.199	0.691	41,986		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	2.896	0.476	28,956		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.145	0.024	1,448		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	48.319	7.949	483,192			Total	100.00	
Iron	7439-89-6	Lead Frame	1.142	0.188	11,422	8.17	(mg) Total	Lead Frame	% of Total Weight	49.66
Phosphorous	7723-14-0	Lead Frame	0.124	0.020	1,242		Copper	7440-50-8	97.30	
Zinc (Metal)	7440-44-0	Lead Frame	0.074	0.012	745		Iron	7439-89-6	2.30	
Aluminum oxide	1344-28-1	Die Attach	0.143	0.024	1,435		Phosphorous	7723-14-0	0.25	
Epoxy resin	Trade Secret	Die Attach	0.261	0.043	2,609		Zinc (Metal)	7440-44-0	0.15	
Amine (Trade Secret - 10039)	(Trade Secret - 1	Die Attach	0.016	0.003	157		•	Total	100.00	
Silicon	7440-21-3	Chip (Die)	1.090	0.179	10,900	0.07	(mg) Total	Die Attach	% of Total Weight	0.42
Gold	7440-57-5	Wire Bond	0.120	0.020	1,200		Aluminum oxide	1344-28-1	34	
Nickel	7440-02-0	Plating on external leads (pins)	0.431	0.071	4,308		Epoxy resin	Trade Secret	62	
Palladium	7440-05-03	Plating on external leads (pins)	0.015	0.002	145	An	nine (Trade Secret - 10039)	mine (Trade Secret - 1003	4	
Gold	7440-57-5	Plating on external leads (pins)	0.005	0.001	47			Total	100.00	•
		TOTA	S: 100.000	16.450	1,000,000	0.18	Total (mg)	Chip (Die)	% of Total Weight	1.09
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive)		otal Mass			, ,	0.18	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	100	1.09
is semiconductor device and its homogenous materials	comply with EU Directive 2002/9	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E			, ,	0.18		7440-21-3	100	0.12
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive)	comply with EU Directive 2002/9 via internal design controls, su hemical substance is NOT an in locument, there is no credible re	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor devi ason to believe that the unavoidable impurity	(RoHS Recast Dire	ective) and wit	h EU		Doped Silicon	7440-21-3 Total	100	
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive) mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this design of the second content of	comply with EU Directive 2002/9 via internal design controls, su hemical substance is NOT an in locument, there is no credible re ny regulatory scheme world-wide lammability standard for plastic	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor deviason to believe that the unavoidable impurity a.	(RoHS Recast Direction of the local part of the	ective) and wit f Microchip Te chemical sub	h EU		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive) mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this dy, is not below the threshold of regulatory concern for a lding compounds used by Microchip meet the UL94 Vo	omply with EU Directive 2002/9 via internal design controls, su hemical substance is NOT an in locument, there is no credible re ny regulatory scheme world-wide lammability standard for plastic- als/plastics/	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor deviason to believe that the unavoidable impurity s. s. You can access the UL iQTM family of datal	e and, to the best oncentration of the	ective) and wit f Microchip Te chemical sub	h EU echnology stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive) impliance with the above EU Directives has been verified chemical substance is absent from the list above, the orporated's knowledge and belief as of the date of this of, is not below the threshold of regulatory concern for a liding compounds used by Microchip meet the UL94 V0 ip.//ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shi	via internal design controls, su hemical substance is NOT an in locument, there is no credible re ny regulatory scheme world-wid- lammability standard for plastic- als/plastics/ oped are made from polyvinyl ch on in this form concerning subst- est of its knowledge and belief, a has been compiled based on th- rets and some information may e parts and the average weight	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor deviason to believe that the unavoidable impurity b. s. You can access the UL iQTM family of datal aloride (PVC) plastic. "Window envelopes" use ances restricted by RoHS in Microchip Techne is of the date listed in this form. Microchip Techne is of the date listed in Material Safety Data She not have been provided by subcontract assen of anticipated significant toxic metals compon	e and, to the best of concentration of the asses to obtain a test to hold the packin to hold the packin logy incorporated's inclogy incorporated is provided by raw olers and raw mate	f Microchip Te chemical sub t report at g slip on the o semiconducto d cannot gual material suppl ial suppliers.	h EU cchnology stance, if uter box and or devices in rantee the iers. Supplier Information	0.02	(mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total	100 100.00 % of Total Weight 100	0.12
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive) impliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this of the corporated's knowledge and belief as of the date of this of the corporated's knowledge and belief as of the date of this of the corporated's knowledge and belief as of the date of this of the corporated belief as of the date of this or publication. It is a solid to the corporate of the corporated believes the information of the corporated product is shipper the corporated believes the information of the corporated product to the boundaries and accuracy of data in this form because second only as estimates of the average weight of these corporation is often protected from disclosure as trade provided only as estimates of the average weight of these corporations.	via internal design controls, su hemical substance is NOT an in locument, there is no credible re ny regulatory scheme world-wid- lammability standard for plastic- als/plastics/ oped are made from polyvinyl ch- on in this form concerning subst- est of its knowledge and belief, a has been compiled based on th- rets and some information may the parts and the average weight and within silicon devices (silicon warranty, express or implied, wit	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor devi tason to believe that the unavoidable impurity a. s. You can access the UL iQTM family of datal alloride (PVC) plastic. "Window envelopes" use tances restricted by RoHS in Microchip Techne tas of the date listed in this form. Microchip Techne tas of the date listed in Material Safety Data She not have been provided by subcontract assen of anticipated significant toxic metals compon IC) in the finished parts. The respect to the information provided in this desired.	e and, to the best of concentration of the asses to obtain a test to hold the packin body incorporated's provided by raw part and raw mate and raw mate and raw mate and raw mate and raw maters. These estimate claration. The excli	ective) and with the chemical substantial suppliers. It is done to the chemical suppliers and the chemical suppliers and the chemical suppliers. It is do not inclusive, limited pusive, limit	h EU echnology stance, if uter box and or devices in rantee the iers. Supplier information de trace	0.02	(mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.12
is semiconductor device and its homogenous materials ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive) impliance with the above EU Directives has been verified to chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ey, is not below the threshold of regulatory concern for a liding compounds used by Microchip meet the UL94 V0 ip://ul.com/global/eng/pages/offerings/industries/chemic is protective "tubes" in which the specific product is shi tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informatic ir original packing materials is true and correct to the bimpleteness and accuracy of data in this form because it orrovided only as estimates of the average weight of thesels of dopants, metals, and non-metal materials contain crochip Technology Incorporated does not provide any trranties provided by Microchip Technology Incorporated in the corporated only a provide only Microchip Technology Incorporated in the corporated only a provide any trranties provided by Microchip Technology Incorporated in the corporated in the corporated only as provided by Microchip Technology Incorporated in the corporated in the corporated in the corporated by Microchip Technology Incorporated in the corporated	via internal design controls, such memical substance is NOT an indocument, there is no credible reyregulatory scheme world-widdlammability standard for plasticals/plastics/oped are made from polyvinyl changes to fits knowledge and belief, a has been compiled based on thrests and some information may be parts and the average weight and within silicon devices (silicon varranty, express or implied, with and its subsidiaries are contain changes to Material Content Deethe users' reliance on the inform	otal Mass 5/EC (RoHS Directive), EU Directive 2011/65/E pplier declarations, and /or analytical test data tentional ingredient in the semiconductor deviason to believe that the unavoidable impurity a. s. You can access the UL iQTM family of datal cloride (PVC) plastic. "Window envelopes" use ances restricted by RoHS in Microchip Techno is of the date listed in this form. Microchip Te er anges provided in Material Safety Data She not have been provided by subcontract assen of anticipated significant toxic metals compon IC) in the finished parts. h respect to the information provided in this of and in Microchip's standard terms and conditi- clarations and shall not be liable for any dama	e and, to the best of concentration of the asses to obtain a test to hold the packin to hold the packin pogy Incorporated's provided by raw plers and raw materits. These estimates of sale. These areas, direct or indirect estimates, direct or indirect estimates.	f Microchip Te chemical sub treport at g slip on the o semiconducted cannot guar material supplial suppliers. es do not inclusive, limited pe provided in tt, consequent	h EU chnology stance, if uter box and or devices in rantee the iers. Supplier information de trace product Microchip's	0.02	(mg) Total Doped Gold (mg) Total Nickel	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100 100.00 % of Total Weight 100 100.00 % of Total Weight 95.73	0.12

OT 06 SOT-23 11:11 AM : 8/29/2013

AICROCHIP	oo Turou Cil OT . (200 a la COT 22 and		nation Base opper Alloy (0	-		•	ogeneous Materials: .g. pc boards, display	s)	JEDEC 97 Product Markin and/or Pkg. Labeling e3
Basic Substance	ce Type: CH and OT ("Contained In" Sub-Component	% Total Weight	mg/part	ppm	13.57	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	67.830	11.531	678,300		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.888	0.831	48,878		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin	Trade Secret	Mold Compound	4.888	0.831	48,878		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.955	0.332	19,551		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.239	0.041	2,394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.031	1.705	100.314		Calboli black	Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.042	2,468	1.79	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.034	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.002	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.001	87		Silver	7440-22-4	1.91	
Epoxy resin	Trade Secret	Die Attach	0.563	0.096	5,625		Zinc	7440-66-6	0.13	
Silicon dioxide	7631-86-9	Die Attach	0.169	0.029	1,688		Phosphorous	7723-14-0	0.08	
Curing / Hardener	Trade Secret	Die Attach	0.019	0.003	188			Total	100.00	
Silicon	7440-21-3	Chip (Die)	7.500	1.275	75,000	0.13	(mg) Total	Die Attach	% of Total Weight	0.75
Doped Gold	7440-57-5	Wire Bond	0.200	0.034	2,000		Epoxy resin	Trade Secret	75	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.213	12,500		Silicon dioxide	7631-86-9	23	
							Omoon dioxido			
		TOTAL S.		17 000	1 000 000		Curing / Hardener	Trade Secret	3	
	comply with EU Directive 20	TOTALS: g Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	100.000	17.000 ective) and wit	1,000,000 th EU	1.28	Curing / Hardener (mg) Total	Trade Secret Total Chip (Die)	3 100.00 % of Total Weight	7.5
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verified themical substance is absent from the list above, the definition of the control of the con	comply with EU Directive 20 b. d via internal design controls chemical substance is NOT a	g Total Mass 02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and,	100.000 S Recast Dire	ective) and wit	th EU echnology	1.28		Total	100.00	7.5
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ipliance with the above EU Directives has been verified chemical substance is absent from the list above, the proprated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 ://ul.com/global/eng/pages/offerings/industries/chemic	comply with EU Directive 20 d via internal design controls themical substance is NOT a document, there is no credib ny regulatory scheme world- flammability standard for pla als/plastics/	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concentivide. Stics. You can access the UL iQTM family of databases to	100.000 S Recast Dire to the best contration of the	ective) and wit of Microchip To chemical sub t report at	th EU echnology ostance, if	0.03	(mg) Total	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	7.5
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ipliance with the above EU Directives has been verified chemical substance is absent from the list above, the proprated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 ://ul.com/global/eng/pages/offerings/industries/chemic	comply with EU Directive 20 d via internal design controls themical substance is NOT a document, there is no credib ny regulatory scheme world- flammability standard for pla als/plastics/	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concendide.	100.000 S Recast Dire to the best contration of the	ective) and wit of Microchip To chemical sub t report at	th EU echnology ostance, if		(mg) Total Doped Silicon	Total Chip (Die) 7440-21-3 Total	100.00 % of Total Weight 100 100.00	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) ppliance with the above EU Directives has been verified themical substance is absent from the list above, the cryporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shi certain "reels" may be made from PVC plastic.	comply with EU Directive 20 i. dvia internal design controls chemical substance is NOT a document, there is no credib ny regulatory scheme world-flammability standard for pla als/plastics/ pped are made from polyving	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concentivide. Stics. You can access the UL iQTM family of databases to the Identity of Identity	100.000 S Recast Directors, to the best on the test of the best of	of Microchip To chemical sub treport at g slip on the c	echnology sostance, if		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verified inchemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 ://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shid certain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the informativelir original packing materials is true and correct to the completeness and accuracy of data in this form becau plier information is often protected from disclosure as	comply with EU Directive 20 b. do via internal design controls chemical substance is NOT a document, there is no credib ny regulatory scheme world-flammability standard for pla als/plastics/ piped are made from polyving on in this form concerning sue best of its knowledge and bese it has been compiled base trade secrets and some info reight of these parts and the	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen- wide. Stics. You can access the UL iQTM family of databases to It chloride (PVC) plastic. "Window envelopes" used to ho abstances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technol d on the ranges provided in Material Safety Data Sheets mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	100.000 S Recast Dire to the best of tration of the o obtain a tes old the packin accorporated's logy incorpor provided by r emblers and i	of Microchip To chemical sub- t report at g slip on the c semiconduct ated cannot g aw material s aw material s	echnology ostance, if outer box or devices juarantee uppliers. uppliers.		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verifile chemical substance is absent from the list above, the cryporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 c?/ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shi certain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the informativation roginal packing materials is true and correct to the completeness and accuracy of data in this form because information is often protected from disclosure as rmation is provided only as estimates of the average wade trace levels of dopants, metals, and non-metal materiochip Technology Incorporated does not provide any	comply with EU Directive 20 b. do via internal design controls chemical substance is NOT a document, there is no credib ny regulatory scheme world-flammability standard for pla als/plastics/ pped are made from polyving on in this form concerning step to the secrets and some inforceight of these parts and the terials contained within silicowarranty, express or implied base	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH , supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, le reason to believe that the unavoidable impurity concen- wide. Stics. You can access the UL iQTM family of databases to It chloride (PVC) plastic. "Window envelopes" used to ho abstances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technol d on the ranges provided in Material Safety Data Sheets mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con	100.000 S Recast Dire to the best of tration of the o obtain a tes old the packin accrporated's logy incorpor provided by remblers and in mponents. Th	of Microchip To chemical sub- t report at g slip on the co- semiconducta ated cannot g aw material s ese estimates	echnology ostance, if outer box or devices uarantee uppliers. s do not product		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) pliance with the above EU Directives has been verifile chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 V0 ://ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic. rochip Technology Incorporated believes the informative information is often protected from disclosure as mation is provided only as estimates of the average we used trace levels of dopants, metals, and non-metal materiors and accuracy of data in this form because the provided only as estimates of the average we used trace levels of dopants, metals, and non-metal materiors and accuracy of data in this form because the provided by Microchip Technology Incorporated does not provide any vanities provided by Microchip Technology Incorporate tations, sales order acknowledgement, and invoices.	comply with EU Directive 20 b. do tia internal design controls chemical substance is NOT a document, there is no credib ny regulatory scheme world-flammability standard for pla als/plastics/ pped are made from polyviny pped are made from polyviny on in this form concerning state best of its knowledge and bese it has been compiled base trade secrets and some inforcight of these parts and the terials contained within silico warranty, express or implied and its subsidiaries are concerning states.	g Total Mass D2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, te reason to believe that the unavoidable impurity concen- wide. Stics. You can access the UL iQTM family of databases to It chloride (PVC) plastic. "Window envelopes" used to ho abstances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technol d on the ranges provided in Material Safety Data Sheets is mation may not have been provided by subcontract asses average weight of anticipated significant toxic metals con n devices (silicon IC) in the finished parts. with respect to the information provided in this declaration.	s Recast Directory to the best of the test of the test of the packing a test of the packing and the packing provided by remblers and imponents. The test of the t	octive) and with a sective of Microchip To chemical subtraction of the chemical subtra	echnology potance, if outer box or devices purantee puppliers. uppliers. s do not product Microchip's tial or	0.03	(mg) Total Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2

CH OT 06-SOT-23 NC 11:11 AM: 8/29/2013

Total 100.00 To	MICROCHIP Semiconductor Device Type	e: MB 03 (Lead	SOT-89 (A5/AT)		nation Base A	•		•	ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Silco, villoos			"Contained In"	,	malnart	nnm	28.26	(mg) Total	Mold Compound	% ot Total Weight	54.56
From Sear No. Accordance Trade Secret Mode Compound 3.342 1731 3.448 Process Process Mode Compound 3.342 1731 3.448 Process Mode Compound Mode Compound 3.342 1731 3.448 Process Mode Compound Mode Compou			•					Cilion vitronuo	60676 96 0	9E 00	l
Phenotic Ream No. Br. Cit., SSOS). No. destrotrony toxicols Trade Secret Mod. Compound 1,3342 1,731 33,418											
Epoty Create Nervices 7800-09-22 Mold Compround 0.192 0.082 13.097 0.092 13.097 0.092 13.097 0.093 13.097 0.093 0.											
Copper											
Copper											
100	Copper	7440-50-8		42.275	21.899	422.753			Total	100.00	1
Silver 1744-0-22-4 Leas Frame 0.08-43 0.437 6.540 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.			Lead Frame	1.040			22 92	(mg) Total	Lead Frame		44 25
Zinc 1446-66-6 Lead Frame 0.055 0.020 0.051 1.024 1.02							22.02				12
Phosphorous Process Proc											
Metal codes Trade Secret Din Atlach 0.102 0.053 1.023 Epocy resins Trade Secret Din Atlach 0.102 0.053 1.023 Epocy resins Trade Secret Din Atlach 0.073 0.040 775 0.040 0.053 0.052											
Epony resins Trade Secret Die Attach 0.020 0.083 1.023 Glycol ethers Trade Secret Die Attach 0.076 0.077 5 Total 10.00 75 Tota											
Glycol atheres Trade Secret Die Attach 0.078 0.040 775 G. Curring/Harderer Trade Secret Die Attach 0.028 0.014 279 0.16 (mg) Tatal Die Attach 5,916 (Tatal Weight 0.31 0.000 7140-21-3 0.000			Die Attach	0.102							
Curing / Hardener Trade Secret Die Attach 0.028 0.014 279 0.16 (mg) Total Die Atlach 0.012 0.014 0.212 4.100 0.212										100.00	1
Silicon 7440-21-3 Chip (Die) 0.410 0.212 4,100 Gold 7440-57-5 Wire Bord 0.350 0.181 3.350 Tin 7440-31-5 Percy on external basis (perc). Market Tin / ramphal strictly C but 1 ton 2. 1.20 0.050 1.180 3.350 Tin 7440-31-5 Percy on external basis (perc). Market Tin / ramphal strictly C but 1 ton 2. 1.20 0.050 1.800 1.000							0.16	(mg) Total			0.21
Figure 1							0.10				0.51
Uniform the protection of the specific product is shipped are made from polyvingl challenge in the specifical polycoid and in this form concerning substances restricted by ROHS in Microchip Technology Incorporated does not provided only as estimates of the average weight of these parts and the ave											
O.0518 g Total Mass O.052 g Total Mass O.053 g Total Mass O.052											
O.518 g Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Chemical substance is absent from the list above, the chemical substance is NOT an internitional ingredient in the semiconductor device and, to the best of Microchip Technology proprated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is NOT an internitional ingredient in the semiconductor device and, to the best of Microchip Technology proprated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, is not below the threshold of regulatory concent for any regulatory scheme world-wide. 10.18 (mg) Total Wire Bond % of Total Weight 0.35 (mg) Total Wire Bond % of Total Weight 0.35 (mg) Total wire Bond % of Total Weight 0.35 (mg) Total microchip Technology (noorporated believes the information in this form concerning substances restricted by ROHS in Microchip Technology (noorporated semiconductor devices in reginal pasking materials is true and correct to the base of its knowledge and believe the information in the base of its knowledge and believe the base of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace sort downward and the average weight of these parts and the average wei	1111	7440-51-5									
Is semiconductor device and its homogenous materials comply with EU Directive 2002/98/EC (RoHs Directive), EU Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2002/98/EC (RoHs Directive). EU Directive 2011/68/EU (RoHS Recast Directive) and with EU Directive 2011/69/EU (Poles)		0.0540		100.000	01.000	1,000,000		Outling / Harderici		Ū	1
pillance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. Doped Silicon 7440-21-3 100									70141	.00.00	
themical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology proprated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern or any regulatory scheme world-wide. In some blow the threshold of regulatory concern or any regulatory scheme world-wide. In some blow threshold of regulatory concern for any regulatory scheme world-wide. In which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" may be made from PVC plastic. In the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" may be made from PVC plastic. In the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" may be made from PVC plastic. In the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" and polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and an "reels" and polyvinyl chloride (PVC) plastic. In the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and accuracy of data in this form because it has been complied based on th		with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	dS Recast Direct	tive) and with	FII					
chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology prorated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ding compounds and the service of the plastic of the pl	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).				,o, u	. 20	0.21	Total (mg)	Chip (Die)	% of Total Weight	0.41
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and ain "reels" may be made from PVC plastic. Total 100.00 Total	ompliance with the above EU Directives has been verified via interest.	_			,		0.21	,	7440-21-3	100	0.41
rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in roriginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace its of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. **Torchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's an	ompliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemica corporated's knowledge and belief as of the date of this docume by, is not below the threshold of regulatory concern for any regu colding compounds used by Microchip meet the UL94 VO flammal	al substance is NOT ent, there is no credi alatory scheme work bility standard for pl	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce i-wide.	ntration of the	Microchip Te	chnology		Doped Silicon	7440-21-3 Total	100	
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's one of the contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's one of the contained in Microchip's one of the contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's one of the contained in Micro	ompliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal tp://ul.com/global/eng/pages/offerings/industries/chemicals/plas	al substance is NOT ent, there is no credi alatory scheme work bility standard for pl stics/	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce -wide. astics. You can access the UL iQTM family of databases to	ntration of the	Microchip Techemical subs	chnology stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
erwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or a line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or a line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or line of the users' reliance or line of the users' rel	ompliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flammal tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastered protective "tubes" in which the specific product is shipped are retain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in this eir original packing materials is true and correct to the best of it ompleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts	al substance is NOT ent, there is no credi illatory scheme world bility standard for pl stics/ re made from polyvir is form concerning s is knowledge and be ene compiled based of d some information is and the average we	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to the control of the	ntration of the obtain a test old the packing ncorporated's seguincorporated vided by raw mand raw materi	Microchip Techemical substreport at slip on the outer demiconducto d cannot guaraterial suppliers. I	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
Total 100 00	ompliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemica corporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flammal tp://ul.com/global/eng/pages/offerings/industries/chemicals/plastine protective "tubes" in which the specific product is shipped are retain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of its impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts vels of dopants, metals, and non-metal materials contained with icrochip Technology Incorporated does not provide any warrants in the secret in the provide of the provide any warrants in the provide of the provide any warrants in the provide and the provide any warrants in the provide and the provide any warrants in the provide and the pro	al substance is NOT ent, there is no credi illatory scheme world bility standard for pl stics/ re made from polyvir is form concerning s is knowledge and be ene compiled based d some information is and the average we in silicon devices (s y, express or implie	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in the control of the	ntration of the coordinates of the packing of the p	Microchip Techemical substreport at slip on the outerionducto d cannot guaraterial supplied al suppliers. It is do not inclusive, limited p	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace	0.18	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.35
	empliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 flammal pp://ul.com/global/eng/pages/offerings/industries/chemicals/plass are protective "tubes" in which the specific product is shipped arritain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this irroriginal packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts rels of dopants, metals, and non-metal materials contained with crochip Technology Incorporated does not provide any warrant tranties provided by Microchip Technology Incorporated and its otations, sales order acknowledgement, and invoices.	al substance is NOT ent, there is no credi illatory scheme work bility standard for pl stics/ re made from polyvir is form concerning s is knowledge and be even compiled based of ald some information is and the average we in silicon devices (s y, express or implies s subsidiaries are conserved.	an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to a concentration of the concentration	ntration of the coordinates of the packing of the p	Microchip Techemical substreport at slip on the outerion ducto discannot guaraterial suppliers. It is do not includisive, limited provided in Microchemical suppliers, a consequenti	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace roduct Microchip's	0.18	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.35

MB 3 SOT-89 11:11 AM : 8/29/2013

Basic Substance CAS Number SUb-Component Weight mg/gart ppm Sites witness Exercised Exercised	Sale Substance	MICROCHIP Semiconductor Device Type	 e: RC 04 (Lea	a) SOT-143 (F7/AB)		nation Base A pper Alloy (C	•		•	ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Seale Substance	Basic Substance	Connecticutor Device Type	. 110 04 (Lead		% Total							
Siles Nicros 5007-6-0 Mod Compound 3-850 3-850 3-850 5-8	Silvay 1909 5071-56-01 1000	Basic Substance	CAS Number		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mg/nart	nnm	5.69	(mg) Total	Mold Compound	% ot Total Weight	62.57
Excess Record Not Discretic Not described by Table Spotest Mode Compound 3.582 3.584 5.584	Score February F			•		<u> </u>			Silica vitreous	60676-86-0	85.00	
Preside Research Plant (Page 176, 1850), No dereference (page 186, 186, 186, 186, 186, 186, 186, 186,	Phone Report Page											
Egroy Create Necessary 29660-02-2 Noted Compound 1,033 0,139 15,300 1,00	Property											
No. 1743-93-9-0	No.			Mold Compound	1.533	0.139	15,330		Epoxy, Cresol Novolac	29690-82-2	2.45	
Noted Prate	Nicke 7440-02-0 Lead Frame 0.502 0.204 5.502 20 20 20 20 20 20 20	Carbon Black	1333-86-4	Mold Compound	0.188	0.017	1,877		Carbon Black	1333-86-4	0.30	
Silver	Short	Iron	7439-89-6	Lead Frame	14.095	1.283	140,947			Total	100.00	
Silver	Silver	Nickel	7440-02-0	Lead Frame	11.071	1.007	110,712	2.40	(mg) Total	Lead Frame	% of Total Weight	26.36
Cobat	Cobat 7440-48-4 Lead Frame 0.254 0.023 2.505 See Management 7420-48-5 Lead Frame 0.711 0.010 2.100 See 7440-71-3 Lead Frame 0.079 0.007 751 See 7440-71-3 See 7440-71-3 Lead Frame 0.079 0.007 751 See 7440-71-3 See See 7440-71-3 See See 7440-71-3 See See 7440-71-3 See S	Silver	7440-22-4	Lead Frame	0.502	0.046	5.022			7439-89-6		
Silicon 7440-40 Load Frime 0.132 0.012 1.318 Silicon 7440-42 Load Frime 0.079 0.079 0.079 1.007 Managemen 7450-84-5 0.80	Track Trac											
Silicon 7440-44 Lead Frame 0.132 0.112 1,318 Million 7440-21-3 Lead Frame 0.079 0.007 791 Million 7440-21-3 Lead Frame 0.079 0.007 791 Million 7440-21-3 De Attach 0.259 0.004 2,591 Million 7440-22-4 De Attach 0.025 0.005 Million 7440-21-3 De Attach 0.005 0.005 Million 7440-21-3 De Attach 0.005 Million 7440-21-3 Million Million 7440-21-3 Million Mil	Activate	Manganese	7439-96-5	Lead Frame	0.211	0.019	2,109		Silver	7440-22-4	1.91	
Proposition (Ag) 7430-22-4 Dia Attach 0.029 0.001 68 Store (Ag) 740-21-3 0.00 Minus (Ag) 740-21-	Phosphorous P722-H4-0 Least Frame 0.007 0.001 68 Silver (Ap) 7440-22-4 Da Attach 0.001 0.000 1.000 279 0.001 270 279 1.000 270	Zinc (Metal)	7440-44-0	Lead Frame	0.132	0.012			Cobalt	7440-48-4		
Silver (Ag) 7440-224 Die Attach 0.081 0.086 Altach 1.096 1.096 Altach 1.096 Altach 1.096 1.096 Altach 1.096 Alta	Sign (Ag) 1744-022-4 Dis Attach 0.289 0.024 2.291 Proprietary Nean 1766-Secret Dis Attach 0.081 0.006 61 Proprietary Nean 1766-Secret Dis Attach 0.081 0.007 0.000 61 Proprietary Nean 1766-Secret Dis Attach 0.000 61 Proprietary Nean 17	Silicon	7440-21-3	Lead Frame	0.079	0.007	791		Manganese	7439-96-5	0.80	
Silver (Ag) 7440-224 Die Attach 0.081 0.086 Altach 1.096 1.096 Altach 1.096 Altach 1.096 1.096 Altach 1.096 Alta	Silver (Ag) 1744-022-4 Die Attach 0.289 0.024 2.291 Proprietary Resin 1746-56-5crt Die Attach 0.061 0.056 617 Proprietary Curry agent & Fastrelener 1746-55-brott Die Attach 0.061 0.056 617 Proprietary Curry agent & Fastrelener 1746-55-brott Die Attach 0.061 0.056 617 Proprietary Curry agent & Fastrelener 1746-55-brott Die Attach 0.061 0.056 617 Proprietary Curry agent & Fastrelener 1746-55-brott Die Attach 0.061 0.056 617 Proprietary Curry agent & Fastrelener 1746-55-brott Die Attach 0.061 0.0	Phosphorous	7723-14-0	Lead Frame	0.007	0.001	66		Zinc (Metal)	7440-66-6	0.50	
Proprietary Curing agent & Hardener Trade Secret Die Attach 0.010 0.001 42,000 0.30 (mp.) Total 100.00 0.30 (mp.) Total 100.00 0.30 (mp.) Total 2,000 0.30 (mp.) Total 3,000 0.30 (mp.) Total 4,000 0.30 (mp.)	Proprietary Curing agent & Hardener Siston 7440-21-3 Chip (Del) 4.200 0.309 0.42,000 0.309 0.42,	Silver (Ag)		Die Attach	0.259	0.024	2,591		Silicon	7440-21-3	0.30	
Silicon 7440-21-3 Chip (Die) 4.290 0.390 42-900 0.93 (ma) Total — Die Attach — 3x6 Total Weight 0.31 (Miles Die Attach — 3x6 Total Weight 0.32 (Miles Die Attach — 3x6 Total Weight 0.34 (Miles Die Attach — 3x6 Total — 3x6 T	Silcon 7440213 Che (De) 4.290 0.399 42,900 0.00 0.00 1.000 Ster (Ag) 7440224 79 10 10 10 10 10 10 10 10 10 10 10 10 10	Proprietary Resin	Trade Secret	Die Attach	0.061	0.006	611		Phosphorous	7723-14-0	0.03	
Gold 7440-57-5 Wire Bond 1	Gold 7440-57-5 Wre Bond 10-000 9.100 0.010 0.010 1.000 9.100 1.000 9.100 1.000 9.100 1.000 9.100 1.000 9.100 1.000 9.100 1.000	Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.010	0.001	99			Total	100.00	
Gold 744057-5 Wire Bond To 10-10 0.10	Gold 7440-57-5 Wire Bond 0.10 0.10 0.10 0.10 0.10 0.10 0.00 Properties (1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0		7440-21-3	Chip (Die)	4.290	0.390	42.900	0.03	(mg) Total	Die Attach	% of Total Weight	0.33
Tin 7440-31-5 Puting on external leads (pen) - Meter Tn1 annexed at 1507C for 1 to 7 (10, 340) 0.009 1, 0000 1, 000, 0000 1 0, 000, 0000 1 0, 0000 0.000 0.000	Tim P440315 Plant go neternal basis (gava) - Mate Tn / arrealed at 150°C for 1 hood 0 9,100 1,000,000 9,100 1,000,000 1,000,000 1,000,000 1,000,000				0.110							
Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU circle (RoHG Cleft-of-Life Vehicles (ELV) Directive). In planace with the above EU Directive has been everified via internal design controls, supplier declarations, and /or analytical test data. In chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern from any regulatory concern from the U.S.4 V0 flammability standard for plastics. You can access the U. IQTM family of databases to obtain a test report at the templet of the packing slip on the outer box and tain "reset" may be made from PCV plastic. In concern from the list above, the chemical substance is a stream of the second provided only	Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU circle (RoHS Recast Directive)		7440-31-5		6.340	0.577						
Semiconductor device and its homogenous materials comply with EU Directive 2002/53/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU control of the control	Semiconductor device and its homogenous materials comply with EU Directive 2002/55/EC (End-of-Life Vehicles (ELV) Directive). Mipliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Total 100.00 Total (mg) Chip (Die) % of Total Weight 4.2 Dioped Silcon 7440-21-3 100.00 Total (mg) Total 100.00 Wire Bond % of Total Weight 0.1 Mire Bond % of Total Weight 0.1 Total 100.00 Total (mg) Total 100.00 Total 100.0				100.000	9.100	1.000.000	Proprietar	v Curing agent & Hardener	Trade Secret	3	
s semiconductor device and its homogenous materials comply with EU Directive 2002/85/EC (Roh5 Directive), EU Directive 2011/65/EU (Roh5 Recast Directive) and with EU 10.39 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Die) % of Total Weight 4.29 Total (mg) Total (mg) Chip (Total (mg) Chip (mg)	s semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Decitive 2002/95/EC (RoHS Directive)) and with EU Directive 2002/95/EC (RoHS Directive). But Directive 2011/65/EU (RoHS Directive) and with EU Directive 2002/95/EC (RoHS Directive). But Directive 2011/65/EU (RoHS Directive) and with EU Directive 2002/95/EC (RoHS Directive). But Directive 2012/95/EC (RoHS Directive). But Directive 2012/95/EC (RoHS Directive) and with EU Directive 2002/95/EC (RoHS Directive). But Directive 2012/95/EC (RoHS Directive). But Directive 2014/95/EC (RoHS Direct		0.0001	a Total Mass			,,			Total	100.00	
chemical substance is absent from the list above, the chemical substance is NOT in intentional ingredient in the semiconductor device and, to the best of Microchip Technology proprated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if it is not below the threshold of regulatory concern for any regulatory scheme world-wide. Iding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at concerning substance is NOT and the unavoidable impurity concentration of the chemical substance, if it is not below the threshold of regulatory concern for any regulatory scheme world-wide. Iding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at concerning substance is NOT and the unavoidable impurity concentration of the chemical substance, if it is not below the threshold of regulatory concern for any regulatory scheme world-wide. Iding compounds used by Microchip Technology Incorporated concerning substance is not protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "real" in regulatory by the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "real" in regulatory by the packing slip on the outer box and tain "real" in regulatory by the packing slip on the outer box and tain "real" in regulatory by a set of the set of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarate the uppleteness and accuracy of data in this form because it has been complied by substances and accuracy of data in this form	chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology proprised's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. ding compounds used by Microchip meet the UL34 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at incomplete the properties of the concentration of the chemical splastics. protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "reels" may be made from PVC plastic. Total 100.00 Total Wire Bond % of Total Weight 0.1 (mg) Total Wire Bond % of Total Weight 0.1 (mg) Total Umra Doped Gold 7.440-57-5 100 Doped Gold 7.440-57-5 100 Doped Gold 7.440-57-5 100 Total 100.00 T	•	ū						Doped Silicon			
p://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ e protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and train "reels" may be made from PVC plastic. Doped Gold T440-57-5 100	p://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "reels" may be made from PVC plastic. Total 100.00 Total	orporated's knowledge and belief as of the date of this documents, is not below the threshold of regulatory concern for any regul	nt, there is no credi latory scheme work	ible reason to believe that the unavoidable impurity conce d-wide.	entration of the	chemical subs						
Total 100.00	Total 100.00 To	o://ul.com/global/eng/pages/offerings/industries/chemicals/plast	tics/	•		•		0.01	(mg) Total	Wire Bond	% of Total Weight	0.11
rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in rodiginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier rmation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace else of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. **Tochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's anealed at 150°C for annealed at	rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in roriginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier romation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace estimates do not include trace of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Trochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's according to the second and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's according to the second and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's according to the second and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's according to the second and its subsidiaries are contained in Microchip's according to the second and its subsidiaries are contained in Microchip's according to the second and its subsidiaries are contained in Microchip's acc		made from polyvi	nyl chloride (PVC) plastic. "Window envelopes" used to h	old the packing	slip on the ou	iter box and		Doped Gold			
trranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's otations, sales order acknowledgement, and invoices. crochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products. Matter Tin	trranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtained and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's obtained and invoices. Crochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products. Total 100.00	eir original packing materials is true and correct to the best of its mpleteness and accuracy of data in this form because it has bet ormation is often protected from disclosure as trade secrets and provided only as estimates of the average weight of these parts	s knowledge and be en compiled based d some information and the average we	elief, as of the date listed in this form. Microchip Technolo on the ranges provided in Material Safety Data Sheets pro n may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I	gy Incorporate ovided by raw n and raw mater	d cannot guara naterial supplici ial suppliers. Ir	antee the ers. Supplier nformation			Total	100.00	
nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or Tin 7440-31-5 100.00 this Certificate of Compliance for semiconductor products.	therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	veis of dopants, metals, and non-metal materials contained within			tion. The exclu			0.58	(mg) Total			
Total 100.00		icrochip Technology Incorporated does not provide any warranty arranties provided by Microchip Technology Incorporated and its			sale. These are	e provided in N	/licrocnip's	0.30	(9) . 0 (0.1		% of Total Weight	6.34
		crochip Technology Incorporated does not provide any warranty rranties provided by Microchip Technology Incorporated and its otations, sales order acknowledgement, and invoices. crochip disclaims any duty to notify users of updates or change lerwise, suffered by users or third parties as a result of the user	s subsidiaries are c s to Material Conte	ontained in Microchip's standard terms and conditions of nt Declarations and shall not be liable for any damages, di	irect or indirect	t, consequentia	al or	0.30		/ annealed at 150°C for		6.34

RC 4 SOT-143 11:11 AM : 8/29/2013

MICROCHIP Semiconductor Device Typ	e· DR 03 (Local) SOT-2			nation Base A pper Alloy (C	-			nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
- Connection Device Typ	C: DB 03 (Lead) 301-2		0/ T -4-1	1						
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	56.72	(mg) Total	Mold Compound	% ot Total Weight	49.02
Silica, vitreous	60676-86-0	Mold Compound	41.667	48.209	416,670		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.002	3.474	30,025		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.002	3.474	30,025		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.201	1.390	12,010		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.147	0.170	1,471		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	44.941	51.997	449,408			Total	100.00	
Iron	7439-89-6	Lead Frame	1.105	1.279	11,054	54.43	(mg) Total	Lead Frame	% of Total Weight	47.04
Silver	7440-22-4	Lead Frame	0.896	1.037	8,961		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.059	0.068	588		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.039	0.045	388		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.502	0.581	5,024		Zinc	7440-66-6	0.13	
Proprietary Resin	Trade Secret	Die Attach	0.118	0.137	1.184		Phosphorous	7723-14-0	0.08	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.019	0.022	192			Total	100.00	1
Silicon	7440-21-3	Chip (Die)	1.580	1.828	15,800	0.74	(mg) Total	Die Attach	% of Total Weight	0.64
Gold	7440-57-5	Wire Bond	0.150	0.174	1.500	0.74	Silver (Ag)	7440-22-4	79	0.04
Tin		n external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.570	1.816	15,700		Proprietary Resin	Trade Secret	19	
	7440-31-5 Plating 6	TOTALS:		115.700	1.000.000	Di-t	Curing agent & Hardener	Trade Secret	3	
	- · · · - ·		100.000	113.700	1,000,000	Fioprietar	Curing agent & Hardener	Total	100.00	1
	0.1157 g Tota	al Mass						i otai	100.00	
	y with 20 Directive 2002/30/2	to (None Directive), Lo Directive 201 //03/LO (Non	HS Recast Dire	ctive) and with	EU	1.83	Total (mg)	Chip (Die)	% of Total Weight	1.58
his semiconductor device and its homogenous materials compl irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in		, , ,	HS Recast Dire	ctive) and with	EU	1.83	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	1.58
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in	ternal design controls, suppl	ier declarations, and /or analytical test data.		·		1.83		,		
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and	d, to the best of	Microchip Ted	chnology	1.83		7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docume	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. \	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce	d, to the best of entration of the	Microchip Tec chemical subs	chnology	0.17		7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documiny, is not below the threshold of regulatory concern for any regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. \	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce You can access the UL iQTM family of databases	d, to the best of entration of the to obtain a test	Microchip Tec chemical subs report at	chnology tance, if		Doped Silicon	7440-21-3 Total	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regu	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. \ stics/ re made from polyvinyl chlor	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce You can access the UL iQTM family of databases of the impurity conce in the impurity concerns the impurity concern	d, to the best of intration of the to obtain a test	Microchip Tec chemical subs report at slip on the ou	chnology tance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.15
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documiny, is not below the threshold of regulatory concern for any regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammattp://ul.com/global/eng/pages/offerings/industries/chemicals/plainhe protective "tubes" in which the specific product is shipped a	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. Y stics/ re made from polyvinyl chlor his form concerning substance ts knowledge and belief, as a seen compiled based on the re and some information may no s and the average weight of a	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce of the control of the	d, to the best of intration of the to obtain a test old the packing incorporated's gy incorporate voided by raw n and raw materi	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial supplie	chnology tance, if ter box and devices in intee the ers. Supplier information		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.15
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documiny, is not below the threshold of regulatory concern for any regulatory concern for any regulatory. In the protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the interioriginal packing materials is true and correct to the best of incormation is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these particular of dopants, metals, and non-metal materials contained with licrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and in unclations, sales order acknowledgement, and invoices.	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. I stics/ re made from polyvinyl chlor his form concerning substant is knowledge and belief, as of een compiled based on the rand some information may no a and the average weight of a inis silicon devices (silicon IC ty, express or implied, with r ts subsidiaries are contained	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce on the control of the data sees of the control of the contro	d, to the best of intration of the to obtain a test old the packing incorporated size of the packing incorporated by raw in and raw mater. These estimate stion. The exclusiale. These are	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not include sive, limited pr	thnology tance, if ter box and devices in intee the ers. Supplier information le trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.15
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documiny, is not below the threshold of regulatory concern for any regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of the specific product is shipped a ertain "reels" may be made from PVC plastic. It is not below the threshold of the specific product is shipped a ertain "reels" may be made from PVC plastic. It is not product to the best of it is of the specific product is shipped and in the specific product is shipped a ertain "reels" may be made from PVC plastic. It is not provided only as estimates of the average weight of these participation is often protected from disclosure as trade secrets at a provided only as estimates of the average weight of these participations, metals, and non-metal materials contained with discrochip Technology Incorporated and it is not provide any warrant arranties provided by Microchip Technology Incorporated and it is not provide any warrant arranties provided by Microchip Technology Incorporated and it is not provide any warrant arranties provided by Microchip Technology Incorporated and it is not provide any warrant arranties provided by Microchip Technology Incorporated and it is not provide any warranties provided by Microchip Technology Incorporated and it is not provide any warranties provided by Microchip Technology Incorporated and it is not provide any warranties provide	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. Yes stics/ re made from polyvinyl chlor his form concerning substance ts knowledge and belief, as a een compiled based on the re and some information may no as and the average weight of a hin silicon devices (silicon IC ty, express or implied, with re ts subsidiaries are contained es to Material Content Declar	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce of the control of the	d, to the best of intration of the to obtain a test to obtain a test old the packing incorporated's agy incorporate by ded by raw n and raw mater' These estimate stion. The exclusion. The sale. These are irect or indirect	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial suppliers. Ir s do not include sive, limited pre provided in N	the box and devices in intendent the ers. Supplier information le trace	0.17	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 100.00 % of Total Weight 100 100.00	0.15
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this documiny, is not below the threshold of regulatory concern for any regulatory, is not below the threshold of regulatory concern for any regulatory. In the protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in the leir original packing materials is true and correct to the best of incompleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets and provided only as estimates of the average weight of these partivels of dopants, metals, and non-metal materials contained with ilicrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and it ulotations, sales order acknowledgement, and invoices. licrochip disclaims any duty to notify users of updates or chang therwise, suffered by users or third parties as a result of the use	ternal design controls, suppl al substance is NOT an inten ent, there is no credible reas ulatory scheme world-wide. ability standard for plastics. Yes stics/ re made from polyvinyl chlor his form concerning substance ts knowledge and belief, as a een compiled based on the re and some information may no as and the average weight of a hin silicon devices (silicon IC ty, express or implied, with re ts subsidiaries are contained es to Material Content Declar	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity conce of the control of the	d, to the best of intration of the to obtain a test to obtain a test old the packing incorporated's agy incorporate by ded by raw n and raw mater' These estimate stion. The exclusion. The sale. These are irect or indirect	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial suppliers. Ir s do not include sive, limited pre provided in N	the box and devices in intendent the ers. Supplier information le trace	0.17	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.15

DB 3 SOT-23 11:11 AM : 8/29/2013

MICROCHIP				nation Base A				nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg Labeling e3
Semiconductor Device Typ	e: DC 05 (Lead	i) SOT-223 (N7)								
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	8.71	(mg) Total	Mold Compound	% ot Total Weight	52.77
Silica, vitreous	60676-86-0	Mold Compound	44.855	7.401	448,545		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.232	0.533	32,322		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.232	0.533	32,322		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.293	0.213	12,929		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.158	0.026	1,583		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	35.148	5.799	351,482			Total		
Iron	7439-89-6	Lead Frame	0.865	0.143	8,646	6.07	(mg) Total	Lead Frame	% of Total Weight	36.79
Silver	7440-22-4	Lead Frame	0.701	0.116	7,008		Copper	7440-50-8	95.54	·
Zinc	7440-66-6	Lead Frame	0.046	0.008	460		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.030	0.005	304		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.667	0.110	6,673		Zinc	7440-66-6	0.13	
Proprietary Resin	Trade Secret	Die Attach	0.157	0.026	1,573		Phosphorous	7723-14-0	0.08	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.026	0.004	255			Total		
Silicon	7440-21-3	Chip (Die)	1.030	0.170	10,300	0.14	(mg) Total	Die Attach	% of Total Weight	0.85
Gold	7440-57-5	Wire Bond	0.550	0.091	5,500		Silver (Ag)	7440-22-4	79	
Tin	7440-31-5 F	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	8.010	1.322	80,100		Proprietary Resin	Trade Secret	19	
		TOTALS:	100.000	16.500	1,000,000	Proprietar	ry Curing agent & Hardener	Trade Secret	3	
	0.0165 a	Total Mass						Total	100.00	
02/53/EC (End-of-Life Vehicles (ELV) Directive).	y with EU Directive 200	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Direc	tive) and with	EU Directive	0.17	Total (mg)	Chip (Die)	% of Total Weight	1.03
is semiconductor device and its homogenous materials compl 02/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic	y with EU Directive 200 ternal design controls, al substance is NOT an	22/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and	to the best of	, Microchip Tec	hnology	0.17	Total (mg) Doped Silicon		% of Total Weight	1.03
02/53/EC (End-of-Life Vehicles (ELV) Directive). Ompliance with the above EU Directives has been verified via in	y with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible ry scheme world-wide. ability standard for pla	p2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity conce	to the best of l	Microchip Tec chemical subs	hnology	0.17		Chip (Die) 7440-21-3	% of Total Weight	0.55
02/53/EC (End-of-Life Vehicles (ELV) Directive). In propilance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic: corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulato biding compounds used by Microchip meet the UL94 V0 flamm.	y with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credibl y scheme world-wide. ability standard for pla- stics/	p2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concestics. You can access the UL iQTM family of databases to	to the best of intration of the co	Microchip Tec chemical subs	hnology tance, if any,		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	
02/53/EC (End-of-Life Vehicles (ELV) Directive). compliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this document below the threshold of regulatory concern for any regulatory concern for any regulatory concern for any regulatory concern for any regulatory conding compounds used by Microchip meet the UL94 V0 flammers. (Full Com/global/eng/pages/offerings/industries/chemicals/plate protective "tubes" in which the specific product is shipped a	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credibly y scheme world-wide. ability standard for pla- stics/ ere made from polyviny his form concerning su is knowledge and belie en compiled based on and some information m and the average weight	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concestics. You can access the UL iQTM family of databases to the concestics of the concestics of the concestic of anticipated significant toxic metals components. The	to the best of ontration of the coordinates of the packing occupanted is significant of the properties	Microchip Techemical substreport at slip on the outericonductor cannot guara aterial supplies. In	chnology tance, if any, ater box and r devices in intee the rs. Supplier iformation is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total	% of Total Weight 100 100.00 % of Total Weight	
02/53/EC (End-of-Life Vehicles (ELV) Directive). In population with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docum not below the threshold of regulatory concern for any regulatory concern for any regulatory compounds used by Microchip meet the UL94 V0 flammitp://ul.com/global/eng/pages/offerings/industries/chemicals/plate protective "tubes" in which the specific product is shipped a retain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in the protection of the specific product is shipped a crain in the form protection of the protect of the best of its impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets at oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of these parts as oxided only as estimates of the average weight of the average weight of th	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credibli- y scheme world-wide. ability standard for pla- stics/ tre made from polyviny his form concerning su is knowledge and belie en compiled based on ald some information in nd the average weight con devices (silicon IC	supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concerts: I chloride (PVC) plastic. "Window envelopes" used to be betances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets pro up not have been provided by subcontract assemblers of anticipated significant toxic metals components. The lin the finished parts. with respect to the information provided in this declarat	to the best of ontration of the coordinates of the packing oncorporated's sylncorporated indicates of the packing and raw materiase estimates do to the packing of the pack	Microchip Techemical substreport at slip on the outer cannot guara aterial supplies al suppliers. In o not include the sive, limited presented sive, limited presented substress limited presented sive, limited presented substress limited presented substress limited presented substress limited substress limited substress limited presented substress limited presented substress limited substrates limited presented substrates limited substrates limite	chnology tance, if any, atter box and r devices in intee the rs. Supplier information is trace levels		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight	
one of the control of the protection of the prot	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credibly y scheme world-wide. ability standard for pla- stics/ re made from polyviny his form concerning su is knowledge and belie en compiled based on d some information in and the average weight con devices (silicon IC ty, express or implied, is subsidiaries are con es to Material Content	supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concestics. You can access the UL iQTM family of databases to I chloride (PVC) plastic. "Window envelopes" used to he obstances restricted by RoHS in Microchip Technology Information of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provay not have been provided by subcontract assemblers of anticipated significant toxic metals components. The of in the finished parts. with respect to the information provided in this declaratianed in Microchip's standard terms and conditions of Declarations and shall not be liable for any damages, di	to the best of intration of the coordinates of the packing incorporated's syluncorporated ided by raw mand raw materiase estimates do ion. The exclusion. The exclusion are the coordinates are rect or indirect,	Microchip Tecchemical substreport at slip on the outermiconductor cannot guaraterial supplies al suppliers. In o not include the sive, limited provided in Microsequential consequential consequential suppliers.	thnology tance, if any, refer box and refer devices in intee the rs. Supplier formation is trace levels	0.09	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.55

DC 5 SOT-223 11:12 AM : 8/29/2013

ICROCHIP				nation Base A pper Alloy (C				ogeneous Materials: .g. pc boards, display	vs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Typ	e: OS 05 (Lead)	TSOT (L9)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	7.99	(mg) Total	Mold Compound	% ot Total Weight	62.42
							Silica, vitreous	60676-86-0	85.00	
Silica, vitreous	60676-86-0	Mold Compound	53.057 3.823	6.791	530,570 38,232					
Epoxy Resin (No bromine, No diantimony trioxide) Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret Trade Secret	Mold Compound Mold Compound	3.823	0.489	38,232		Epoxy Resin Phenolic Resin	Trade Secret Trade Secret	6.13 6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.529	0.196	15,293		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.187	0.024	1,873		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	25.585	3.275	255,849			Total	100.00	Ц
Iron	7439-89-6	Lead Frame	0.629	0.081	6,293	3.43	(mg) Total	Lead Frame	% of Total Weight	
Silver	7440-22-4	Lead Frame	0.510	0.065	5,102		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.033	0.004	335		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.022	0.003	221		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	1.531	0.196	15,308		Zinc	7440-66-6	0.13	
Proprietary Resin	Trade Secret	Die Attach	0.361	0.046	3,608		Phosphorous	7723-14-0	0.08	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.059	0.007	585			Total	100.00	<u> </u>
Silicon	7440-21-3	Chip (Die)	5.340	0.684	53,400	0.25	(mg) Total	Die Attach	% of Total Weight	1.95
		1,7,7								
Gold	7440-57-5	Wire Bond	0.400	0.051	4,000		Silver (Ag)	7440-22-4	79	
Tin	7440-31-5 Pla	ting on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	3.110	0.398	31,100		Proprietary Resin	Trade Secret	19	
		TOTALS:	100.000	12.800	1,000,000	Proprietary	Curing agent & Hardener	Trade Secret	3	
	0.0128 a	Total Mass						Total	100.00	_
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via in	ternal design controls, s			·		0.68	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight	5.34
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via in emical substance is absent from the list above, the chemic orated's knowledge and belief as of the date of this docum	ternal design controls, s al substance is NOT an i ent, there is no credible	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conce	, to the best of	Microchip Tec	chnology	0.68	, ,,	7440-21-3	100	5.34
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via in emical substance is absent from the list above, the chemical sorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regular compounds used by Microchip meet the UL94 V0 flammar.	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide.	, to the best of ntration of the	Microchip Tec chemical subs	chnology	0.68	, ,,	7440-21-3	100	
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive). iance with the above EU Directives has been verified via intermical substance is absent from the list above, the chemical substance is absent from the list above, the chemical rate of this document of the content of this document below the threshold of regulatory concern for any regular group compounds used by Microchip meet the UL94 V0 flammaticom/global/eng/pages/offerings/industries/chemicals/plastotective "tubes" in which the specific product is shipped a	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. cs. You can access the UL iQTM family of databases t	, to the best of ntration of the o obtain a test	Microchip Tec chemical subs	chnology tance, if		Doped Silicon	7440-21-3 Total	100	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in memical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulatory concern	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/ re made from polyvinyl o	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. cs. You can access the UL iQTM family of databases to the chloride (PVC) plastic. "Window envelopes" used to he	i, to the best of ntration of the o obtain a test	Microchip Techemical subs	chnology tance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in hemical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docum- is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma /ul.com/global/eng/pages/offerings/industries/chemicals/plation protective "tubes" in which the specific product is shipped a in "reels" may be made from PVC plastic. pochip Technology Incorporated believes the information in the original packing materials is true and correct to the best of in pleteness and accuracy of data in this form because it has be mation is often protected from disclosure as trade secrets and povided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained with	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/ re made from polyvinyl of his form concerning subs ts knowledge and belief, sen compiled based on t and some information ma is and the average weigh	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity concerde. In the concern of t	, to the best of ntration of the o obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw materi	Microchip Tec chemical subs report at g slip on the out semiconductor d cannot guara naterial supplie	chnology tance, if heter box and r devices in antee the ers. Supplier offormation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via in the mical substance is absent from the list above, the chemical porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulatory concer	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/ re made from polyvinyl of his form concerning substs knowledge and belief, een compiled based on t nd some information may a and the average weigh hin silicon devices (silico	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. cs. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to be stances restricted by RoHS in Microchip Technology Ir as of the date listed in this form. Microchip Technology is ranges provided in Material Safety Data Sheets pro ynot have been provided by subcontract assemblers at of anticipated significant toxic metals components. Ton IC) in the finished parts.	i, to the best of intration of the o obtain a test old the packing incorporated's and incorporated in the packing incorporate	Microchip Tec chemical subs report at semiconductor d cannot guara- naterial supplie ial suppliers. In s do not include sive, limited pi	chnology tance, if heter box and r devices in antee the ers. Supplier aformation le trace		Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.4
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified via intermined in the properties of the date of this documes not below the threshold of regulatory concern for any regular or control of the date of this documes not below the threshold of regulatory concern for any regular or control of the date of this documes not below the threshold of regulatory concern for any regular or control of the date of this document of the date of the dat	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/ re made from polyvinyl o his form concerning subs ts knowledge and belief, een compiled based on ti nd some information may s and the average weigh hin silicon devices (silico ty, express or implied, w ts subsidiaries are conta es to Material Content D es et o Material Content D	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. cs. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he stances restricted by RoHS in Microchip Technology In as of the date listed in this form. Microchip Technology In the total provided in Material Safety Data Sheets pro y not have been provided by subcontract assemblers at of anticipated significant toxic metals components. To in IC) in the finished parts. ith respect to the information provided in this declaratined in Microchip's standard terms and conditions of ecclarations and shall not be liable for any damages, dieclarations and shall not be liable for any damages, dieclarations.	i, to the best of intration of the coordinate of the packing incorporated's gy incorporate vided by raw in and raw materi'hese estimate tion. The exclusale. These are rect or indirect or indirect	Microchip Tecchemical substance of the content of t	chnology tance, if ter box and r devices in antee the ers. Supplier formation le trace	0.05	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100	0.4
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intermical substance is absent from the list above, the chemical substance is absent from the list above, the chemical production of the date of this docume is not below the threshold of regulatory concern for any regular ground grounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/platerotective "tubes" in which the specific product is shipped an "reels" may be made from PVC plastic. This Technology Incorporated believes the information in the original packing materials is true and correct to the best of interess and accuracy of data in this form because it has be nation is offen protected from disclosure as trade secrets and vided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained with the provided by Microchip Technology Incorporated and interest	ternal design controls, s al substance is NOT an i ent, there is no credible ulatory scheme world-wi ability standard for plasti stics/ re made from polyvinyl o his form concerning subs ts knowledge and belief, een compiled based on ti nd some information may s and the average weigh hin silicon devices (silico ty, express or implied, w ts subsidiaries are conta es to Material Content D es et o Material Content D	upplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. cs. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he stances restricted by RoHS in Microchip Technology In as of the date listed in this form. Microchip Technology In the total provided in Material Safety Data Sheets pro y not have been provided by subcontract assemblers at of anticipated significant toxic metals components. To in IC) in the finished parts. ith respect to the information provided in this declaratined in Microchip's standard terms and conditions of ecclarations and shall not be liable for any damages, dieclarations and shall not be liable for any damages, dieclarations.	i, to the best of intration of the coordinate of the packing incorporated's gy incorporate vided by raw in and raw materi'hese estimate tion. The exclusale. These are rect or indirect or indirect	Microchip Tecchemical substance of the content of t	chnology tance, if ter box and r devices in antee the ers. Supplier formation le trace	0.05	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matter Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.4

OS 5 TSOT 11:12 AM : 8/29/2013

Contained in Vicinal Sub-Component Vicinal Sub-Component Vicinal Sub-Component Vicinal Sub-Component Vicinal Sub-Component Vicinal Sub-Component Vicinal Vic	MICROCHIP Semiconductor Device Type	: IB 03/10ad/	SC-70 (R2 / R)		nation Base / pper Alloy (C	•			ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Select Color Select Color Select Color Select Color Select Color Select			"Contained In"		T .		4 39	(mg) Total	Mold Compound	% of Total Weight	
Figure Floor Piet Internation Trade Secret Model Compound 4.886 0.269 48,071	***************************************		•					,			01.00
Principle (Page (Pig Br C) (SSC) No distribution (procedo) Traps Secret Story (Pig Br C) (SSC) No distribution (procedo) Traps Secret Story (Pig Br C) (SSC) St											
Epoxy Create Meades 29696-82-2 Mode Compound 1,958 1,058 13,551 1,551											
Cathon Black											
Copger											
Initial 1309-37-1							l l	Odibon Black		****	
Zen Priosphale Priosph							0.58	(mg) Total			5.68
Properties 1772-14-0 Lead Farme							0.00				5.00
Silver 7440-22-4 Lead Frame 0.008 0.000 11 Properties (1440-22-4 Lead Frame 0.008 0.000 11 Properties (1440-22-4 144											
Chapter Chap											
Lead 7439-92-1 Lead Frame 0,000 0,000 11 Cadmitum 7440-329 Lead Frame 0,000 0,000 11 Proprietary Curing agent A leader 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1											
Cadmium 7440-254 De Attach 0.598 0.050 13 Sher (AD) 7440-255 De Attach 0.598 0.050 12.500 De Attach											
Silver (Ag) 7440-22-4 De Attach 0.589 0.032 5.888 Proprietary Near Secret 1 De Attach 0.139 0.008 1.388 Proprietary Near Secret 1 De Attach 0.139 0.008 1.388 Proprietary Near Secret 1 De Attach 0.022 0.001 0.001 1.200 0.001 0.00											
Proprietry Curing agent & Hardener Tasks Secret De Attach 0.138 0.008 1,388 Proprietry Curing agent & Hardener Tasks Secret De Attach 0.023 0.001 225 0.001						5.888					
Silicon 7440;21:3 Chip (Dia) 7500 1, 200 1,	Proprietary Resin	Trade Secret	Die Attach		0.008					0.00	
Silicon 7440;21:3 Chip (Dia) 7500 1, 200 1,	Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.023	0.001	225			Total	100.00	
Time To 1940-31-5 Relating one-internal selection 1970 (1940-1975) Relating to enternal selection 1970 (1940-1975) Relating to	Silicon	7440-21-3	Chip (Die)	7.500	0.413	75,000	0.04	(mg) Total	Die Attach	% of Total Weight	0.51
Time Type of the properties of	Gold	7440-57-5	Wire Bond	0.200	0.011	2.000		Silver (Aa)	7440-22-4	79	
TOTALS: 100.000 5.500 1,000.000 Total Mass Dependence on the Market Market Market Mass Total Mass Total Mass Total Mass Total Mass Total Mass Total Mass Dependence With the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Total Mass Total Mass Dependence With Market Mass Total Mass Total Mass Dependence With Market Market Mass Total Mass Dependence With Market Mass Total Mass Total Mass Dependence With Market Market Market Mass Total Mass	Tin					12,500		Proprietary Resin	Trade Secret		
is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU ordinary control of the Children of the Vehicles (ELV) Directive), mpliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. Doped Silicon 7440-21-3 100. Doped Silicon 7440-21-3 100.00 Total (mg) Tot			TOTALS:	100.000	5.500	1,000,000	Proprietary	Curing agent & Hardener		3	
is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU ordinary control of the Children of the Vehicles (ELV) Directive), mpliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. Doped Silicon 7440-21-3 100. Doped Silicon 7440-21-3 100.00 Total (mg) Tot		0.0058	n Total Mass						Total	100.00	
the chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if y, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Indiging compounds used by Microchip meet the UL-94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at p.//ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ Indiging compounds used by Microchip meet the UL-94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at p.//ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ Indiging compounds used by Microchip meet the UL-94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at the control of the chemical substance, if y, is not believe the test of the indiging of the control of the chemical substance, if y, is not believe the unavoidable impurity concentration of the chemical substance, if y, is not believe the UL-94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at the control of the chemical substance, if y, is not believe the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurity concentrated to obtain a test report at the unavoidable impurit		with EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (R	oHS Recast Di	rective) and w	rith FU					
proporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if you is not below the threshold of regulatory concern for any regulatory scheme world-wide. 10.01 (mg) Total Wire Bond % of Total Weight 3	meduve 2002/33/EC (End-OI-Lile Venicles (ELV) Directive).				•	20	0.41	Total (mg)	Chip (Die)	% of Total Weight	0.51
d certain "reels" may be made from PVC plastic. Total 100.00 Total 100	compliance with the above EU Directives has been verified via inte	ū	•	45-45-54	- 6 Mai Indian		0.41		7440-21-3	100	0.51
crochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee e completeness and accuracy of data in this form because it has been compiled based on the ranges provided by subcontract assemblers and raw material suppliers. ormation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. ormation is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not elude trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. **Corochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product transport of the provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in a corochip's quotations, sales order acknowledgement, and invoices. **Total Weight** **Of Total Weight** **Solve** **Of Total Weight** **Solve** **Total Weight**	compliance with the above EU Directives has been verified via inte a chemical substance is absent from the list above, the chemical acorporated's knowledge and belief as of the date of this docume ny, is not below the threshold of regulatory concern for any regul lolding compounds used by Microchip meet the UL94 V0 flammat	substance is NOT a nt, there is no credil atory scheme world bility standard for pla	n intentional ingredient in the semiconductor device a ble reason to believe that the unavoidable impurity con -wide.	centration of the	ne chemical s	Technology		Doped Silicon	7440-21-3 Total	100	
Incorporated does in the Provided by Microschip Technology Incorporated does in the Provided in Microschip's standard terms and conditions of sale. These are provided in microschip's quotations, sales order acknowledgement, and invoices. O.07 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 1 hour % of Total Weight 52.92 for the Provided in Microschip's quotations, sales order acknowledgement, and invoices. Tin 7440-31-5 100.00 of this Certificate of Compliance for semiconductor products.	compliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical recorporated's knowledge and belief as of the date of this docume my, is not below the threshold of regulatory concern for any regul lolding compounds used by Microchip meet the UL94 V0 flammat ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plast	substance is NOT a nt, there is no credil latory scheme world bility standard for platics/	n intentional ingredient in the semiconductor device a ole reason to believe that the unavoidable impurity con wide. astics. You can access the UL iQTM family of database:	centration of the	ne chemical si	Technology ubstance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100.00 100.00 % of Total Weight	
nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00 of this Certificate of Compliance for semiconductor products.	compliance with the above EU Directives has been verified via interaction and chemical substance is absent from the list above, the chemical accorporated's knowledge and belief as of the date of this docume my, is not below the threshold of regulatory concern for any regul lolding compounds used by Microchip meet the UL94 V0 flammat ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plass/the protective "tubes" in which the specific product is shipped are not certain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the information in this in their original packing materials is true and correct to the best of the completeness and accuracy of data in this form because it has upplier information is often protected from disclosure as trade se information is provided only as estimates of the average weight of	substance is NOT a nt, there is no credi atory scheme world bility standard for platics/ e made from polyvin s form concerning s its knowledge and is been compiled bas crets and some info	an intentional ingredient in the semiconductor device a ole reason to believe that the unavoidable impurity con- wide. astics. You can access the UL iQTM family of database: yl chloride (PVC) plastic. "Window envelopes" used to ubstances restricted by RoHS in Microchip Technology belief, as of the date listed in this form. Microchip Tech ed on the ranges provided in Material Safety Data Shee ormation may not have been provided by subcontract a average weight of anticipated significant toxic metals of	centration of the stood of the packing of the packi	ne chemical si st report at ng slip on the 's semiconduc orated cannot r raw material r raw material	Technology ubstance, if outer box ctor devices guarantee suppliers. suppliers.		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
Total 100.00	compliance with the above EU Directives has been verified via interaction and chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical acorporated's knowledge and belief as of the date of this docume my, is not below the threshold of regulatory concern for any regulation in the substance of the substan	substance is NOT a nt, there is no credit latory scheme world bility standard for platics/ e made from polyvin s form concerning s its knowledge and is been compiled base crets and some info these parts and the ontained within silicon to, express or implied is subsidiaries are co	an intentional ingredient in the semiconductor device a ble reason to believe that the unavoidable impurity con-wide. astics. You can access the UL iQTM family of databases by Ichloride (PVC) plastic. "Window envelopes" used to ubstances restricted by RoHS in Microchip Technology belief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Shee ormation may not have been provided by subcontract a average weight of anticipated significant toxic metals con devices (silicon IC) in the finished parts.	s to obtain a te hold the packi y Incorporated nology Incorporates provided by ssemblers and components. T	st report at Ing slip on the Is semiconduc Ir aw material	Technology ubstance, if outer box ctor devices guarantee suppliers. suppliers. set do not	0.01	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	3
	compliance with the above EU Directives has been verified via interaction as a chemical substance is absent from the list above, the chemical acorporated's knowledge and belief as of the date of this docume my, is not below the threshold of regulatory concern for any regulatory, is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is not below the threshold of regulatory concern for any regulatory. It is shipped are not certain "reels" may be made from PVC plastic. It is rechip Technology Incorporated believes the information in this in their original packing materials is true and correct to the best of the completeness and accuracy of data in this form because it has upplier information is often protected from disclosure as trade set information is provided only as estimates of the average weight of include trace levels of dopants, metals, and non-metal materials continued in the continued of the co	substance is NOT a nt, there is no credit atory scheme world bility standard for platics/ e made from polyvin as form concerning s its knowledge and is been compiled basicrets and some information of these parts and the pontained within silicon, express or implied a subsidiaries are costs.	an intentional ingredient in the semiconductor device a ble reason to believe that the unavoidable impurity con-wide. astics. You can access the UL iQTM family of databases by Ichloride (PVC) plastic. "Window envelopes" used to substances restricted by RoHS in Microchip Technology belief, as of the date listed in this form. Microchip Technology obelief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Shee ormation may not have been provided by subcontract a average weight of anticipated significant toxic metals con devices (silicon IC) in the finished parts. (4), with respect to the information provided in this declar intained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages,	s to obtain a te hold the packi y incorporated nology incorporates provided by ssemblers and components. T	st report at ng slip on the s semiconduc orated cannot r raw material r aw material chese estimate clusive, limited are provided i	Technology ubstance, if outer box ctor devices guarantee suppliers. suppliers. sid o not di product n	0.01	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 7440-31-5	100 100.00 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	3

LB 3 SC-70 11:12 AM : 8/29/2013

Basic Substance (AS Number Sub-Component Weight mg/gart ppm Siles virtues (AS Number Sub-Component Weight mg/gart ppm Siles virtues (AS Number Sub-Component Substance Substance Substance (AS Number Sub-Component Substance Subs	ЛІСЯОСНІР				nation Base A	. ,		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Basic Substance	Semiconductor Device Type	: LT 05 (Lead)	` '								e3
Epow Rein No Isotratino, Volateriamony Insolated immorphisms (No Isotratino, No Isotratino, Volateria) (1904) Physicis France Note 1 (1904) Physicis France	Basic Substance	CAS Number			mg/part	ppm	2.59	(mg) Total	Mold Compound	% ot Total Weight	41.18
Primotic Ream (No. 17.4 (1997) 1. Control (1997)	Silica, vitreous	60676-86-0	Mold Compound	35.003	2.205	350,030		Silica, vitreous	60676-86-0	85.00	
Egovy Circus Novides											
Carbon Black											
Copper 7440-50-6 Lead Frame 0.65 0.41 0.63 0.41 0.63 0.41 0.63 0.41 0.41 0.63 0.41 0.41 0.63 0.41 0.4											
Silver 7,440,22-24 Lead Frame 0,183 0,010 1,831 0,44 mg Total Lead Frame 5,01 Foot Weight 6,94 Minor 1,440,656,6 Lead Frame 0,000 1,								Carbon Black			<u>J</u>
Sher 7440-224 Lead Frame 0.132 0.008 1,322 500 7440-234 2.55 7400-244 1.55 7400-											
And Procephorous 7723-14-0 Lead Frame 0.009 0.001 87 Procephorous 7723-14-0 Lead Frame 0.009 0.000 57 Process 0.000 1 Process	-					,	0.44				6.94
Phosphorous Projective Wiles (Etc.) Projective Cend-of-Life Vehicles (EU, Directive). Solver (Ros) Projective Wiles have been everified via internal design controls, supplier declarations, and for analytical test data. Projective Wiles (Exp.) Directive Wiles (EU, Directive) best of the date of this document, there is no credible reason to believe that the unavoidable improject on which the spherider prosective Turbude are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing align on the outer box and lain "receips" and non-metal materials contained within silicon devices, (ellicon IC) in the finished parts. Projective Wiles (EU, Directive) and in this form because it has been compiled based on the ranges provided of Microchip's Technology Incorporated does not provide any warranty, express or implied, with respect to the best of this form because it has been compiled based on the ranges provided of Microchip's Technology Incorporated does not provide any warranty, express or implied, with respect to the information or material suppliers. Suppliers said to concein the containing of the content of the con											
Silvier (Ag) 17440-52-4 Die Attach 0.783 0.050 7.929 Proprietary Werin agent & Hardener 17440-52-5 Die Attach 0.167 0.050 0.002 303 Total Mass Control (Proprietary Curring agent & Hardener 17440-51-5 No.000 1.0											
Proprietary Keepin Trade Secret Die Attach 0.187 0.112 1.889 Proprietary Curing apent & Hardener Trade Secret Die Attach 0.030 0.002 303 Total 1.690 Proprietary Curing apent & Hardener Trade Secret Die Attach 0.030 0.002 303 Proprietary Curing apent & Hardener Trade Total 100.000 Proprietary Resign Total 100.000 P											
Proprietary Curing agent & Hardener Trade Secret Die Attach 0.030 0.002 303 0.008 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 14,100 0.089 0.080											
Silicon 7440-21-3 Chip (Die) 1.410 0.089 14,100 0.08 (mg) Total Die Attach 7-6 Total Weight 1.01								Phosphorous			<u> </u>
Gold 7440-57-5 Wire Bond 10-000 0-000 0-00000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-00000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-00000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-00000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-0000 0-00000 0-0000 0											
Deposition (Part of the Secret 19) Total (Secret 19) Output 19 Propretery Resist 1 Trads Secret 19 Output 19 Propretery Resist 1 Trads Secret 19 Total 100.00 Total (Inc.) Doped Silicon 7440-21-3 100 Doped Silicon 7440-21-3 100 Doped Silicon 7440-21-3 100 Doped Gold 7440-21-5 100 Doped Gold 744	Silicon	7440-21-3	Chip (Die)			14,100	0.06	(mg) Total	Die Attach	% of Total Weight	1.01
O.0063 g Total Mass O.0064 g Total Weight O.0066 g Total Weight O.0066 g Total Weight O.0066 g Total Weight O.0066 g											
O.0063 g Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/98/EC (End-of-Life Vehicles (ELV) Directive). npliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology proprated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidedge and belief as of the date of this document, there is no credible reason to believe that the unavoidedge and belief as of the date of this document, there is no credibly standard for plastics. You can access the UL iQTM family of databases to obtain a test report at the virtual complete of the chemical substance is always and the product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and lain "reals" may be made from PVC plastic. rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the publication of the ranges provided in Material State components. These estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates of the average weight of these parts and the average weight of articipated significant toxic metals components. These estimates of the average weight of the packing and the average weight of articipated significant toxic metals components. These estimates of the average weight of the packing and the a	Tin	7440-31-5									
s semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU Directive 2011/85/EU (RoHS Recast Directive) and the substance and the substance is above 10.00.00 Total (mg) To			TOTALS:	100.000	6.300	1,000,000	Proprietary	Curing agent & Hardener	Trade Secret	•	
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 1.41		0.0063	g Total Mass						Total	100.00	Ī
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and in "receis" may be made from PVC plastic. Total 100.00 (mg) Total Wire Bond % of Total Weight 0.93 Doped Gold 7440-57-5	tive 2002/33/EC (End-of-Life vehicles (ELV) Directive).						0.09	i otal (mg)	Chip (Die)	% of Total Weight	1.41
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and arin "reels" may be made from PVC plastic. Total Doped Gold 7440-57-5 100 Doped Gold 7440-57-5 100 Doped Gold 7440-57-5 100 Total Total 100.00 Total Total Total 100.00 Total Total Total Total 100.00 Total To	, , , ,	ernal design control	s, supplier declarations, and /or analytical test data.				0.09		7440-21-3	100	
in "reels" may be made from PVC plastic. Doped Gold T440-57-5 100	pliance with the above EU Directives has been verified via inte chemical substance is absent from the list above, the chemical rporated's knowledge and belief as of the date of this documen	substance is NOT nt, there is no credi	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concer				0.09		7440-21-3	100	
ochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier mation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information ovided only as estimates of the average weight of these parts and the average weight of t	pliance with the above EU Directives has been verified via inte chemical substance is absent from the list above, the chemical rporated's knowledge and belief as of the date of this documen is not below the threshold of regulatory concern for any regul ting compounds used by Microchip meet the UL94 V0 flammab	substance is NOT nt, there is no credi atory scheme work	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert-wide.	ntration of the	chemical subs			Doped Silicon	7440-21-3 Total	100	
Inpleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier remation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information rovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace self-self-self-self-self-self-self-self-	npliance with the above EU Directives has been verified via inte chemical substance is absent from the list above, the chemical proprated's knowledge and belief as of the date of this documer, is not below the threshold of regulatory concern for any regul ding compounds used by Microchip meet the UL94 V0 flammab://ul.com/global/eng/pages/offerings/industries/chemicals/plast	substance is NOT nt, there is no credi atory scheme work bility standard for pl icics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert- divide. astics. You can access the UL iQTM family of databases t	ntration of the	chemical subs	stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's tations, sales order acknowledgement, and invoices. 1.06 (mg) Total leads (pins) - Matte Tin / annealed at 150°C for 1 hour 1.00 (mg) Total Weight 48.53 2.06 (mg) Total weight 48.53 2.07 (mg) Total weight 48.53 2.08 (mg) Total weight 48.53 2.09 (mg) Total weight 48.53 2.00 (mg) Total weight 48.53	npliance with the above EU Directives has been verified via inte chemical substance is absent from the list above, the chemical proporated's knowledge and belief as of the date of this documer, is not below the threshold of regulatory concern for any regul ding compounds used by Microchip meet the UL94 V0 flammab://ul.com/global/eng/pages/offerings/industries/chemicals/plast protective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic.	substance is NOT nt, there is no credi atory scheme work bility standard for pl tics/ e made from polyvin	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert-wide. astics. You can access the UL iQTM family of databases to have choiced (PVC) plastic. "Window envelopes" used to have substances restricted by RoHS in Microchip Technology In	ntration of the o obtain a test old the packing	chemical substruction of the or structure of the or semiconducto	stance, if uter box and r devices in		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.93
erwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or his Certificate of Compliance for semiconductor products.	mpliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabo://ul.com/global/eng/pages/offerings/industries/chemicals/plasterprotective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information in this ir original packing materials is true and correct to the best of its inpleteness and accuracy of data in this form because it has been ormation is often protected from disclosure as trade secrets and provided only as estimates of the average weight of these parts	substance is NOT nt, there is no credi atory scheme work bility standard for pl tics/ e made from polyvin s form concerning s s knowledge and be en compiled based of d some information and the average we	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert-wide. astics. You can access the UL iQTM family of databases to a local content of the content of	o obtain a test old the packing accorporated's a gy Incorporate vided by raw n and raw materi	report at g slip on the or semiconducto d cannot guar naterial suppli	stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.93
Total 100.00	mpliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical proporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammaths/l/ul.com/global/eng/pages/offerings/Industries/chemicals/plast or protective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this ir original packing materials is true and correct to the best of its inpleteness and accuracy of data in this form because it has been material in the protected from disclosure as trade secrets and provided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained within trochip Technology Incorporated does not provide any warranty	substance is NOT nt, there is no credi atory scheme work illity standard for pl tics/ e made from polyvin s form concerning s s knowledge and be en compiled based d some information and the average we n silicon devices (s	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert-wide. astics. You can access the UL iQTM family of databases to a string in the context of the co	o obtain a test old the packing acorporated's a gy Incorporate vided by raw n and raw mater 'hese estimate	report at g slip on the or semiconducto d cannot guar naterial suppli ial suppliers. I s do not inclu-	uter box and r devices in antee the ers. Supplier nformation de trace	0.06	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 100.00 % of Total Weight 100 100.00	0.93
	mpliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical proporated's knowledge and belief as of the date of this document, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabit/ful.com/global/eng/pages/offerings/industries/chemicals/plastic protective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information in this fir original packing materials is true and correct to the best of its its rupileteness and accuracy of data in this form because it has bornation is often protected from disclosure as trade secrets and rovided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained within prochip Technology Incorporated does not provide any warranty ranties provided by Microchip Technology Incorporated and its otations, sales order acknowledgement, and invoices.	substance is NOT nt, there is no credi atory scheme work bility standard for pl tics/ e made from polyvi s form concerning s s knowledge and be ben compiled based of d some information and the average we n silicon devices (s or, express or implie t subsidiaries are co s to Material Conter	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concert-wide. astics. You can access the UL iQTM family of databases to a stick. You can access the UL iQTM family of databases to a stick the control of the control	o obtain a test old the packing accorporated's: gy Incorporate vided by raw n and raw mater hese estimate cion. The exclu sale. These are	report at g slip on the or semiconducto d cannot guar naterial suppli ial suppliers. I s do not inclu- sive, limited p e provided in I	stance, if Interpolation and antee the ers. Supplier information de trace roduct Microchip's al or	0.06	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 100.00 % of Total Weight 100 100.00 % of Total Weight	0.93

LT 5 SC-70 11:12 AM : 8/29/2013

Basic Substance	ICROCHIP				nation Base A				ogeneous Materials: g. pc boards, display	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Size Proposition CAS Number Sub-Component Weight Might M	Semiconductor Device Type:	LT or LTY 05 (Lead) SC									e4
Silea, vireous	Basic Substance	CAS Number			malnart	nnm	3.94	(mg) Total	Mold Compound	% ot Total Weight	62.53
Epony Resin			•					Silica vitroous	60676-86-0	95.00	
Princic Renin Trade Secret Moto Compound 1,520 0,697 15,500											
Epoxy Chees Novoluck											
Carbon Black							i				
Final Table Lead Frame 0.087 0.037 5.867 141 (mol Total Lead Frame 0.084 0.004 838 Coppor 740-95-0 72.0 1.006					0.012		i				
Phosphorous 772-14-0 Lead Frame 0.038 0.004 6.98 brown 7440-66 0 Lead Frame 0.038 0.002 383 brown 7440-66 0 Lead Frame 0.038 0.002 383 brown 7440-66 0 Lead Frame 0.038 0.002 383 brown 7425-14 0 lead Frame 0.038 0.002 383 brown 7425-14 0 lead Frame 0.038 0.002 1.00											
Phosphorous							1.61	(mg) Total			25.51
Autonome	Phosphorous	7723-14-0	Lead Frame	0.064	0.004	638					
Debtymen Trade Scoret - 10114 De Attach 0.801 0.388 6.012 0.27		7440-66-0			0.002	383	i		7439-89-6		
Delethrene clycol manocathy ether accelate 112-15-2 De Attach De Attac							i				
Epoxy resin Trade Sources 1-0114 De Attach 0.328 0.021 3.279 Epoxy resin Trade Sources 1-0105 De Attach 0.164 0.010 1.40 0.11 (men) Total Die Attach 1.76 Arnine Trade Secret 1-0039 De Attach 0.066 0.004 655 Sistion 7440-213 Chip (Die) 7.520 0.0474 17.520 Nickel 7440-213 Chip (Die) 7.520 0.071 17.250 0.0							i				
Epoxy resin Trade Secret - 10105 De Attach Annie Trade Secret - 10105 De Attach Annie Trade Secret - 10105 De Attach Silcon 7 440-21-3 Chip (Die) 7,520 0,044 74 75,200 Child Trade Secret - 10105 Period Silcon 7 440-27-5 P							i				ļ!
Amine Trade Secret - 10039 Die Attach 0.066 Sicon 7440-213 Chip (Die) 7.520 O Sicon 7440-213 Chip (Die) 7.520 O O-474 7.5200 Die Nickel 7440-57-5 Wire Bond 1.4.30 0.090 14.300 Die Palanda (Die Nickel 7440-57-5 Die Nickel 7440-52-0 Palanda on external leads (pins) 1.125 0.071 1.125 Die Die Die Palanda (Die Nickel 7440-52-0 Palanda on external leads (pins) 1.125 0.071 1.125 Die		Trade Secret - 10105	Die Attach	0.164	0.010	1,640	0.11	(mg) Total	Die Attach	% of Total Weight	1 76
Silcon 7440-57-5 Wire Bond 14-30							<u> </u>				•
Solid 7440-97-5 Plating on external leads (pins) 1.1250 1.250 2.0071 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 1.250 2.0074 2.25 2.0074 1.250 2.0074 2.25 2.0074 1.250 2.0074 2.25 2.0074 2.0074 2.25 2.0074 2.0074 2.0074							Diethylene al				
Nickel 7440-02-0 Plating on external leads (pins) 1.125 0.071 11.250 Eppty ream Trade Secret -10105 9							Diotriyiono gr				
Palladium 5/37/440 Plating on external leads (pins) 0.063 0.004 625 Total Mass O.0063 g Total Mass S semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive). EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2012/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip hnology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip hnology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip hnology incorporated's semiconductor occurrent on a progulatory scheme world-wide. Identification of the chemical scheme world-wide. Identification of the chemical scheme world-wide in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated's semiconductor in provided only as estimates of the average weight of these parts and the average weight of these parts and the average weight of these parts and the average weight of microchip standard terms and conditions of s							1				
Gold 7440-57-5 Pilating on external leads (pins) 0.063 0.004 625 0.0063 g Total Mass 10TALS: 100,000 6.30 1,000,000 0.47 Total (mg) Chip (pile) % of Yotal Weight 7.52 0.0063 g Total Mass 0.009 (mg) Total Microchip Total 0.009 (mg) Total 0.009 (mg							i				
O.063 g Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU semicolar bubstance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip hnology incorporated is knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is absent from the list above, the chemical substance is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the control of the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical substance is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the control of the chemical substance is absent from the list above, the chemical substance is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the control of the chemical substance is absent from the list above, the chemical substance is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the control of the chemical substance is absent from the list above, the chemical substance is not below the threshold of regulatory concern for any regulatory scheme world-wide. In the control of the chemical substance is a substance is not below the three is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is absent from the chemical substance is absent from the chemical substance is a state of the chemical substance is a state of the chemical substance is a state of the chemical substance is not below the three is no credible reason to believe that the unavoidable impurity concentration of the chemical substance is a state of the chemical substance is a state of the chemical substance is a state of	Palladium						4				
O.0063 g Total Mass O.007 (mg) Total Mass O.007 (mg) Total Mass O.009 (mg) Total M				0.063	0.004	625			Total	100.00	
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rnd-S Directive), EU Directive 2011/65/EU (Rnd-S Recast Directive) and with EU plainance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 0.09 (mg) Total Wire Bond % of Total Weight 1.43 chemical substance is absent from the list above, the chemical substance is NoT an intentional ingredient in the semiconductor device and, to the best of Microchip chnology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical stance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. In comploading pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain "reels" may be made from PVC plastic. O.08 (mg) Total Plating on external leads (pins) O.08 (mg) Total Plating on external leads (pins) Nickel 740-02-0 90.00 Palladium 740-05-3 5.00			Plating on external leads (pins)				0.47	Total (mg)			7.52
Including Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical stance, if any, is not below the threshold of regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not below the threshold of regulatory concern for any regulatory scheme world-wide. It is not believe the threshold of regulatory concern for any regulatory scheme world-wide. It is not believe the threshold of regulatory concern for any regulatory scheme world-wide. It is not believe the threshold of regulatory concern for any regulatory concern for any regulatory concern for any department at the outer box of the date	Gold emiconductor device and its homogenous ma	7440-57-5 0.0063 g T terials comply with EU Directive	Plating on external leads (pins) TOTAL Total Mass	S: 100.000	6.300	1,000,000	0.47		Chip (Die) 7440-21-3	% of Total Weight 100	7.52
protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box discretain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. The planting on external leads (pins) The planting on external le	Gold semiconductor device and its homogenous ma ive 2002/53/EC (End-of-Life Vehicles (ELV) Dir	7440-57-5 0.0063 g T terials comply with EU Directive ective).	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/	S: 100.000 65/EU (RoHS Reca	6.300	1,000,000		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
certain "reels" may be made from PVC plastic. 0.08 (mg) Total leads (pins) % of Total Weight 1.25 1.	Gold semiconductor device and its homogenous ma ive 2002/53/EC (End-of-Life Vehicles (ELV) Din Iliance with the above EU Directives has been nemical substance is absent from the list abov tology Incorporated's knowledge and belief as	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contre e, the chemical substance is NO of the date of this document, the	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ ols, supplier declarations, and /or analytical test If an intentional ingredient in the semiconductor ere is no credible reason to believe that the unar	S: 100.000 65/EU (RoHS Recadata. device and, to the	6.300 st Directive) and the strong st	1,000,000 nd with EU		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
ices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot trantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material pileirs. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These mates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. rocchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in rocchip's quotations, sales order acknowledgement, and invoices.	Gold semiconductor device and its homogenous maive 2002/53/EC (End-of-Life Vehicles (ELV) Dir- liance with the above EU Directives has been semical substance is absent from the list abov tology Incorporated's knowledge and belief as ance, if any, is not below the threshold of regung compounds used by Microchip meet the UI	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contree, the chemical substance is NOT of the date of this document, the latory concern for any regulator.	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ pols, supplier declarations, and /or analytical test If an intentional ingredient in the semiconductor are is no credible reason to believe that the unar y scheme world-wide.	S: 100.000 55/EU (RoHS Recadata. device and, to the oidable impurity c	6.300 st Directive) and the strong of Microconcentration of the strong o	1,000,000 and with EU chip of the chemical		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	
ranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in rochip's quotations, sales order acknowledgement, and invoices. rochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or	Gold semiconductor device and its homogenous maive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been semical substance is absent from the list above loology Incorporated's knowledge and belief as ance, if any, is not below the threshold of regung compounds used by Microchip meet the Ulul.com/global/eng/pages/offerings/industries/rotective "tubes" in which the specific productive to the control of t	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contres, the chemical substance is NO of the date of this document, the latory concern for any regulator .94 V0 flammability standard for chemicals/plastics/	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ ols, supplier declarations, and /or analytical test of an intentional ingredient in the semiconductor ere is no credible reason to believe that the unary scheme world-wide. plastics. You can access the UL iQTM family of o	S: 100.000 55/EU (RoHS Recadata. device and, to the oidable impurity catabases to obtain	6.300 st Directive) and best of Microconcentration on a test report a	1,000,000 and with EU thip of the chemical	0.09	(mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total	% of Total Weight 100 100.00 % of Total Weight 100 100.00	1.43
	Gold semiconductor device and its homogenous maive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been semical substance is absent from the list above loology Incorporated's knowledge and belief as ance, if any, is not below the threshold of regung compounds used by Microchip meet the Ulul.com/global/eng/pages/offerings/industries/rotective "tubes" in which the specific producertain "reels" may be made from PVC plastic. Chip Technology Incorporated believes the intes in their original packing materials is true annote the completeness and accuracy of data i liers. Supplier information is often protected friers. Information is provided only as estimates	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contres, the chemical substance is NO1 of the date of this document, the latory concern for any regulator shemicals/plastics/ t is shipped are made from polywormation in this form concerning d correct to the best of its known this form because it has been com disclosure as trade secrets a of the average weight of these p	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ ols, supplier declarations, and /or analytical test of an intentional ingredient in the semiconductor re is no credible reason to believe that the unary y scheme world-wide. plastics. You can access the UL iQTM family of or rinyl chloride (PVC) plastic. "Window envelopes" substances restricted by RoHS in Microchip Te edge and belief, as of the date listed in this form compiled based on the ranges provided in Mater nd some information may not have been provide arts and the average weight of anticipated signi-	S: 100.000 65/EU (RoHS Recadata. device and, to the oldable impurity catabases to obtain used to hold the particular of the particular o	6.300 st Directive) and best of Microconcentration of a test report and a test report and a test report and a test provided by the seemblers and assemblers and a test provided by the seemblers are test provided by the seemblers	thip of the chemical at the outer box anductor ated cannot oy raw material d raw material	0.09	(mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	1.43
SS) or of this Certificate of Compliance for semiconductor products.	semiconductor device and its homogenous maive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been lemical substance is absent from the list above lemical substance is absent from the list above loology Incorporated's knowledge and belief as ance, if any, is not below the threshold of regung compounds used by Microchip meet the Ulul.com/global/eng/pages/offerings/industries/rotective "tubes" in which the specific produce retain "reels" may be made from PVC plastic. Inchip Technology Incorporated believes the interioriginal packing materials is true and the completeness and accuracy of data inters. Supplier information is often protected friers. Information is provided only as estimates ates do not include trace levels of dopants, muchip Technology Incorporated does not provinties provided by Microchip Technology Incorporated son to provinties provided by Microchip Technology Incorporated does not provided by Microch	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contres, the chemical substance is NOT of the date of this document, the latory concern for any regulator general substance of the average weight of these petals, and non-metal materials colle any warranty, express or impliporated and its subsidiaries are	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ ols, supplier declarations, and /or analytical test or an intentional ingredient in the semiconductor ere is no credible reason to believe that the unar y scheme world-wide. plastics. You can access the UL iQTM family of or inyl chloride (PVC) plastic. "Window envelopes" g substances restricted by RoHS in Microchip Te edge and belief, as of the date listed in this form compiled based on the ranges provided in Mater and some information may not have been provide earts and the average weight of anticipated signi ntained within silicon devices (silicon IC) in the in ed, with respect to the information provided in the	S: 100.000 65/EU (RoHS Recadata. device and, to the oldable impurity catabases to obtain used to hold the part of the composition of the composition of the part of the composition of	6.300 st Directive) and best of Microconcentration of a test report a backing slip on ated's semicology Incorpor ets provided bassemblers and accomponents.	at at the outer box anductor cated cannot yr aw material d raw material These anductor cated cannot or a cannot or	0.09	(mg) Total Doped Gold (mg) Total Nickel	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight 90.00	1.43
Total 100.00	semiconductor device and its homogenous maive 2002/53/EC (End-of-Life Vehicles (ELV) Directives has been semical substance is absent from the list above lology Incorporated's knowledge and belief as ance, if any, is not below the threshold of regung compounds used by Microchip meet the Ul ul.com/global/eng/pages/offerings/industries/rotective "tubes" in which the specific producertain "reels" may be made from PVC plastic. Inchip Technology Incorporated believes the intest in their original packing materials is true an intee the completeness and accuracy of data iters. Supplier information is often protected friers. Information is provided only as estimates ates do not include trace levels of dopants, muchip Technology Incorporated does not provinties provided by Microchip Technology Incorporated consumers and incomplete the completeness and accuracy of data iters. Information is provided only as estimates at the provided by Microchip Technology Incorporated does not provinties provided by Microchip Technology Incorporated acknowledgement in the provided by Microchip Technology Incorporated in the provided by Microchip Technolog	7440-57-5 0.0063 g T terials comply with EU Directive ective). verified via internal design contres, the chemical substance is NOT of the date of this document, the latory concern for any regulator. 94 V0 flammability standard for chemicals/plastics/ t is shipped are made from polywormation in this form concerning d correct to the best of its knowl or this form because it has been com disclosure as trade secrets a of the average weight of these petals, and non-metal materials colle any warranty, express or impliporated and its subsidiaries are sent, and invoices.	Plating on external leads (pins) TOTAL Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/ ols, supplier declarations, and /or analytical test of an intentional ingredient in the semiconductor ere is no credible reason to believe that the unar y scheme world-wide. plastics. You can access the UL iQTM family of or rinyl chloride (PVC) plastic. "Window envelopes' y substances restricted by RoHS in Microchip Te edge and belief, as of the date listed in this form compiled based, as of the date listed in this form compiled based on the ranges provided in Mater nd some information may not have been provide arts and the average weight of anticipated signi ntained within silicon devices (silicon IC) into the ed, with respect to the information provided in the contained in Microchip's standard terms and con ent Declarations and shall not be liable for any de	S: 100.000 55/EU (RoHS Reca data. device and, to the oidable impurity c atabases to obtain used to hold the p chnology Incorpor Microchip Techn al Safety Data She d by subcontract a icant toxic metals inished parts. his declaration. The ditions of sale. The	6.300 st Directive) and best of Microconcentration of a test report and a test provided be assemblers and components.	thip of the chemical at the outer box inductor ated cannot by raw material d raw material These inited product led in	0.09	(mg) Total Doped Gold (mg) Total Nickel	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight 90.00	1.43

MICROCHIP Semiconductor Device Type	e: LT 06 (Lead)	SC-70 (R5)		nation Base A pper Alloy (C	•		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
-		"Contained In"	% Total			2.79	(mg) Total	Mold Compound	% ot Total Weight	t 42.97
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	2.75	,	•	ū	42.57
Silica, vitreous	60676-86-0	Mold Compound	36.525	2.374	365,245		Silica, vitreous	60676-86-0	85.00	_
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	2.632	0.171	26,319		Epoxy Resin	Trade Secret	6.13	4
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	2.632	0.171	26,319		Phenolic Resin	Trade Secret	6.13	4
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.053	0.068	10,528		Epoxy, Cresol Novolac	29690-82-2	2.45	4
Carbon Black	1333-86-4	Mold Compound	0.129	0.008	1,289		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	7.079	0.460	70,793			Total		
Iron	7439-89-6	Lead Frame	0.174	0.011	1,741	0.48	(mg) Total	Lead Frame	% of Total Weight	t 7.41
Silver	7440-22-4	Lead Frame	0.141	0.009	1,412		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.009	0.001	93		Iron	7439-89-6	2.35]
Phosphorous	7723-14-0	Lead Frame	0.006	0.000	61		Silver	7440-22-4	1.91	
Aluminum oxide	1344-28-1	Die Attach	0.424	0.028	4,236		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.770	0.050	7,702		Phosphorous	7723-14-0	0.08	
Amine (Trade Secret - 10039)	(Trade Secret - '	Die Attach	0.046	0.003	463			Total	100.00	<u></u>
Silicon	7440-21-3	Chip (Die)	1.860	0.121	18,600	0.08	(mg) Total	Die Attach	% of Total Weight	t 1.24
Gold	7440-57-5	Wire Bond	0.210	0.014	2.100		Aluminum oxide	1344-28-1	34	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	46,310	3.010	463,100		Epoxy resin	Trade Secret	62	1
	7440 01 0	TOTALS:	100.000	6.500	1.000.000		Amine		4	1
	0.0005			0.000	.,000,000		Amilie	Total	100.00	
		g Total Mass						iotai	100.00	,
This semiconductor device and its homogenous materials comply Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	/ with EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	HS Recast Dire	ctive) and with	EU	0.12	Total (mg)	Chip (Die)	% of Total Weight	t 1.86
Compliance with the above EU Directives has been verified via int	ternal design control	s, supplier declarations, and /or analytical test data.					D 107			
							Doped Silicon	7440-21-3	100	1
If a chemical substance is absent from the list above, the chemica Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regu	ent, there is no credil						Doped Silicon	7440-21-3 Total		
Incorporated's knowledge and belief as of the date of this docume	ent, there is no credil ulatory scheme world ability standard for pl	ble reason to believe that the unavoidable impurity conce I-wide.	ntration of the	chemical subs		0.01	(mg) Total			
Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regu Molding compounds used by Microchip meet the UL94 V0 flamma	ent, there is no credit ulatory scheme world ability standard for pla stics/	ble reason to believe that the unavoidable impurity conce I-wide. astics. You can access the UL iQTM family of databases	ntration of the	chemical subs	tance, if	0.01		Total	100.00	
Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regu Molding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/plas The protective "tubes" in which the specific product is shipped ar certain "reels" may be made from PVC plastic.	ent, there is no creditulatory scheme world ability standard for pl. stics/ re made from polyvir	ble reason to believe that the unavoidable impurity conce I-wide. astics. You can access the UL iQTM family of databases in myl chloride (PVC) plastic. "Window envelopes" used to h	ntration of the	chemical subs	tance, if	0.01	(mg) Total	Total Wire Bond	% of Total Weight	t 0.21
Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regu Molding compounds used by Microchip meet the UL94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/plas The protective "tubes" in which the specific product is shipped ar	ent, there is no creditulatory scheme world ability standard for platics/ re made from polyvinals form concerning sits knowledge and belien compiled based on some information and the average we	ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and the control of t	ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw mater	chemical subs report at g slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir	ter box and devices in antee the ers. Supplier of formation	0.01	(mg) Total	Total Wire Bond 7440-57-5	% of Total Weight	t 0.21
Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regulatory. In the second of the	ent, there is no creditulatory scheme world sbility standard for platics/ re made from polyving the form concerning standard been compiled based on some information and the average we nin silicon devices (sity, express or implied to the standard some information and the average we nin silicon devices (sity, express or implied	ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technolog that the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I lilicon IC) in the finished parts. d, with respect to the information provided in this declara	ntration of the to obtain a test old the packing ncorporated's gy incorporate vided by raw n and raw mater These estimate tion. The exclu	report at g slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir s do not includ sive, limited pr	ter box and devices in inter the ers. Supplier information le trace	3.01	(mg) Total	Total Wire Bond 7440-57-5	% of Total Weight	t 0.21
Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regulatory, is not below the threshold of regulatory concern for any regulatory concern for any regulatory. In the protective "tubes" in which the specific product is shipped an certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this their original packing materials is true and correct to the best of it completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets and is provided only as estimates of the average weight of these parts levels of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warrant warranties provided by Microchip Technology Incorporated and it	ent, there is no creditulatory scheme world ability standard for platics/ re made from polyving the form concerning sets knowledge and become compiled based on do some information and the average we man silicon devices (sity, express or implied to subsidiaries are contest to Material Contents.	ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I lilicon IC) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, districts.	ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw in and raw mater These estimate tion. The exclusale. These are irect or indirect or indirect	report at g slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pi e provided in N	ter box and devices in intee the ers. Supplier formation le trace roduct licrochip's		(mg) Total Doped Gold	Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100.00 % of Total Weight 100 100.00 % of Total Weight	t 0.21
ncorporated's knowledge and belief as of the date of this docume may, is not below the threshold of regulatory concern for any regulodiding compounds used by Microchip meet the UL.94 V0 flamma http://ul.com/global/eng/pages/offerings/industries/chemicals/plas The protective "tubes" in which the specific product is shipped are tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this heir original packing materials is true and correct to the best of it completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets an as provided only as estimates of the average weight of these parts weels of dopants, metals, and non-metal materials contained with Microchip Technology Incorporated does not provide any warrant varranties provided by Microchip Technology Incorporated and it juotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or change therwise, suffered by users or third parties as a result of the use	ent, there is no creditulatory scheme world ability standard for platics/ re made from polyving the form concerning sets knowledge and become compiled based on do some information and the average we man silicon devices (sity, express or implied to subsidiaries are contest to Material Contents.	ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases only chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I lilicon IC) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, districts.	ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw in and raw mater These estimate tion. The exclusale. These are irect or indirect or indirect	report at g slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pi e provided in N	ter box and devices in intee the ers. Supplier formation le trace roduct licrochip's		(mg) Total Doped Gold (mg) Total	Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight 100 100.00	t 0.21

LT 6 SC-70 11:13 AM : 8/29/2013

AICROCHIP Semiconductor Device Typ	e: SS 20 (Lead)	SSOP 209" (63/6E)		ination Base opper Alloy (. ,			geneous Materials: . pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Connecticution Device 13p	C. CC ZO (Leau)	"Contained In"	% Total	I	, 					
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	131.03	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	113.880	693,542		Silica, vitreous	60676-86-0	86.91	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	6.121	10.050	61,207		Epoxy Resin	Trade Secret	7.67	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.078	6.696	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.406	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.031	16,472	100.314			Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.405	2.468	17.24	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.328	2,000	17.24	Copper	7440-50-8	95.54	10.5
Zinc		Lead Frame	0.200	0.326	131			7440-50-8	2.35	
	7440-66-6						Iron			
Phosphorous	7723-14-0	Lead Frame	0.009	0.014	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.924	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.172	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.092	563			Total	100.00	
Modified Amine	827-43-0	Die Attach	0.026	0.043	263	1.23	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	12.315	75,000		Silver (Ag)	7440-22-4	75.00	
Doped Gold	7440-57-5	Wire Bond	0.200	0.328	2.000		Modified Epoxy Resin	13561-08-5	14.00	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	2.053	12,500		iglycidylether of bisphenol-F	54208-63-8	7.50	
		TOTALS:	100.000	164.200	1.000.000		Modified Amine		3.50	
								827-43-0		
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 20	g Total Mass 002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH			,,	12.32	(mg) Total	827-43-0 Total Chip (Die)	100.00 % of Total Weight	7.5
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via intended the characteristic of the ch	with EU Directive 20 ernal design controls substance is NOT a	g Total Mass 102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and,	S Recast Dire	ective) and wi	th EU	12.32		Total	100.00	7.5
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via intended in the second of the chemical substance is absent from the list above, the chemical prorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flammat (//ul.com/global/eng/pages/offerings/industries/chemicals/plas)	with EU Directive 20 rnal design controls substance is NOT a nt, there is no credit atory scheme world illity standard for pla ics/	g Total Mass 10/2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. 10 in intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. 10 institute of the semiconductor device and other semiconductor device and other semiconductors. 11 institute of the semiconductor device and other semiconductors are semiconductors. 12 institute of the semiconductor device and other semiconductors. 13 institute of the semiconductor device and other semiconductors. 14 institute of the semiconductor device and other semiconductors. 15 institute of the semiconductor device and other semiconductors. 16 institute of the semiconductor device and other semiconductors. 17 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 20 institute of the semiconductors. 20 institute	S Recast Director to the best of the tradion of the boots	ective) and wi of Microchip T e chemical sul st report at	th EU	0.33	(mg) Total	Total Chip (Die) 7440-21-3	100.00 % of Total Weight	7.5
s semiconductor device and its homogenous materials comply citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via intechemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regul ding compounds used by Microchip meet the UL94 V0 flammat://ul.com/global/eng/pages/offerings/industries/chemicals/plast/protective "tubes" in which the specific product is shipped arcertain "reels" may be made from PVC plastic.	with EU Directive 20 rnal design controls substance is NOT a nt, there is no credit atory scheme world illity standard for pla ics/	g Total Mass 10/2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. 10 in intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. 10 institute of the semiconductor device and other semiconductor device and other semiconductors. 11 institute of the semiconductor device and other semiconductors are semiconductors. 12 institute of the semiconductor device and other semiconductors. 13 institute of the semiconductor device and other semiconductors. 14 institute of the semiconductor device and other semiconductors. 15 institute of the semiconductor device and other semiconductors. 16 institute of the semiconductor device and other semiconductors. 17 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 18 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 19 institute of the semiconductor device and other semiconductors. 20 institute of the semiconductors. 20 institute	S Recast Director to the best of the tradion of the boots	ective) and wi of Microchip T e chemical sul st report at	th EU		(mg) Total Doped Silicon	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). apliance with the above EU Directives has been verified via interpretary in the list above, the chemical reported's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat liful.com/global/eng/pages/offerings/industries/chemicals/plass/protective "tubes" in which the specific product is shipped and certain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information in this original packing materials is true and correct to the best of its pleteness and accuracy of data in this form because it has beel piler information is often protected from disclosure as trade se mation is provided only as estimates of the average weight of	with EU Directive 20 rnal design controls substance is NOT a nt, there is no credit atory scheme world illity standard for pla ics/ made from polyvin s form concerning s knowledge and bel an compiled based o crets and some info these parts and the	g Total Mass 10/2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. 10 in intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concentwide. 10 institute of the data seems of the data s	s Recast Director to the best of tration of the poblatin a test of the packin corporated's y Incorporate trided by raw intided by raw intides and it	of Microchip T e chemical sul at report at g slip on the d semiconducted cannot gua material supp raw material supp	echnology bstance, if outer box or devices in trantee the liers.		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
npliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical proprated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regul ding compounds used by Microchip meet the UL94 V0 flammat ://ul.com/global/eng/pages/offerings/industries/chemicals/plasi-protective "tubes" in which the specific product is shipped are	with EU Directive 20 renal design controls substance is NOT a nt, there is no credit atory scheme world illity standard for pla ics/ e made from polyvin s form concerning s is knowledge and bel en compiled based o crets and some info these parts and the ontained within silico en, express or implied	g Total Mass 10/2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concentwide. Instics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to how the strict of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets prower as of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets prower as the subscentract assess average weight of anticipated significant toxic metals control devices (silicon IC) in the finished parts.	to the best of the total total the packing obtain a test of the packing of the pa	of Microchip T e chemical sul at report at g slip on the of semiconduct ed cannot gua material supp raw material s lesse estimates	echnology bstance, if couter box or devices in trantee the liers. It is do not couter both the product		(mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via interporated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat //ul.com/global/eng/pages/offerings/industries/chemicals/plasiprotective "tubes" in which the specific product is shipped ancertain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information in this original packing materials is true and correct to the best of its pleteness and accuracy of data in this form because it has beolier information is often protected from disclosure as trade se mation is provided only as estimates of the average weight of det trace levels of dopants, metals, and non-metal materials conchip Technology Incorporated does not provide any warranty anties provided by Microchip Technology Incorporated and its	with EU Directive 20 renal design controls substance is NOT a tt, there is no credit atory scheme world illity standard for pla ics/ e made from polyvin s form concerning s te knowledge and bel en compilled based o crets and some info these parts and the matained within silico t, express or implied subsidiaries are co s to Material Conten	g Total Mass 10/2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs), specified and for analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concentwide. In intentional in gredient in the IQTM family of databases to all the intentional in the properties of the databases to the intentional intention in the family of the intention in the intention in the intention provided in this declaration in the intention in the intention provided in this declaration in the indirections of set the properties and conditions of set the properties in the intention in the intention in the intention of set the conditions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages, directions and shall not be liable for any damages.	s Recast Director to the best of the to obtain a test of obtain a test of the packin corporated's yincorporated by raw is emblers and inponents. The exclusion. The exclusion. The exclusion. The exclusion. The exclusion.	of Microchip T chemical sul streport at g slip on the chemical sup material sup praw material sup sees estimates usive, limited re provided in ct, consequen	echnology betance, if butter box or devices in trantee the liers. suppliers. s do not product Microchip's tial or	0.33	(mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.2

SS 20 SSOP

100.000

11:13 AM: 8/29/2013

164.200

Semiconductor Device Type	a. SS 24 (Load) SS(DP 200" (12 / III)		ation Base A	- ,		•	ogeneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Device Type	7. 33 24 (Lead) 33C	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	121.55	(mg) Total	Mold Compound	% ot Total Weight	65.17
Silica, vitreous	60676-86-0	Mold Compound	55.395	103.316	553.945		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.992	7,445	39.917		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.992	7,445	39.917		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.597	2.978	15,967		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.196	0.365	1,955		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	28.222	52.636	282,218			Total	100.00	
Iron	7439-89-6	Lead Frame	0.694	1,295	6,942	55.10	(mg) Total	Lead Frame	% of Total Weight	29.54
Silver	7440-22-4	Lead Frame	0.563	1.050	5.627		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.037	0.069	369		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.024	0.045	244		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.622	1.159	6,216		Zinc	7440-66-6	0.13	
Epoxy resin	Trade Secret	Die Attach	0.168	0.313	1,680		Phosphorous	7723-14-0	0.08	
Metal oxide		Die Attach	0.025	0.047	,		Filospilolous		100.00	
	Trade Secret				252			Total		
Gamma-butyrolactone	96-48-0	Die Attach	0.025	0.047	252	1.57	(mg) Total	Die Attach	% of Total Weight	0.84
Silicon	7440-21-3	Chip (Die)	2.490	4.644	24,900		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.250	0.466	2,500		Epoxy resin	Trade Secret	20	
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.710	3.189	17,100		Metal oxide	Trade Secret	3	
		TOTALS:	100.000	186.510	1,000,000		Gamma-butyrolactone	96-48-0 Total	3 100.00	
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intelemical substance is absent from the list above, the chemical	I substance is NOT an inte	ntional ingredient in the semiconductor device and				4.64	Total (mg) Doped Silicon	7440-21-3 Total	% of Total Weight 100 100.00	2.49
oorated's knowledge and belief as of the date of this docume s not below the threshold of regulatory concern for any regu ng compounds used by Microchip meet the UL94 V0 flammal ul.com/global/eng/pages/offerings/industries/chemicals/plas	latory scheme world-wide. bility standard for plastics.	. ,			tance, ir					
	e made from polyvinyl chl					0.47	(mg) Total	Wire Bond	% of Total Weight	0.25
rotective "tubes" in which the specific product is shipped ar n "reels" may be made from PVC plastic.	e made nom poryvinyi cin	oride (PVC) plastic. "Window envelopes" used to ho	old the packing	slip on the ou	ter box and	0.47	(mg) Total Doped Gold	Wire Bond 7440-57-5	100	0.25
	s form concerning substat s knowledge and belief, as en compiled based on the d some information may n and the average weight of	nces restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technologranges provided in Material Safety Data Sheets provid have been provided by subcontract assemblers a anticipated significant toxic metals components. T	ncorporated's s gy Incorporated vided by raw m and raw materi	emiconductor I cannot guara aterial supplical al suppliers. Ii	devices in antee the ers. Supplier of the formation	0.47	,	7440-57-5 Total		0.25
n "reels" may be made from PVC plastic. chip Technology Incorporated believes the information in this original packing materials is true and correct to the best of it leteness and accuracy of data in this form because it has be- nation is often protected from disclosure as trade secrets an vided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained withi chip Technology Incorporated does not provide any warrant; nties provided by Microchip Technology Incorporated and its tions, sales order acknowledgement, and invoices.	s form concerning substates knowledge and belief, as en compiled based on the d some information may n and the average weight of in silicon devices (silicon I y, express or implied, with s subsidiaries are contained	nces restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technologranges provided in Material Safety Data Sheets provid have been provided by subcontract assemblers a anticipated significant toxic metals components. TC) in the finished parts. respect to the information provided in this declarated in Microchip's standard terms and conditions of standard terms.	ncorporated's s gy Incorporated vided by raw m and raw materi these estimated tion. The exclusion. These are	emiconductor d cannot guara laterial supplie al suppliers. It do not includ sive, limited pr provided in M	r devices in antee the ers. Supplier aformation le trace	3.19	,	7440-57-5	100	0.25
n "reels" may be made from PVC plastic. chip Technology Incorporated believes the information in thi original packing materials is true and correct to the best of it leteness and accuracy of data in this form because it has be nation is often protected from disclosure as trade secrets an vided only as estimates of the average weight of these parts of dopants, metals, and non-metal materials contained withi chip Technology Incorporated does not provide any warrant nties provided by Microchip Technology Incorporated and its	is form concerning substat s knowledge and belief, as en compiled based on the d some information may n and the average weight of in silicon devices (silicon I y, express or implied, with s subsidiaries are containe	nces restricted by RoHS in Microchip Technology In of the date listed in this form. Microchip Technolog ranges provided in Material Safety Data Sheets provid have been provided by subcontract assemblers a anticipated significant toxic metals components. TC) in the finished parts. respect to the information provided in this declarated in Microchip's standard terms and conditions of sarations and shall not be liable for any damages, directions of sarations and shall not be liable for any damages, directions of sarations and shall not be liable for any damages, directions are sarations.	ncorporated's s gy Incorporated vided by raw mand raw materi hese estimates tion. The exclusion. The exclusion are	emiconductor d cannot guara laterial supplie al suppliers. Il s do not includ sive, limited pr provided in M	r devices in antee the ers. Supplier of the formation le trace roduct dicrochip's		Doped Gold	7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100	

SS 24 SSOP 11:13 AM : 8/29/2013

icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in leif original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's ucotations, sales order acknowledgement, and invoices. 2.87 (mg) Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for / annealed	MICROCHIP				ation Base A				nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Basic Substance	Semiconductor Device Typ	e: SS and SI 28	3 (Lead) SSOP .209" (N2 / ND)								е3
Siltox virtuosis			"Contained In"		mg/part	ppm	182.90	(mg) Total	Mold Compound	% ot Total Weight	79.8
Phenophore Phe	Silica, vitreous	60676-86-0	Mold Compound	67.830				Silica, vitreous	60676-86-0	85.00	
Expost Create Nervices 2890-852 Most Compound 1,955 4,481 19,551 Carbon Black 1330-864 Most Compound 1,740 1,744 Carbon Black 1330-864 Most Compound 1,744 1,7	Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	4.888		48,878		Epoxy Resin	Trade Secret	6.13	
Carbon Black											
Copper											
Silver (A) 7440-224 Leaf Frame (C) 247 (C) 0.568 (C) 2.698 (C) 2.6								Carbon Black			
Siver 7440-22-4 Lead Farne 0.350 0.458 2,000 13 1600											
Tack Phosphorous Propositions P	-					,	24.07				10.5
Propertions											
Silver (Ag) 744-02-4 Dia Attach 0.563 1.288 5.055 Modified Egoty Resin 13561-08-5 Dia Attach 0.105 Dia Attach 0.105											
Modified Epoxy Resin 13961-08-5 Dia Attach 0.105 0.241 1,050 Diplycity/eighrefor 15 4509-08-3 Dia Attach 0.056 0.060 263 1,22 581 Sicon 7440-71-3 Chip (Dia) 7440-71-3 Chip (Dia) 7,800 7,110 7,500 In 7440-71-3 Plant on external less plant in the semiconductor device and its homogenous materials comply with EU Directive). 0.2292 g Total Mass Directive 2002/85EC (End-of-Life Vehicles (ELV) Directive). Directive 2002/85EC (End-of-Life Vehicl											
Diglycocycleter of bisphenoc/F \$4208-83-8 De Attach 0.056 0.129 563 Modified Anne 827-43-0 De Attach 0.026 0.060 263 172 (mg) Total De Attach 0.75 Silicon 7440-21-3 Total Total											
Modified Annie 87-43-0 Die Attach 0.00% 0.							ļ l	Filospilorous			
Silicon 7440:21-3 Chi (Die) 7.500 (T190 T5,000 (T190 T5,0							4.70	() T-4-1			0.75
Miss semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (End-of-Life Vehicles (ELV) Directive 2002/95/EC (RoHS Directive), EU Directive 2011/85/EU (RoHS Recast Directive) and with EU compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. 17.9 Depoil Silicon 17.40 (mg) Chip (Die) % of Total Weight 7.5 (mg) Total (mg)							1.72				0.75
Tin 744031-5 Putting on external leads girpsi) - Maters Tin / arresized at 150°C for 1000 , 000 229.20 1, 1000,000 229.20 1,											
D.229 g Total Mass O.290							Dia				
D.2.922 q Total Mass O.2.922 q Total Mass In samiconductor device and its homogenous materials comply with EU Directive 2012/5/EC (End-of-Life Vehicles (ELV) Directive). In somiliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In somiliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In somiliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In somiliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In somiliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. In somiliance with the above EU Directives, the chiercal substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology corporated's knowledge and bellef as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and train "reels" may be made from PVC plastic. Icrochip Technology Incorporated believes the information in this form concerning substances restricted by ReHS in Microchip Technology Incorporated cannot guarantee the provided on the ranges provided in Material's suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers.	1111	7440-31-3					Dig				
his semiconductor device and its homogenous materials comply with EU Directive 2002/39/EC (End-of-Life Vehicles (ELV) Directive). 17.9 Total (mg) Chip (Die) % of Total Weight 7.5 months of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if you not will be the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if you not be the threshold of regulatory concern for any regulatory scheme world-wide. 2.50 doi: 2.50 doi: 2.50 doi: 3.50 doi:		0.2202		100.000	223.200	1,000,000		Wodined Amine			
corporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if yo, is not below the threshold of regulatory concern for any regulatory scheme world-wide. olding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at ttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ the protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and artain "reels" may be made from PVC plastic. Total Doped Gold T	compliance with the above EU Directives has been verified via in	•		, to the best of	Microchip Tec	chnology		,	7440-21-3	100	
icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in leif original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided by RoHS in Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided by Subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. 2.87 (mg) Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for / Incording	ny, is not below the threshold of regulatory concern for any reg Molding compounds used by Microchip meet the UL94 V0 flamm	ulatory scheme world ability standard for pl	l-wide.			tance, if	0.46	(mg) Total	Wire Bond	% of Total Weight	0.2
icrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in eier original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the ompleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided suppliers. Supplier formation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace vels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Icrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uotations, sales order acknowledgement, and invoices. Icrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	he protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic.	re made from polyvir	nyl chloride (PVC) plastic. "Window envelopes" used to he	old the packing	slip on the ou	ter box and		Doped Gold	7440-57-5	100	
arranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 2.87 (mg) Total leads (pins) - Matte Tin / Annealed at 150°C for leads (pins) - Matte Tin / Annealed a							'		Total	100.00	•
therwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or third party test re	neir original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets a provided only as estimates of the average weight of these part	its knowledge and be seen compiled based of and some information as and the average we	lief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers ight of anticipated significant toxic metals components. 1	gy Incorporated vided by raw m and raw materi	d cannot guara aterial supplic al suppliers. Ir	entee the ers. Supplier oformation					
Total 100.00	heir original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has b information is often protected from disclosure as trade secrets a provided only as estimates of the average weight of these para evels of dopants, metals, and non-metal materials contained wit flicrochip Technology Incorporated does not provide any warrar	its knowledge and be leen compiled based of and some information its and the average we thin silicon devices (si	lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. I lilicon IC) in the finished parts. d, with respect to the information provided in this declarated.	gy Incorporated vided by raw mand raw materi hese estimated tion. The exclusion.	d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pr	antee the ers. Supplier oformation le trace	2.87	(mg) Total	leads (pins) - Matte Tin	% of Total Weight	1.25
	heir original packing materials is true and correct to the best of ompleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these parevels of dopants, metals, and non-metal materials contained wit dicrochip Technology Incorporated does not provide any warrar varranties provided by Microchip Technology Incorporated and uotations, sales order acknowledgement, and invoices.	its knowledge and be een compiled based of und some information is and the average we hin silicon devices (si htty, express or implied its subsidiaries are co ges to Material Conter	lief, as of the date listed in this form. Microchip Technologon the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers sight of anticipated significant toxic metals components. I dilcon IC) in the finished parts. d, with respect to the information provided in this declarationtained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, di	gy Incorporated vided by raw mand raw materi hese estimated tion. The exclusional rate are treet or indirect	d cannot guara laterial supplies al suppliers. Ir s do not includ sive, limited pr provided in M , consequentia	antee the ers. Supplier oformation le trace roduct licrochip's	2.87	(mg) rotal	leads (pins) - Matte Tin / annealed at 150°C for		1.25

SS SI 28 SSOP 11:13 AM : 8/29/2013

Basic Substance CAS Number Sub-Component Wight mg/part Siles, vireous for fused 65676-86-0 Mold Compound 6478-80 Floory Resen Trade Secret Mold Compound 648-3 Floory Resen Trade Secret Floory Resen	MICROCHIP Semiconductor Device	e Type: WHE 32 TSC	DP 8x44mm (M6)		ination Base opper Alloy (ogeneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Silica, vitrous for fuser) Epopy Resin Trade Secret Mold Compound 67,830 169,372 678,300 February 100,000 14,745 100,000 14		,	"Contained In"				199.26	(mg) Total	Mold Compound	% ot Total Weight	79.8
Epoy Resin Trade Secret Mold Compound 6,943 17,336 69,426 Phenois Resin Trade Secret 8,70 Phenois Resin 17,400 Secret Mold Compound 1,020 10,000 12,304 12,3				•				Cilian vitanaus (autores)	00070 00 0	05.00	
Principle Resin											
Cathon Black											
Copper											
Nickel 7440-22-0 Lead Frame 0, 267 0, 266 2, 267 2622 (mg) Total Lead Frame 9, 267 Total Weight 105 Silver 7440-21-3 Lead Frame 0, 011 0, 026 105 Nickel 7440-20-0 2, 254 Nickel 7440-22-1 Lead Frame 0, 011 0, 026 105 Nickel 1740-20-0 2, 254 Nickel	*****							Calbon Black			
Silicon 7440:21:3 Lead Frame 0.047 0.118 473 Nagas-passes with the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain reads" in provided only as estimates of the average weight of these parts and the survey of data in this form because it has been complied based on the ranges provided in Waters and on rest and accoract to the best of the provided only as estimates of the average weight of these parts and the average weight							26.22	(mg) Total			10.5
Magnesium 17439-954 Lead Frame 0.011 0.026 105 Silver 7440-224 Lead Frame 0.175 0.438 1,752 Silver 7440-224 Die Atlach 0.600 1.498 6.000 Expoy Resin Trade Secret Die Atlach 0.128 0.318 1,275 Copper 7440-50-8 Die Atlach 0.023 0.066 2.25 Silver 7440-27-13 0.45 Magnesium 7439-954 0.10 Magnesium 7440-975 0.10 Magnesium 7							26.22				10.5
Silver 7440-22-4 Lead Frame 0.175 0.438 1.752 Silver 7440-22-4 Die Attach 0.6500 1.488 6.000 Epoxy Resin Trade Secret Die Attach 0.023 0.056 225 Silcon 7440-59-8 Die Attach 0.023 0.056 225 Silcon 7440-59-5 Die Attach 0.023 0.056 225 Silcon 7440-59-5 Die Attach 0.020 0.499 2.000 Silcon 7440-59-5 Die Attach 0.020 0.499 2.000 Silcon 7440-59-5 Die Attach 0.020 0.0499 2.000 0.020 0.0499 2.000 0.020											
Silver 7440:22-4 Die Attach 0.600 1.498 6.000 Epoxy Resin Trade Secret Die Attach 0.128 0.318 1.275 Copper 7440:50-8 Die Attach 0.023 0.056 225 Silicon 7440:21-3 Chip (Die) 7.500 1.872 75,000 1.87 (mg) Total 100.00 Tin 7440:57-5 Wire Bond 0.200 0.499 2.000 Tin 7440:51-5 Plasting on esternal leads (great-Mater Tan/amenel et 150°C by 1 mo. 1 1.250 0.312 1.12,000 O.2497 g Total Mass **TOTALS: 100.000 249.700 1,000,000 O.2497 g Total Mass **Total 100.00 O.2497 g Total Mass **Semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU the microlal substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology provated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not bollow the threshold of regulatory concentr of any regulatory concentre of any regulato											
Epoxy Resin Trade Secret Die Attach 0.128 0.318 1.275 Copper 17440-50.8 Die Attach 0.023 0.056 225 Sillcon 7440-57.5 Chip (Die) 7.500 18.728 75.000 18.72 75.000 19.000,000 18.72 75.000 19.000,0											
Copper 17440-50-8 Die Attach 0.023 0.056 225 Billicon 7440-21-3 Chip (Die) 7.500 18.728 75.000 18.72 75.000 18.728 75.000 18.72											
Silicon 7440-21-3 Chip (Die) 7.500 18.728 7.5000 1.877 (mg) Total Die Attach N. of Total Weight 0.75 Planting on external leads (pire) - Matter Tin architect 1.250 3.121 12.500 Epoxy Resin Trade Secret 7.400-21-3 Total Total								Silver			
Doped Gold 7440-57-5 Wire Bond 1.200 0.489 2.000 1.400 0.000 0.489 2.000 1.400 0.489 2.000 0.489 2.000 1.400 0.489 2.000 1.400 0.489 2.000 1.400 0.489 2.000								-			
Tin 7440-31-5 Pating on external baschs (preq) - Metata Tin / amrealed at 150°C for 1 tow 249.700 1,000,000 249.700 1,000,000 1,000,000 1,000,000 1,000,000							1.87				0.75
O.2497 g Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rnd-Orl-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. the mical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of fill for this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. Ingo compounds used by Microchip meet the ULS4 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at //ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box cochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data, and non-metal materials contained within slicen devices (silicent C) in the finished parts. Total 100.00 Total Wire Bond % of Total Weight 0.50 (mg) Total Wire Bond % of Total Weight 0.50 (mg) Total 100.00 Doped Gold 7440-57-5 100.00 Total 100.00 Poped Gold 7440-57-5 100.00 Poped Gold 7440-57-5 100.00 Total 100.00 Poped Gold 7440-57-5 100.00 Poped Gold 7440-5											
O.2497 g Total Mass semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 18.73 (mg) Total Chip (Die) % of Total Weight 7.5 pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. Silicon 7440-21-3 100.00 Total	Tin	7440-31-5 F									
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. chemical substance is absent from the list above, the chemical substance is NOT an internal design controls, supplier declarations, and /or analytical test data. shemical substance is absent from the list above, the chemical substance is NOT an internal design controls in oredible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. ling compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at //vulc.om/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain "reels" may be made from PVC plastic. cochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form because it has been complied based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. solier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. solier information is often protected from disclosure as trade secrets and some information may not have been provided in Material Safety Data Sheets provided by raw material			TOTALS:	100.000	249.700	1,000,000		Copper	7440-50-8		
semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU 18.73 (mg) Total Chip (Die) % of Total Weight 7.5 100.00 18.73 (mg) Total 100.00 18.74 (2-1-3) (mg) Total 100.00 100.00 18.73 (mg) Total 100.00 18.73 (mg) Total 100.00 18.73 (mg) Total 100.00 18.74 (2-1-3) (mg) Total 100.00		0.2497 a	Total Mass						Total	100.00	•
ling compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at //ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box certain "reels" may be made from PVC plastic. Ochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Inmation is orden protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Inmation is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not did trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product				S Recast Dire	ective) and wi	th EU	18.73	(mg) Total	Chip (Die)	% of Total Weight	7.5
certain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. In the provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not ide trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Ochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this do	omply with EU Directive 2002 via internal design controls, s nemical substance is NOT an ocument, there is no credible	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen	to the best o	of Microchip To	echnology	18.73	1 0	7440-21-3	100	7.5
ochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. blier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. mation is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not added trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Plating on external lead of the contained within Silicon Material Safety Material Safe	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the ch corporated's knowledge and belief as of the date of this do y, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 VO flice.	via internal design controls, s nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w ammability standard for plast	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concenide.	to the best o	of Microchip To chemical sub	echnology		Silicon	7440-21-3 Total	100	7.5
ochip recliniology incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this delay, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 VO flap://ul.com/global/eng/pages/offerings/industries/chemical	via internal design controls, sometive 2002 via internal design controls, sometical substance is NOT an ocument, there is no credible y regulatory scheme world-wammability standard for plast is/plastics/	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concentide.	to the best of the obtain a tes	of Microchip To e chemical sub et report at	echnology ostance, if		Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
anties provided by Microchip Technology incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's 3.12 (mg) Total Weight 1.25	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the cheorporated's knowledge and belief as of the date of this doy, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemical the protective "tubes" in which the specific product is shipped certain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information eir original packing materials is true and correct to the been supplier information is often protected from disclosure as troormation is provided only as estimates of the average we	via internal design controls, sometical substance is NOT an occument, there is no credible yregulatory scheme world-wammability standard for plast is/plastics/ ped are made from polyvinyl in in this form concerning subst of its knowledge and belief has been compiled based on irade secrets and some inform ight of these parts and the average secrets and some inform ight of these parts and the average secrets and some inform ight of these parts and the average secrets are secret secrets.	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concentide. itics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to host access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to host access restricted by RoHS in Microchip Technology Interanges provided in Material Safety Data Sheets provided in Material Safety Data Sheets provided by subcontract asseverage weight of anticipated significant toxic metals con	to the best of the contraction of the coordinates of the packin corporated's placeroperate of the corporate	of Microchip To e chemical substitute of the control of semiconducted cannot gua material supp raw material supp	echnology ostance, if outer box or devices in rantee the liers.		Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or rwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) Tin 7440-31-5 100.00	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the charporated's knowledge and belief as of the date of this dey, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemical per protective "tubes" in which the specific product is ship in the certain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information eir original packing materials is true and correct to the beimpleteness and accuracy of data in this form because it implier information is often protected from disclosure as to formation is provided only as estimates of the average we clude trace levels of dopants, metals, and non-metal mate crochip Technology Incorporated does not provide any we	via internal design controls, sometical substance is NOT an occument, there is no credible yregulatory scheme world-wammability standard for plast is/plastics/ ped are made from polyvinyl in in this form concerning subst of its knowledge and belief has been compiled based on a rade secrets and some infornight of these parts and the avrials contained within silicon arranty, express or implied, v	295/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concentide. itics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to host stances restricted by RoHS in Microchip Technology Int., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provation may not have been provided by subcontract asseverage weight of anticipated significant toxic metals condevices (silicon IC) in the finished parts.	to the best of the contraction o	of Microchip To e chemical substituted at g slip on the of semiconducted cannot gua material supp raw material supp raw material supp seese estimates	echnology ostance, if outer box or devices in transee the liers. uppliers. I do not product	0.50	Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	
this Certificate of Compliance for semiconductor products.	rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified in chemical substance is absent from the list above, the chorporated's knowledge and belief as of the date of this down, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flip://lul.com/global/eng/pages/offerings/industries/chemical e protective "tubes" in which the specific product is shipled certain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information is orden protected from disclosure as the pipiler information is often protected from disclosure as the protective and accuracy of data in this form because it is pipiler information is often protected from disclosure as the committed in the protected from disclosure as the committed in the protected from the consumer of the average we clude trace levels of dopants, metals, and non-metal mate crochip Technology Incorporated does not provide any with the protected from the consumer of the provided only microchip Technology Incorporated does not provide any with the provided by Microchip Technology Incorporated does not provide any with the provided provided only microchip Technology Incorporated does not provide any with the provided	via internal design controls, sometical substance is NOT an ocument, there is no credible yregulatory scheme world-wammability standard for plast is/plastics/ ped are made from polyvinyl in in this form concerning subst of its knowledge and belief has been compiled based on the rade secrets and some informight of these parts and the avrials contained within silicon arranty, express or implied, wand its subsidiaries are controlled to the secret of	295/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concentide. citics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to how it is a set to the date listed in this form. Microchip Technology In fig. as of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets provination may not have been provided by subcontract asseverage weight of anticipated significant toxic metals condevices (silicon IC) in the finished parts. With respect to the information provided in this declaratial ained in Microchip's standard terms and conditions of subcolerations and shall not be liable for any damages, directions.	to the best of the book of the packin a test of the packin corporated's by Incorporate vided by raw emblers and inponents. The ion. The exclusion. The exclusion of the packing are to rindirect or indirect or in	of Microchip To e chemical sub- et report at g slip on the of semiconducted cannot gua material supp raw material s leese estimates usive, limited re provided in	echnology ostance, if outer box or devices in rantee the liers. uppliers. s do not product Microchip's tial or	0.50	Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.2

WHE 32 TSOP 11:13 AM: 8/29/2013

AICROCHIP				ination Base opper Alloy (•			ogeneous Materials: .g. pc boards, display	rs)	JEDEC 97 Produc Marking and/or Pkg. Labeling e3
Semiconductor Device	Type: EIE 40 TSC									
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	309.52	(mg) Total	Mold Compound	% ot Total Weight	67.2
Silica, vitreous (or fused)	60676-86-0	Mold Compound	57.120	263.095	571,200		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	5.846	26.929	58,464		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.032	18.571	40,320		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.202	0.929	2,016		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	26.248	120.900	262,484		-	Total	100.00	_
Nickel	7440-02-0	Lead Frame	0.700	3.224	7,000	126.94	(mg) Total	Lead Frame	% of Total Weight	27.56
Silicon	7440-21-3	Lead Frame	0.124	0.571	1.240		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.028	0.127	276		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.460	2.119	4,600		Silicon	7440-21-3	0.45	
Silver	7440-22-4	Die Attach	0.360	1.658	3,600		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade Secret	Die Attach	0.077	0.352	765		Silver	7440-22-4	1.67	
Copper	7440-50-8	Die Attach	0.014	0.062	135			Total	100.00	<u> </u>
Silicon	7440-21-3	Chip (Die)	1.900	8.751	19.000	2.07	(mg) Total	Die Attach	% of Total Weight	0.45
Doped Gold	7440-57-5	Wire Bond	0.280	1.290	2.800		Silver	7440-22-4	80.00	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.610	12.022	26,100		Epoxy Resin	Trade Secret	17.00	
		TOTALS:	100.000	460.600	1.000.000		Copper	7440-50-8	3.00	
	0.4606	g Total Mass			1,111,111			Total		<u> </u>
	omply with EU Directive 200	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and wit	h EU	8.75	(mg) Total	Chip (Die)	% of Total Weight	1.9
s semiconductor device and its homogenous materials ce ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che	ria internal design controls,	supplier declarations, and /or analytical test data.		,		8.75	(mg) Total Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do r, is not below the threshold of regulatory concern for any	ria internal design controls, emical substance is NOT a cument, there is no credibl r regulatory scheme world-	supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concen wide.	to the best o	of Microchip Te chemical sub	echnology	8.75		7440-21-3	100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do	ria internal design controls, emical substance is NOT a cument, there is no credibl regulatory scheme world- mmability standard for pla	supplier declarations, and /or analytical test data. n intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concen wide.	to the best o	of Microchip Te chemical sub	echnology	1.29		7440-21-3	100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive), mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do to, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 fla	ria internal design controls, emical substance is NOT a cument, there is no credibl regulatory scheme world- mmability standard for pla- s/plastics/	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concen- wide. Stics. You can access the UL iQTM family of databases to	to the best of tration of the o obtain a tes	of Microchip To chemical sub t report at	echnology sstance, if		Silicon	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.28
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do to, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 fla p://ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp	ria internal design controls, emical substance is NOT at cument, there is no credibly regulatory scheme world-immability standard for plans/plastics/ ped are made from polyviny in this form concerning sut of its knowledge and beliase been compiled based or parts and some information in parts and the average weig	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concent wide. It is is the concentration of the concentr	to the best of tration of the poblain a tes did the packin corporated's y Incorporate dided by raw and raw mate	of Microchip To e chemical sub- treport at g slip on the c semiconducted d cannot gua material supplirial supplirial suppliers.	echnology stance, if outer box and or devices in rantee the liers. Supplier Information		Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.28
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified v chemical substance is absent from the list above, the che orporated's knowledge and belief as of the date of this do to, is not below the threshold of regulatory concern for any lding compounds used by Microchip meet the UL94 V0 fla p://ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp tain "reels" may be made from PVC plastic. prochip Technology Incorporated believes the information ir original packing materials is true and correct to the bes mpleteness and accuracy of data in this form because it he ormation is often protected from disclosure as trade secre provided only as estimates of the average weight of these	via internal design controls, emical substance is NOT at cument, there is no credibly regulatory scheme world-immability standard for platicipal platicipal properties of the form concerning suit of its knowledge and belias been compiled based or ests and some information in parts and the average weig within silicon devices (silicuranty, express or implied, erranty, express or implied,	supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, or reason to believe that the unavoidable impurity concentivide. It is is a consistent of the concentiation of the concentiati	to the best of tration of the coordinates obtain a test of the packin corporated's y Incorporate dided by raw mate nese estimate on. The excli	of Microchip To e chemical sub- treport at g slip on the c semiconducte d cannot gua material suppliers. es do not inclu- usive, limited i	echnology stance, if outer box and or devices in rantee the liers. Supplier Information ide trace		Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.28

EIE 40 TSOP 11:14 AM: 8/29/2013

Semiconductor Device Type: EKE 48 TSOP 12x20mm (W9)		opper Alloy (Cu)		8.1 Electronics (e	ogeneous Materials: .g. pc boards, display	s)	and/or Pkg. Labeling e3
"Contained In"	% Total			377.31	(mg) Total	Mold Compound	% ot Total Weight	66.84
Basic Substance CAS Number Sub-Component	Weight	mg/part	ppm	377.31	,			00.04
Silica, vitreous (or fused) 60676-86-0 Mold Compound	56.814	320.715	568,140		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin Trade Secret Mold Compound	5.815	32.826	58,151		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin Trade Secret Mold Compound	4.010	22.639	40,104		Phenolic Resin	Trade Secret	6.00	
Carbon Black 1333-86-4 Mold Compound	0.201	1.132	2,005		Carbon Black	1333-86-4	0.30	
Copper 7440-50-8 Lead Frame	26.982	152.312	269,818			Total	100.00	
Nickel 7440-02-0 Lead Frame	0.720	4.062	7,196	159.92	(mg) Total	Lead Frame	% of Total Weight	28.33
Silicon 7440-21-3 Lead Frame	0.127	0.720	1,275		Copper	7440-50-8	95.24	
Magnesium 7439-95-4 Lead Frame	0.028	0.160	283		Nickel	7440-02-0	2.54	
Silver 7440-22-4 Lead Frame	0.473	2.669	4.728		Silicon	7440-21-3	0.45	
Silver 7440-22-4 Die Attach	0.304	1.716	3,040		Magnesium	7439-95-4	0.10	
Epoxy Resin Trade Secret Die Attach	0.065	0.365	646		Silver	7440-22-4	1.67	
Copper 7440-50-8 Die Attach	0.011	0.064	114			Total	100.00	
Silicon 7440-21-3 Chip (Die)	1.380	7.790	13,800	2.15	(mg) Total	Die Attach	% of Total Weight	0.38
Doped Gold 7440-57-5 Wire Bond	0.320	1.806	3,200	2.10	Silver	7440-22-4	80.00	0.50
		15.524	27,500		Epoxy Resin	Trade Secret	17.00	
Tin 7440-31-5 Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hou		564.500	1,000,000			7440-50-8	3.00	
	5: 100.000	364.300	1,000,000		Copper			
0.5645 g Total Mass						Total	100.00	
niconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65 ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	5/EU (RoHS Re	ecast Directive) and with	7.79	(mg) Total	Chip (Die)	% of Total Weight	1.38
nnce with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test d	lata.		ľ		Silicon	7440-21-3	100	
nical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor d logy Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavo al substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.						Total	100.00	•
compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of da.com/global/eng/pages/offerings/industries/chemicals/plastics/	atabases to ob	tain a test rep	ort at	1.81	(mg) Total	Wire Bond	% of Total Weight	0.32
tective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" ox and certain "reels" may be made from PVC plastic.	used to hold t	he packing sli	p on the		Doped Gold	7440-57-5	100.00	
ip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Tec in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in erial suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have blers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon	Microchip Teo Material Safety been provided e weight of an	chnology Inco y Data Sheets by subcontrac ticipated sign	rporated provided by t ificant toxic			Total	100.00	
ip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in th warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms d in Microchip's quotations, sales order acknowledgement, and invoices.				15.52	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	2.75
		or indirect co	nsequential					
ip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any da wise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (N (SGS) or of this Certificate of Compliance for semiconductor products.					Tin	7440-31-5	100.00	

EKE 48-TSOP 11:14 AM : 8/29/2013

<u> ИІСВОСНІР</u>				nation Base A pper Alloy (C	•		•	ogeneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: TO and ZB 0	3 (Lead) TO-92 (A2 / AU)								e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	114.11	(mg) Total	Mold Compound	% ot Total Weight	56.77
Silica, vitreous	60676-86-0	Mold Compound	48.255	96.992	482,545		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.477	6.989	34,772		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.477	6.989	34,772		Phenolic Resin	Trade Secret	6.13	
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.391	2.796	13,909		Epoxy, Cresol Novolac	29690-82-2	2.45	
Carbon Black	1333-86-4	Mold Compound	0.170	0.342	1,703		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	38.024	76.428	380,239			Total	100.00	
Iron	7439-89-6	Lead Frame	0.935	1.880	9,353	80.00	(mg) Total	Lead Frame	% of Total Weight	39.8
Silver	7440-22-4	Lead Frame	0.758	1.524	7,582		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.050	0.100	498		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.033	0.066	328		Silver	7440-22-4	1.91	
Silver	7440-22-4	Die Attach	0.066	0.134	664		Zinc	7440-66-6	0.13	
Epoxy Resin	9003-36-5	Die Attach	0.017	0.034	169		Phosphorous	7723-14-0	0.08	
t-Butyl phenyl glycidyl ether	3101-60-8	Die Attach	0.006	0.011	57			Total	100.00	
Phenolic hardener	92-88-6	Die Attach	0.000	0.001	3	0.18	(mg) Total	Die Attach	% of Total Weight	0.09
Butyl cellosolve acetate	112-07-2	Die Attach	0.001	0.001	7		Silver	7440-22-4	74	
Silicon	7440-21-3	Chip (Die)	0.800	1.608	8,000		Epoxy Resin	9003-36-5	19	
Gold	7440-57-5	Wire Bond	0.040	0.080	400	1	t-Butyl phenyl glycidyl ether	3101-60-8	6	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.500	5.025	25,000		Phenolic hardener	92-88-6	0	
		TOTALS:	100.000	201.000	1,000,000		Butyl cellosolve acetate	112-07-2	1	
	0.2010	g Total Mass								
			IS Recast Direc	ctive) and with	EU	1.61	Total (mg)	Total Chip (Die)	100.00 % of Total Weight	0.8
is semiconductor device and its homogenous materials comply ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via int	with EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	IS Recast Direc	ctive) and with	EU	1.61	Total (mg) Doped Silicon			0.8
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 20 sernal design controls al substance is NOT a ent, there is no credit	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concer	, to the best of	Microchip Te	chnology	1.61		Chip (Die)	% of Total Weight	0.8
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via interpretable to the chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume	with EU Directive 20 dernal design controls al substance is NOT a ent, there is no credit allatory scheme world bility standard for pla	DO2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concerwide.	, to the best of ntration of the	Microchip Techemical subs	chnology	0.08		Chip (Die) 7440-21-3	% of Total Weight	0.8
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into the chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this documey, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flamma	with EU Directive 20 dernal design controls al substance is NOT a ent, there is no credit allatory scheme world bility standard for pla stics/	DO2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concerwide. In its constant in the semiconductor device and semiconductor device and semiconductor device and semiconductor device and semiconductor device.	, to the best of ntration of the o obtain a test	Microchip Techemical subs	chnology stance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via interpretation in the chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped and	with EU Directive 20 dernal design controls al substance is NOT a ent, there is no credit allatory scheme world bility standard for pla stics/ ere made from polyvin is form concerning s as knowledge and bel een compiled based o ad some information as and the average we	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concerwide. In a stice. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he cubstances restricted by RoHS in Microchip Technology In itef, as of the date listed in this form. Microchip Technolog in the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers a gight of anticipated significant toxic metals components. T	, to the best of ntration of the o obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materi	Microchip Techemical substreport at slip on the outer semiconductor d cannot guaraterial suppliers. In suppliers. In suppliers.	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flamma per/l/ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped at tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts	with EU Directive 20 dernal design controls al substance is NOT a ent, there is no credit allatory scheme world bility standard for pla stics/ ere made from polyvin is form concerning s as knowledge and bel een compiled based o and some information as and the average we in silicon devices (si cy, express or implied	DO2/95/EC (ROHS Directive), EU Directive 2011/65/EU (ROHS, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concerwide. In a stice. You can access the UL iQTM family of databases the concermination of the concermin	to the best of ntration of the oo obtain a test old the packing accrporated's a gy incorporated by raw materiahese estimate:	Microchip Techemical substreport at slip on the outsemiconductod cannot guaraterial supplie all suppliers. It is do not including sive, limited p	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical properties in the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL.94 V0 flamma pt://ul.com/global/eng/pages/offerings/industries/chemicals/plase is protective "tubes" in which the specific product is shipped at tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets and provided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained with crochip Technology Incorporated does not provide any warrant rranties provided by Microchip Technology Incorporated and it	with EU Directive 20 sernal design controls al substance is NOT a ent, there is no credit altatory scheme world billity standard for pla stics/ re made from polyvin is form concerning s is knowledge and bel een compiled based o nd some information a and the average we in silicon devices (si cy, express or implied s subsidiaries are co	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concerwide. astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In leif, as of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers a light of anticipated significant toxic metals components. Tilcon IC) in the finished parts. I, with respect to the information provided in this declarated in Microchip's standard terms and conditions of standard terms and conditions of standard terms and conditions of standard terms and data to the liable for any damages, diet to be a provided and the liable for any damages, diet place in the liable for any damages.	, to the best of ntration of the coordinates of the packing accorporated's say Incorporate vided by raw mand raw materihese estimate:	Microchip Techemical substreport at slip on the outsemiconductod cannot guaraterial suppliers. It is do not include sive, limited per provided in Marconsequentia, consequentia	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct ficrochip's	0.08	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00	0.04
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flamma pi/ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped at tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets are provided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained with excochip Technology Incorporated does not provide any warrant tranties provided by Microchip Technology Incorporated and it otations, sales order acknowledgement, and invoices. Crochip disclaims any duty to notify users of updates or change rerwise, suffered by users or third parties as a result of the use	with EU Directive 20 sernal design controls al substance is NOT a ent, there is no credit altatory scheme world billity standard for pla stics/ re made from polyvin is form concerning s is knowledge and bel een compiled based o nd some information a and the average we in silicon devices (si cy, express or implied s subsidiaries are co	D02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concerwide. astics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to he ubstances restricted by RoHS in Microchip Technology In leif, as of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers a light of anticipated significant toxic metals components. Tilcon IC) in the finished parts. I, with respect to the information provided in this declarated in Microchip's standard terms and conditions of standard terms and conditions of standard terms and conditions of standard terms and data to the liable for any damages, diet to be a provided and the liable for any damages, diet place in the liable for any damages.	, to the best of ntration of the coordinates of the packing accorporated's say Incorporate vided by raw mand raw materihese estimate:	Microchip Techemical substreport at slip on the outsemiconductod cannot guaraterial suppliers. It is do not include sive, limited per provided in Marconsequentia, consequentia	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct ficrochip's	0.08	Doped Silicon (mg) Total Doped Gold (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.04

TO ZB 3 TO-92 11:14 AM : 8/29/2013

MICROCHIP Semiconductor Device	Type: AB 03 (Lead)	TO-220 (F8)		nation Base A	•			ogeneous Materials: .g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	.,,,	"Contained In"	% Total	1						
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	536.44	(mg) Total	Mold Compound	% ot Total Weight	28.38
Fused Silica	60676-86-0	Mold Compound	24.974	472.066	249,744		Fused Silica	60676-86-0	88.00	1
Epoxy Resin 1	Trade Secret	Mold Compound	0.922	17.434	9.224		Epoxy Resin 1	Trade Secret	3.25	
Epoxy Resin 2	Trade Secret	Mold Compound	0.851	16.093	8,514		Epoxy Resin 2	Trade Secret	3.00	
Phenol Resin	Trade Secret	Mold Compound	1.277	24.140	12,771		Phenol Resin	Trade Secret	4.50	
Carbon Black	1333-86-4	Mold Compound	0.071	1.341	710		Carbon Black	1333-86-4	0.25	1
Misc.	Trade Secret	Mold Compound	0.284	5.364	2,838		Undeclared	Trade Secret	1.00	i
Copper	7440-50-8	Lead Frame	68.874	1301.860	688,742		Gridobiarod	Total	100.00	4
Tin	7440-31-5	Lead Frame	0.116	2.193	1.160	1329.38	(mg) Total	Lead Frame	% of Total Weight	70.33
	7440-31-3			25.325	,	1329.38				70.33
Silver Silver (Aa)	7440-22-4	Lead Frame Die Attach	1.340 0.063	25.325 1.187	13,398 628		Copper	7440-50-8	97.93 0.17	I
Silver (Ag) Proprietary Resin	7440-22-4 Trade Secret	Die Attach	0.063	0.280	628 148		Tin Silver	7440-31-5 7440-22-4	0.17 1.91	ł
							Silver			1
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.002	0.045	24			Total	100.00	
Silicon	7440-21-3	Chip (Die)	0.600	11.341	6,000	1.51	(mg) Total	Die Attach	% of Total Weight	0.08
Gold	7440-57-5	Wire Bond	0.050	0.945	500		Silver (Ag)	7440-22-4	79	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.560	10.585	5,600		Proprietary Resin	Trade Secret	19	
		TOTALS:	100.000	1,890.200	1,000,000	Proprietary	Curing agent & Hardener	Trade Secret	3	
	1 8902	g Total Mass						Total	100.00	-
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified v		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rols, supplier declarations, and /or analytical test data.	HS Recast Dire	ctive) and with	EU	11.34	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	0.6
, , , ,	via internal design control emical substance is NOT ocument, there is no credi	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	I, to the best of	Microchip Ted	chnology	11.34	, ,,	,		0.6
ompliance with the above EU Directives has been verified v a chemical substance is absent from the list above, the ch corporated's knowledge and belief as of the date of this do	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	I, to the best of ntration of the	Microchip Tec	chnology	0.95	, ,,	7440-21-3	100	
ompliance with the above EU Directives has been verified v a chemical substance is absent from the list above, the ch corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 fla	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. astics. You can access the UL iQTM family of databases to the content of the co	I, to the best of ntration of the to obtain a test	Microchip Tec chemical subs	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
ompliance with the above EU Directives has been verified was a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic.	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ ped are made from polyvia	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concest-wide. astics. You can access the UL iQTM family of databases in the control of the c	i, to the best of ntration of the to obtain a test	Microchip Tec chemical subs report at slip on the ou	chnology stance, if uter box and		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.05
ompliance with the above EU Directives has been verified v a chemical substance is absent from the list above, the ch- corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 fla ttp://ul.com/global/eng/pages/offerings/industries/chemicals he protective "tubes" in which the specific product is shipp	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ oed are made from polyvin in this form concerning s st of its knowledge and be uas been compiled based o ets and some information parts and the average we	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases in a concentration of the concentration of th	I, to the best of ntration of the to obtain a test old the packing ncorporated's s gy Incorporate wided by raw n and raw materi	Microchip Techemical substance of the conductor of cannot guaraterial supplies at suppliers. In	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.05
ompliance with the above EU Directives has been verified v a chemical substance is absent from the list above, the che corporated's knowledge and belief as of the date of this do ny, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 fla ttp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information teir original packing materials is true and correct to the besompleteness and accuracy of data in this form because it h formation is often protected from disclosure as trade secre provided only as estimates of the average weight of these	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work ammability standard for pl s/plastics/ oed are made from polyvin in this form concerning s at of its knowledge and be uas been compiled based of ets and some information parts and the average we d within silicon devices (s arranty, express or implie	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. lastics. You can access the UL iQTM family of databases in the control of the c	I, to the best of ntration of the to obtain a test old the packing ncorporated's a gy Incorporate vided by raw n and raw materi These estimate: tion. The exclu	Microchip Techemical substance of the conductor of cannot guaraterial suppliers. It is do not includisive, limited primited primited primited substance of the conductor of the	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.05
ompliance with the above EU Directives has been verified was a chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this dony, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flattp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the information teir original packing materials is true and correct to the besompleteness and accuracy of data in this form because it h formation is often protected from disclosure as trade secre provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained icrochip Technology Incorporated does not provide any was arranties provided by Microchip Technology Incorporated in the provided proporated grant provided by Microchip Technology Incorporated in the provided by Microchi	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work anmability standard for pl s/plastics/ oed are made from polyvin a in this form concerning s st of its knowledge and be uas been compiled based o parts and the average we d within silicon devices (s arranty, express or implie and its subsidiaries are co-	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. astics. You can access the UL iQTM family of databases to a concentration of the concentration of anticipated significant toxic metals components. The contained in the finished parts. d, with respect to the information provided in this declaration on the manual conditions of the contained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages.	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw materi These estimates tion. The exclusale. These are irect or indirect or indirect.	Microchip Techemical substance of the conductor of cannot guaraterial supplies as do not include sive, limited preprovided in Marcoconsequentia, consequentia, subsequential supplies and the consequential supplies provided in Marcoconsequential substance of the consequential subs	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct flicrochip's	0.95	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.05
ompliance with the above EU Directives has been verified value and chemical substance is absent from the list above, the checorporated's knowledge and belief as of the date of this doing, is not below the threshold of regulatory concern for any olding compounds used by Microchip meet the UL94 V0 flatp://ul.com/global/eng/pages/offerings/industries/chemicals the protective "tubes" in which the specific product is shippertain "reels" may be made from PVC plastic. Icrochip Technology Incorporated believes the information eir original packing materials is true and correct to the besompleteness and accuracy of data in this form because it he formation is often protected from disclosure as trade secre provided only as estimates of the average weight of these vels of dopants, metals, and non-metal materials contained icrochip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporated avoitations, sales order acknowledgement, and invoices. Icrochip disclaims any duty to notify users of updates or clerochip disclaims any duty to notify users of updates or clerochip disclaims any duty to notify users of updates or clerochip disclaims any duty to notify users of updates or clerochip disclaims any duty to notify users of updates as a result of the	via internal design control emical substance is NOT ocument, there is no credi y regulatory scheme work anmability standard for pl s/plastics/ oed are made from polyvin a in this form concerning s st of its knowledge and be uas been compiled based o parts and the average we d within silicon devices (s arranty, express or implie and its subsidiaries are co-	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. astics. You can access the UL iQTM family of databases to a concentration of the concentration of anticipated significant toxic metals components. The contained in the finished parts. d, with respect to the information provided in this declaration on the manual conditions of the contained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages.	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw materi These estimates tion. The exclusale. These are irect or indirect or indirect.	Microchip Techemical substance of the conductor of cannot guaraterial supplies at suppliers. It is do not include sive, limited preprovided in Marcochemical consequentials, consequentials, consequentials, substance of the consequentials of the consequentials of the consequential substance of the consequentials of the consequential of the consequentials of the consequential of the consequentials of the consequential of the con	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct flicrochip's	0.95	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.05

AB 3 TO-220 11:14 AM : 8/29/2013

Semiconductor Device	Гуре: AT 05 (Lead) TO	1-220 (B8)		nation Base A	- ,		•	ogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	526.92	(mg) Total	Mold Compound	% ot Total Weight	26.56
Fused Silica	60676-86-0	Mold Compound	23.373	463,693	233.728	1	Fused Silica	60676-86-0	88.00	
Epoxy Resin 1	Trade Secret	Mold Compound	0.863	17.125	8.632		Epoxy Resin 1	Trade Secret	3.25	
Epoxy Resin 2	Trade Secret	Mold Compound	0.797	15.808	7,968		Epoxy Resin 2	Trade Secret	3.00	
Phenol Resin	Trade Secret	Mold Compound	1.195	23.712	11,952		Phenol Resin	Trade Secret	4.50	
Carbon Black	1333-86-4	Mold Compound	0.066	1.317	664		Carbon Black	1333-86-4	0.25	
Misc.	Trade Secret	Mold Compound	0.266	5.269	2,656		Undeclared	Trade Secret	1.00	
Copper	7440-50-8	Lead Frame	70.627	1401.171	706,271			Total	100.00	
Tin	7440-31-5	Lead Frame	0.119	2.361	1,190	1430.79	(mg) Total	Lead Frame	% of Total Weight	72.12
Silver	7440-22-4	Lead Frame	1.374	27.257	13,739		Copper	7440-50-8	97.93	
Silver (Ag)	7440-22-4	Die Attach	0.071	1.402	707		Tin	7440-31-5	0.17	
Proprietary Resin	Trade Secret	Die Attach	0.017	0.330	167		Silver	7440-22-4	1.91	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.003	0.054	27			Total	100.00	
Silicon	7440-21-3	Chip (Die)	0.620	12,300	6.200	1.79	(mg) Total	Die Attach	% of Total Weight	0.09
Gold	7440-57-5	Wire Bond	0.040	0.794	400		Silver (Aa)	7440-22-4	79	
Tin		on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.570	11.308	5,700		Proprietary Resin	Trade Secret	19	
100	7 1 10 0 1 0 1 1 11111119	TOTALS:	100.000	1,983.900	1,000,000	Proprietary	Curing agent & Hardener	Trade Secret	3	
	1.9839 g To			,	,,	.,,	3 3	Total	100.00	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	HS Recast Dire	ctive) and with	EU	12.30	Total (mg)	Chip (Die)	% of Total Weight	0.62
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vi chemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this door	a internal design controls, sup mical substance is NOT an inte cument, there is no credible rea	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity conce	I, to the best of	Microchip Te	chnology	12.30	Total (mg) Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	0.62
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified victorial substance is absent from the list above, the che rporated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 V0 flar	a internal design controls, sup mical substance is NOT an inte cument, there is no credible rea regulatory scheme world-wide. mmability standard for plastics.	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and some to believe that the unavoidable impurity conce	d, to the best of entration of the	Microchip Tec chemical subs	chnology	0.79	,	7440-21-3	100	0.62
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories and solve the charge and belief as of the date of this do is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 flat //ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp	ia internal design controls, sup mical substance is NOT an inte cument, there is no credible rea regulatory scheme world-wide. nmability standard for plastics. /plastics/	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and isson to believe that the unavoidable impurity conce. You can access the UL iQTM family of databases	d, to the best of intration of the to obtain a test	Microchip Tec chemical subs report at	chnology tance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories with the above EU Directives has been verified victories and solve and belief as of the date of this doe is not below the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 V0 flat if under the series in which the specific product is shipped in "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information original packing materials is true and correct to the best pleteness and accuracy of data in this form because it has mation is often protected from disclosure as trade secret ovided only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained	a internal design controls, sup- mical substance is NOT an inte- zument, there is no credible rea- regulatory scheme world-wide. mmability standard for plastics. /plastics/ ed are made from polyvinyl chli- in this form concerning substan- of its knowledge and belief, as is been compiled based on the ts and some information may no parts and the average weight of within silicon devices (silicon I	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity conce. You can access the UL iQTM family of databases or orde (PVC) plastic. "Window envelopes" used to have sestricted by RoHS in Microchip Technology Is of the date listed in this form. Microchip Technologo ranges provided in Material Safety Data Sheets proto thave been provided by subcontract assemblers of anticipated significant toxic metals components. TC) in the finished parts.	i, to the best of intration of the to obtain a test old the packing incorporated's agy incorporate by ided by raw in and raw mater These estimate	Microchip Techemical substreport at g slip on the outsemiconductor d cannot guaraterial suppliers. It is do not include	thnology tance, if ter box and devices in intee the ers. Supplier formation le trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories. The chemical substance is absent from the list above, the cherporated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ting compounds used by Microchip meet the UL94 V0 flat (Vul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipped in "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information original packing materials is true and correct to the best pleteness and accuracy of data in this form because it hamation is often protected from disclosure as trade secre ovided only as estimates of the average weight of these is the secret ovided only as estimates of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of these is the contract of the average weight of the contract of t	a internal design controls, sup- mical substance is NOT an inte- cument, there is no credible rea- regulatory scheme world-wide. mmability standard for plastics. /plastics/ ed are made from polyvinyl chla- in this form concerning substan- of its knowledge and belief, as is been compiled based on the is and some information may in parts and the average weight of within silicon devices (silicon I rranty, express or implied, with	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and son to believe that the unavoidable impurity conce. You can access the UL iQTM family of databases or oride (PVC) plastic. "Window envelopes" used to have sestricted by RoHS in Microchip Technology I sof the date listed in this form. Microchip Technoloranges provided in Material Safety Data Sheets proto thave been provided by subcontract assemblers of anticipated significant toxic metals components. TC) in the finished parts.	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate by raw nater's These estimate tion. The exclusion of the second introduced in the second interest in the second intration of the second interest in the second intration of	Microchip Techemical substance of the control of th	ter box and devices in the theorem. Supplier information te trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories. The pliance with the above EU Directives has been verified victories with the above EU Directives has been verified victories. The provided is a soft he date of this doc is not below the threshold of regulatory concern for any fing compounds used by Microchip meet the UL94 VO flat "full.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. The protective is the information original packing materials is true and correct to the best pleteness and accuracy of data in this form because it ha mation is often protected from disclosure as trade secre worlded only as estimates of the average weight of these as of dopants, metals, and non-metal materials contained ochip Technology Incorporated does not provide any wa anties provided by Microchip Technology Incorporated a	a internal design controls, sup- mical substance is NOT an inte- tument, there is no credible rea- regulatory scheme world-wide. mmability standard for plastics. /plastics/ ad are made from polyvinyl chla- in this form concerning substan- of its knowledge and belief, as is been compiled based on the to and some information may no parts and the average weight of within silicon devices (silicon I contrarty, express or implied, with and its subsidiaries are contained anges to Material Content Decla users' reliance on the informa-	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity conces. You can access the UL iQTM family of databases or orde (PVC) plastic. "Window envelopes" used to home the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Is and Is of the finished parts. The provided in this declarated in Microchip's standard terms and conditions of the data and shall not be liable for any damages, data and shall not be liable for any damages, data.	i, to the best of intration of the to obtain a test old the packing incorporated by raw in and raw mater! These estimate tion. The exclusiale. These are irect or indirect	Microchip Techemical substreport at g slip on the outperformate in a suppliers. It is do not included by a provided in Matterial suppliers. It is do not included by a provided in Matterial substreport in Matterial substraints in a substraint in Matterial substraints in a substraint in a	ter box and devices in inter the error. Supplier information le trace	0.79	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.04
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vibenical substance is absent from the list above, the che porated's knowledge and belief as of the date of this does in not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flat //ul.com/global/eng/pages/offerings/industries/chemicals protective "tubes" in which the specific product is shippin "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information original packing materials is true and correct to the best poleteness and accuracy of data in this form because it he mation is often protected from disclosure as trade secreptical only as estimates of the average weight of these is of dopants, metals, and non-metal materials contained onchip Technology Incorporated does not provide any was anties provided by Microchip Technology Incorporated a ations, sales order acknowledgement, and invoices.	a internal design controls, sup- mical substance is NOT an inte- tument, there is no credible rea- regulatory scheme world-wide. mmability standard for plastics. /plastics/ ad are made from polyvinyl chla- in this form concerning substan- of its knowledge and belief, as is been compiled based on the to and some information may no parts and the average weight of within silicon devices (silicon I contrarty, express or implied, with and its subsidiaries are contained anges to Material Content Decla users' reliance on the informa-	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity conces. You can access the UL iQTM family of databases or orde (PVC) plastic. "Window envelopes" used to home the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Technology Is of the date listed in this form. Microchip Is and Is of the finished parts. The provided in this declarated in Microchip's standard terms and conditions of the data and shall not be liable for any damages, data and shall not be liable for any damages, data.	i, to the best of intration of the to obtain a test old the packing incorporated by raw in and raw mater! These estimate tion. The exclusiale. These are irect or indirect	Microchip Techemical substreport at g slip on the outperformate in a suppliers. It is do not included by a provided in Matterial suppliers. It is do not included by a provided in Matterial substreport in Matterial substraints in a substraint in Matterial substraints in a substraint in a	ter box and devices in inter the error. Supplier information le trace	0.79	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.04

AT 5 TO-220 11:14 AM : 8/29/2013

MICROCHIP Semiconductor David	Turner DT 20 TOF	D (TE)		nation Base A				ogeneous Materials: e.g. pc boards, display	/s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Devic	ce Type: PT 32 (Lead) TQF	` '								е3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	269.96	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous (or fused)	60676-86-0	Mold Compound	67.830	229,469	678.300		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	6.943	23.487	69,426		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.788	16.198	47,880	i	Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.239	0.810	2,394	1	Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.229	34.603	102,286	i	<u> </u>	Total	100.00	
Tin	7440-31-5	Lead Frame	0.026	0.089	263	35.52	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.200	0.677	2.000		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.019	0.064	189	1	Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.026	0.089	263	1	Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.623	2.106	6,225	J	Zinc	7440-66-6	0.18	
ANHYDRIDE	Trade Secret	Die Attach	0.068	0.228	675	J	Chromium	7440-47-3	0.25	
EPOXY RESIN	Trade Secret	Die Attach	0.060	0.203	600			Total	100.00	
Silicon	7440-21-3	Chip (Die)	7.500	25.373	75,000	2.54	(mg) Total	Die Attach	% of Total Weight	0.75
Gold	7440-57-5	Wire Bond	0.200	0.677	2,000		Silver (Ag)	7440-22-4	83	
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	4.229	12,500		ANHYDRIDE	Trade Secret	9	
		TOTALS:	100.000	338.300	1,000,000		EPOXY RESIN	Trade Secret Total	8	
s semiconductor device and its homogenous materials	0.3383 g To s comply with EU Directive 2002/95		IS Recast Direc	ctive) and with	EU	25.37	Total (mg)	0111 (011)	% of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive	a).	. ,								
, , ,	.,-					25.57	Total (mg)	Chip (Die)	% or rotal weight	7.5
mpliance with the above EU Directives has been verifie	ed via internal design controls, sup	•	, to the best of	Microchip Te	chnology	25.51	Doped Silicon	7440-21-3 Total	100 100.00	7.5
mpliance with the above EU Directives has been verified chemical substance is absent from the list above, the orporated's knowledge and belief as of the date of this r, is not below the threshold of regulatory concern for a lding compounds used by Microchip meet the UL94 VO	de via internal design controls, sup chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide.	entional ingredient in the semiconductor device and isson to believe that the unavoidable impurity concer	ntration of the	chemical subs		0.68	1	7440-21-3	100	0.2
ompliance with the above EU Directives has been verifies a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this y, is not below the threshold of regulatory concern for a colding compounds used by Microchip meet the UL94 V0 pp://ul.com/global/eng/pages/offerings/industries/chemies protective "tubes" in which the specific product is she	d divia internal design controls, sup chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide. I flammability standard for plastics cals/plastics/	ntional ingredient in the semiconductor device and son to believe that the unavoidable impurity concerving the control of the	ntration of the o	chemical subs	stance, if		Doped Silicon	7440-21-3 Total	100	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ly, is not below the threshold of regulatory concern for a colding compounds used by Microchip meet the UL94 V0 tp://ul.com/global/eng/pages/offerings/industries/chemine protective "tubes" in which the specific product is shritain "reels" may be made from PVC plastic.	d via internal design controls, sup chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide. I flammability standard for plastics cals/plastics/ nipped are made from polyvinyl chl	nntional ingredient in the semiconductor device and son to believe that the unavoidable impurity concert. You can access the UL iQTM family of databases to bride (PVC) plastic. "Window envelopes" used to he	ntration of the o	report at	stance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verifies a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ly, is not below the threshold of regulatory concern for a colding compounds used by Microchip meet the UL94 V0 tp://ul.com/global/eng/pages/offerings/industries/chemine protective "tubes" in which the specific product is she	de via internal design controls, sup chemical substance is NOT an inter- document, there is no credible rea any regulatory scheme world-wide. I flammability standard for plastics- cals/plastics/ hipped are made from polyvinyl chl- cion in this form concerning substate best of its knowledge and belief, as it has been compiled based on the ecrets and some information may no ese parts and the average weight of	entional ingredient in the semiconductor device and son to believe that the unavoidable impurity concerns on the believe that the unavoidable impurity concerns on the believe that the unavoidable impurity concerns of the CPVC) plastic. "Window envelopes" used to have sestricted by RoHS in Microchip Technology Ir of the date listed in this form. Microchip Technology aranges provided in Material Safety Data Sheets provided by subcontract assemblers in anticipated significant toxic metals components. To	o obtain a test old the packing accorporated's s gy Incorporated vided by raw m and raw materi	report at slip on the outline of the conductor of the conductor of cannot guaranterial suppliers. In a suppliers.	stance, if uter box and r devices in antee the ers. Supplier		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this y, is not below the threshold of regulatory concern for a colding compounds used by Microchip meet the UL94 V0 tp://ul.com/global/eng/pages/offerings/industries/chemical productive "tubes" in which the specific product is shortain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informate in original packing materials is true and correct to the I impleteness and accuracy of data in this form because formation is often protected from disclosure as trade se provided only as estimates of the average weight of the	ed via internal design controls, sup chemical substance is NOT an inter- document, there is no credible rea any regulatory scheme world-wide. I flammability standard for plastics cals/plastics/ hipped are made from polyvinyl chl- cion in this form concerning substan- best of its knowledge and belief, as it has been compiled based on the excrets and some information may no ese parts and the average weight or oned within silicon devices (silicon I	entional ingredient in the semiconductor device and son to believe that the unavoidable impurity concerns to believe that the unavoidable impurity concerns to be the unavoidable impurity concerns to be under the unavoidable impurity concerns to be under the unavoidable under the unavoidable under the unavoidable under the unavoidable under the	o obtain a test old the packing accorporated's s gy Incorporated vided by raw m and raw materi hese estimates	report at slip on the outline of cannot guaraterial suppliers. It is do not included by the control of cannot guaraterial suppliers and suppliers of control of cannot guaraterial suppliers. It is do not included by the control of cannot guaraterial suppliers. It is do not included by the control of cannot guaraterial suppliers and suppliers are control of cannot guaraterial suppliers.	stance, if uter box and r devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.2
impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this by, is not below the threshold of regulatory concern for a belding compounds used by Microchip meet the UL94 VO pt/lul.com/global/eng/pages/offerings/industries/chemic e protective "tubes" in which the specific product is shratin "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the informat beir original packing materials is true and correct to the Impleteness and accuracy of data in this form because ormation is often protected from disclosure as trade se provided only as estimates of the average weight of the els of dopants, metals, and non-metal materials contain crochip Technology Incorporated does not provide any irranties provided by Microchip Technology Incorporated properated provided properated provided properated provided properated provided pro	ed via internal design controls, sup chemical substance is NOT an interdocument, there is no credible rea any regulatory scheme world-wide. If all all all all all all all all all al	Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity concert. You can access the UL iQTM family of databases to bride (PVC) plastic. "Window envelopes" used to be concess restricted by RoHS in Microchip Technology In a of the date listed in this form. Microchip Technolog ranges provided in Material Safety Data Sheets proof thave been provided by subcontract assemblers a anticipated significant toxic metals components. To in the finished parts. Tespect to the information provided in this declarated in Microchip's standard terms and conditions of starations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages.	o obtain a test old the packing accorporated's s gy Incorporated vided by raw m and raw materi rhese estimates sale. These are	report at slip on the outsemiconducto d cannot guaraterial suppliers. It is do not include sive, limited p e provided in M , consequenti	stance, if Interpolation and the stance of	0.68	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00	0.2
pliance with the above EU Directives has been verifies themical substance is absent from the list above, the prorated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for a ding compounds used by Microchip meet the UL94 Vol'ul.com/global/eng/pages/offerings/industries/chemic protective "tubes" in which the specific product is shain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the informat original packing materials is true and correct to the lipleteness and accuracy of data in this form because mation is often protected from disclosure as trade se ovided only as estimates of the average weight of the is of dopants, metals, and non-metal materials contain ochip Technology Incorporated does not provide any anties provided by Microchip Technology Incorporated into provide any anties, sales order acknowledgement, and invoices. ochip disclaims any duty to notify users of updates o rwise, suffered by users or third parties as a result of	ed via internal design controls, sup chemical substance is NOT an interdocument, there is no credible rea any regulatory scheme world-wide. If all all all all all all all all all al	Intional ingredient in the semiconductor device and son to believe that the unavoidable impurity concert. You can access the UL iQTM family of databases to bride (PVC) plastic. "Window envelopes" used to be concess restricted by RoHS in Microchip Technology In a of the date listed in this form. Microchip Technolog ranges provided in Material Safety Data Sheets proof thave been provided by subcontract assemblers a anticipated significant toxic metals components. To in the finished parts. Tespect to the information provided in this declarated in Microchip's standard terms and conditions of starations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages.	o obtain a test old the packing accorporated's s gy Incorporated vided by raw m and raw materi rhese estimates sale. These are	report at slip on the outsemiconducto d cannot guaraterial suppliers. It is do not include sive, limited p e provided in M , consequenti	stance, if Iter box and Iter devices in antee the ers. Supplier aformation de trace roduct Aicrochip's	0.68	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.2

PT 32 TQFP 11:15 AM : 8/29/2013

Basic Substance CAS Number SUb-Component Weight mg/part ppm 218.09 (mg) Total Moid Compound No. 4 Total Weight Section Moid Compound 9.03.41 109.35 1	MICROCHIP				nation Base A pper Alloy (C	•		•	ogeneous Materials: g. pc boards, display:	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Basic Substance CAS Number COCREGIO Medic Compound 63 de 1985	Semiconductor Device Type	e: PT 44 (Lead)	TQFP 10x10x1mm (T4/TY)								e3
Basic Substance Cas Number Support Reservice December 1998 Export Reservice December 1998			"Contained In"	% Total							
Egoor Resin Rib Dismonie, Not distinitinant (rotations) Trade Secret Modi Correculord 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 11,454 4,078 1,000	Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	218.09	(mg) i otai	Moia Compouna	% of Total Weight	1 /9.8
Phenoix Resin Pike BY C. SSC). No disaminory trooks) Traise Secret Traise	Silica, vitreous	60676-86-0	Mold Compound	69.354	189.545	693,542		Silica, vitreous	60676-86-0	86.91	
Copper 744-90-98 Lead Frame 10.00 27-31 10.003 10.0										7.67	
Copper 1440-50-8 Lead Frame 1,0000 27.33 1,00,003 27.33 1,00,000 2											
Silver 7440-02-0 Lead Frame 0.267 0.729 2.657 28.70 (mg) Total Lead Frame 1.5								Carbon Black			_
Silver 7440-22-4 Lead Frame 0.175 0.470 1.752 Silver 7440-50-5 Silver 7440											
Silcon 7440-21-3 Lead Frame 0.047 0.129 473 Shert Art Magnesium 7440-22-4 De Attach 0.001 0.029 105 Shert Art Art Art Art Art Art Art Art Art A							28.70				t 10.5
Magnesium 7439-95-4 Lead Frame 0.011 0.029 105 Silver (April 1049-02-24 104 1150) Acrystal Uerthane Oligomer General De Attach 0.600 1.640 6.000 Magnesium 7449-95-4 0.64 Attach 0.600 1.640 6.000 Magnesium 7449-95-4 0.65 Magnesium 7449-95-4 0.65 Magnesium 7449-95-4 0.65 Magnesium 7449-95-6 1.010 Magnesium 7449-95-9 1.010 Magnesium 1449-95-9 1.010 Magnesiu											
Silver (Ag) 1 7440-22-4 Die Attach 0.600 1.660 0.600 1.600 1.600 Mappeaum 7430-24-3 0.60 Mappeaum 7430-96-4 0.10 Mappeaum 7430											1
Acysted Urethaine Oligomer Silicon 7440-271-3 Chip (De) 7500											
Silicon 7440-27-3 Chip (Die) 7500 20-489 75,000 20-58 (ms) Total 100.00 Tin 7440-57-5 Prize on examinating less (prize) - Maries Tri / sensible at 150°C for 1040 20-58 (ms) Total 200.00 0.2733 g Total Mass 0.2734 g Total Mass 0.2735 g Total Mass 0.2735 g Total Mass 0.2736 (RoHS Directive) 2007/58/EC (RoHS Directive). EU Directive 2011/65/EU (RoHS Recast Directive) and with EU are a completated at 15 months of the sensition of the chemical substance is absent from the list above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. 1 a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated show ether through of error ary regulatory concern for any regulatory scheme vorlet-vide. 1 chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated show ether or any regulatory scheme vorlet-vide. 2 chemical substance is absent from the list above ether U.94 V0 flammability standard for plastics. You can access the U.1GTM family of databases to obtain a test report at trust full configuration of the chemical substance in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology incorporated delivers the information in this form securities of the everage weight of these parts and the average weight of these parts and the average weight of anticipated significant toxic metals completeness and some information may not have been provided by Microchip's technology incorporated does not provide any warranty, express or implied, with respect to the information in Material Schot) and sequences of the expression of the expresi											
Gold 7440-57-5 Wire Born 1 7440-51-5 Wire Bo								Magnesium			_
Tin 7440-31-5 Pating on external leads party - Matter Tin / amousted at 1900 between 1,250 3.416 12,500											
1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							2.05				t 0.75
0.2733 g Total Mass O.2733 g Total Mass O.2734 g	Tin	7440-31-5									
This semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive) 2002/95/EC (RoHS Di			TOTALS:	100.000	273.300	1,000,000		Acrylate Urethane Oligomer			
Directive 2002/53/EC (Encl-of-Life Vehicles (ELV) Directive). 20.50 Total (mg) Chip (Die) % of Total Weight 7.5 Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. 4 a chemical substance is absent from the list above, the chemical substance is in the same of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if my, is not below the threshold of regulatory concern for any regulatory scheme world-wide. 8 (mg) Total Wire Bond % of Total Weight 0.2 8 (mg) Total Wire Bond % of Total Weight 0.2 9 (mg) Total Wire Bond % of Total Wei		0.2733	g Total Mass						Total	100.00	Ī
to chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if with the threshold of regulatory concern for any regulatory scheme world-wide. Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/en/g/pages/offerings/industries/chemicals/plastics/ Microchip Technology in the outer box and access the provided by a provided from PVC plastic. Microchip Technology incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided by a Material Safety Data Sheets provided by a material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by a subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by a subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by a subcontract assemblers and raw material suppliers. Information is often protected from disclosure as trade secrets and some information may not have been provided by a Material Safety Data Sheets provided by a material suppliers. Information is often protected from disclosure as trade in this form of the provid	Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		,	S Recast Direc	ctive) and with	n EU	20.50		,		t 7.5
The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and likerochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form devices (slinon) to these parts and the average weight of anticipated significant toxic metals contained parts. Microchip Technology Incorporated does not provided and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's leads good and the average weight of these parts and the average weight of microchip are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's leads (pins) - Microchip Technology Incorporated does not provide and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's leads (pins) - Microchip and invoices. Total 100.00 Total Wire Bond 7440-57-5 100 Doped Gold 7440-57-5 100 Doped Gold 7440-57-5 100 Total 100.00 Total	Compliance with the above Lo Directives has been verified via int	ernar design control	s, supplier deciarations, and for analytical test data.					Doped Silicon			
http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and sertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in heir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided by subcontract assemblers and raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of anticipated significant toxic metals components. These estimates do not include trace evels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip's the exclusive in the exclusive in th	Incorporated's knowledge and belief as of the date of this docume any, is not below the threshold of regulatory concern for any regu	ent, there is no credil latory scheme world	ole reason to believe that the unavoidable impurity concern-wide.	tration of the	chemical subs				Total	100.00	
Doped Gold 7440-57-5 100.00 Wilcrochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier normation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace evels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Wicrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's uportation, sales order acknowledgement, and invoices. Wilcrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or this Certificate of Compliance for semiconductor products.			astics. You can access the UL iQTM family of databases to	o obtain a test	report at		0.55	(mg) Total	Wire Bond	% of Total Weight	t 0.2
Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in heir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information sprovided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace evels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product varranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's provided in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in Microchip's and in Microchip's standard terms and conditions of sale. These are provided in Microchip's and in	The protective "tubes" in which the specific product is shipped ar certain "reels" may be made from PVC plastic.	re made from polyvin	yl chloride (PVC) plastic. "Window envelopes" used to ho	ld the packing	slip on the ou	uter box and		Doped Gold	7440-57-5	100	
heir original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information in often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace evels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or the party test reports (SGS) or of this Certificate of Compliance for semiconductor products. Tin 7440-31-5 100.00	Microship Tochnology Incorporated believes the information in th	is form concorning s	upstanges restricted by PoUS in Microshin Technology In	corporatod's	omiconducto	r dovices in		U	Total	100.00	4
varranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.	their original packing materials is true and correct to the best of it completeness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets an is provided only as estimates of the average weight of these parts	es knowledge and belten compiled based of the some information and the average we	ief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers a ight of anticipated significant toxic metals components. Ti	y Incorporated vided by raw m and raw materi	d cannot guara naterial supplical al suppliers. In	antee the ers. Supplier nformation					
otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or 5 this Certificate of Compliance for semiconductor products.							3.42	(mg) Total	leads (pins) - Matte Tin	% of Total Weight	t 1.25
Total 100.00								Tin	7440-31-5	100.00	
								Ш	Total	100 00	-

PT 44 TQFP 11:15 AM: 8/29/2013

MICROCHIP				nation Base /			•	ogeneous Materials: .g. pc boards, display	/s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: PT 64 (Lead)	TQFP 10x10x1mm (V2/VG)								e3
	<u> </u>	"Contained In"	% Total		1			I		
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	228.79	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	198.838	693,542		Silica, vitreous	60676-86-0	86.91	1
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	6.121	17.548	61,207	i	Epoxy Resin	Trade Secret	7.67	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.078	11.691	40,778	1	Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.709	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.000	28.671	100.003		Carbon Black	Total		Ш
						20.40	() T .(.)			
Nickel	7440-02-0	Lead Frame	0.267	0.765	2,667	30.10	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.175	0.502	1.752		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.047	0.135	473	i	Nickel	7440-02-0	2.54	
Magnesium	7439-95-4	Lead Frame	0.047	0.030	105		Silver	7440-22-4	1.67	
Silver (Aa)	7440-22-4	Die Attach	0.600	1.720	6.000		Silicon	7440-22-4	0.45	
Acrylate Urethane Oligomer	General	Die Attach	0.600	0.430	1.500		Magnesium	7439-95-4	0.45	
					,	l	Magnesium			1
Silicon	7440-21-3	Chip (Die)	7.500	21.503	75,000			Total		
Gold	7440-57-5	Wire Bond	0.200	0.573	2,000	2.15	(mg) Total	Die Attach	% of Total Weight	0.75
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	3.584	12,500		Silver (Ag)	7440-22-4	80	
		TOTALS:	100.000	286.700	1,000,000		Acrylate Urethane Oligomer	General	20	
	0 2867	g Total Mass						Total	100.00	
semiconductor device and its homogenous materials comply	with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol	IS Recast Direct	ctive) and witl	h EU	21.50	Total (mg)	01: (5:)	0/ -f T-t- M-:	7.5
						21.50		Chip (Die)	% of Total Weight	7.5
npliance with the above EU Directives has been verified via int	•	· · · · · · · · · · · · · · · · · · ·				21.30	Doped Silicon	7440-21-3	100	
pliance with the above EU Directives has been verified via int hemical substance is absent from the list above, the chemica porated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regu	al substance is NOT ent, there is no credil alatory scheme world	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	ntration of the	chemical sub		21.30			100	
npliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemica proprated's knowledge and belief as of the date of this docume , is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma	al substance is NOT ent, there is no credi latory scheme world bility standard for pl	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce I-wide.	ntration of the	chemical sub		0.57		7440-21-3	100	
mpliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume r, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma o://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped are	al substance is NOT ent, there is no credi ulatory scheme world bility standard for pl stics/	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce 1-wide. astics. You can access the UL iQTM family of databases	ntration of the	report at	stance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.2
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via int inchemical substance is absent from the list above, the chemica oroporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped ar tain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this irroriginal packing materials is true and correct to the best of it mpleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained with	al substance is NOT ent, there is no credil alatory scheme work bility standard for pl stics/ re made from polyvir is form concerning s ts knowledge and be ten compiled based of d some information and the average we	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access to the database access to the	ntration of the to obtain a test old the packing ncorporated's gy Incorporated vided by raw n and raw materi	report at slip on the o semiconducto d cannot guar naterial supplial suppliers.	stance, if uter box and or devices in antee the iers. Supplier	0.57	Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.2
mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flamma pi/ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped artain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts	al substance is NOT ent, there is no credital ent, there is no credital ilatory scheme work bility standard for pl stics/ re made from polyvir is form concerning s is knowledge and be sen compiled based of d some information is and the average we in silicon devices (si y, express or implier	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access the UL iQTM family of databases and children access to the database access to the information in Microchip Technology I lief, as of the date listed in this form. Microchip Technologo the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers eight of anticipated significant toxic metals components. Illicon IC) in the finished parts. d, with respect to the information provided in this declaration.	ntration of the to obtain a test to obtain a test old the packing incorporated's agy Incorporated by raw nand raw mater: These estimate: tion. The exclu	report at g slip on the o semiconducto d cannot guar naterial suppliers. I as do not inclu sive, limited p	stance, if uter box and or devices in cantee the iers. Supplier information de trace	0.57	Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.2
mpliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemical properties of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma by/ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped at tain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in the irroriginal packing materials is true and correct to the best of it in pleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an rovided only as estimates of the average weight of these parts els of dopants, metals, and non-metal materials contained with rochip Technology Incorporated does not provide any warrant ranties provided by Microchip Technology Incorporated and it	al substance is NOT ent, there is no credit ent, there is no credit ent y scheme work bility standard for pl stics/ ere made from polyvir is form concerning s ts knowledge and be ent compiled based of do some information s and the average we in silicon devices (si y, express or implies s subsidiaries are co	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children consider the constant of the substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers elight of anticipated significant toxic metals components. Illicon IC) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, described in the provided in the declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the conditi	ntration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw in and raw materithese estimate: tion. The exclusale. These are irect or indirect or indirect.	report at g slip on the o semiconducto d cannot guar naterial suppli ial suppliers. Is d on to inclu sive, limited p e provided in t, consequent	uter box and or devices in antee the iers. Supplier information de trace product Microchip's	0.57	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.2
npliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemical proporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma by/ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped at alin "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this roriginal packing materials is true and correct to the best of it in pleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleteness and accuracy of data in this form because it has be impleted by as expensed to the second of	al substance is NOT ent, there is no credit ent, there is no credit ent y scheme work bility standard for pl stics/ ere made from polyvir is form concerning s ts knowledge and be ent compiled based of do some information s and the average we in silicon devices (si y, express or implies s subsidiaries are co	an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases and children consider the constant of the substances restricted by RoHS in Microchip Technology I lief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers elight of anticipated significant toxic metals components. Illicon IC) in the finished parts. d, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, described in the provided in the declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the Declarations and shall not be liable for any damages, described in the conditions of the conditi	ntration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw in and raw materithese estimate: tion. The exclusale. These are irect or indirect or indirect.	report at g slip on the o semiconducto d cannot guar naterial suppli ial suppliers. Is d on to inclu sive, limited p e provided in t, consequent	uter box and or devices in antee the iers. Supplier information de trace product Microchip's	0.57	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	1.25

PT 64 TQFP 11:15 AM : 8/29/2013

MICROCHIP Semiconductor Device	e Tyne DT 64 (Leed	TQFP 14x14x1mm (V3 / VH)		nation Base A	•		•	ogeneous Materials: .g. pc boards, display	/s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Devic	te Type. F1 04 (Lead	"Contained In"	% Total					T.		63
Basic Substance	CAS Number	Sub-Component	Weight	mg/part		289.33	(mg) Total	Mold Compound	% ot Total Weight	53.58
	60676-86-0	•			ppm 455, 400		C::: : : : : (f)	60676-86-0	05.00	1
Silica, vitreous (or fused) Epoxy Resin	Trade Secret	Mold Compound Mold Compound	45.543 4.661	245.932 25.172	455,430 46,615		Silica, vitreous (or fused)	Trade Secret	85.00 8.70	
Phenolic Resin	Trade Secret	Mold Compound	3.215	17.360	32.148		Epoxy Resin Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.161	0.868	1.607		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	32.381	174.856	323,807		Carbon Black	Total		<u>J</u>
Tin	7440-31-5	Lead Frame	0.083	0.449	831	179.50	() T .(.)			20.04
						179.50	(mg) Total	Lead Frame	% of Total Weight	33.24
Silver	7440-22-4	Lead Frame	0.633	3.419	6,332		Copper	7440-50-8	97.42	
Zinc Chromium	7440-66-6 7440-47-3	Lead Frame Lead Frame	0.060	0.323 0.449	598 831		Tin	7440-31-5 7440-22-4	0.25	
	7440-47-3			6.096	11.288		Silver		1.91	
Silver (Ag) ANHYDRIDE		Die Attach Die Attach	1.129 0.122	0.661	11,288		Zinc Chromium	7440-66-6 7440-47-3	0.18 0.25	
	Trade Secret	Die Attach					Chromium]
EPOXY RESIN	Trade Secret		0.109	0.588	1,088			Total		
Silicon	7440-21-3	Chip (Die)	10.540	56.916	105,400	7.34	(mg) Total	Die Attach	% of Total Weight	1.36
Gold	7440-57-5	Wire Bond	0.340	1.836	3,400		Silver (Ag)	7440-22-4	83	
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.940	5.076	9,400		ANHYDRIDE	Trade Secret	9	
		TOTALS:	100.000	540.000	1,000,000		EPOXY RESIN	Trade Secret	8	J
	0 5400	g Total Mass								
		<u> </u>						Total	100.00	
his semiconductor device and its homogenous materials irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive	comply with EU Directive 2	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	IS Recast Direc	ctive) and with	ı EU	56.92	Total (mg)	Chip (Die)	% of Total Weight	10.54
	comply with EU Directive 2).	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	IS Recast Direc	ctive) and with	i EU	56.92	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the	comply with EU Directive 2). d via internal design contro chemical substance is NOT document, there is no cred	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohls, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	, to the best of	Microchip Te	chnology	56.92		Chip (Die)	% of Total Weight	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a	comply with EU Directive 2). d via internal design contro chemical substance is NOT document, there is no cred any regulatory scheme worl flammability standard for p	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohls, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conce	l, to the best of ntration of the	Microchip Te chemical subs	chnology	56.92		Chip (Die) 7440-21-3	% of Total Weight	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a olding compounds used by Microchip meet the UL94 V0 ttp://ul.com/global/eng/pages/offerings/industries/chemic	comply with EU Directive 2). d via internal design contro chemical substance is NOT document, there is no cred any regulatory scheme worl flammability standard for p cals/plastics/	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohis, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide.	, to the best of ntration of the to obtain a test	Microchip Te chemical subs	chnology stance, if		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a oldling compounds used by Microchip meet the UL94 V0 tp://ul.com/global/eng/pages/offerings/industries/chemic he protective "tubes" in which the specific product is shertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the informatieir original packing materials is true and correct to the I ompleteness and accuracy of data in this form because information is often protected from disclosure as trade se	comply with EU Directive 2). d via internal design contro chemical substance is NOT document, there is no cred iny regulatory scheme worl flammability standard for p cals/plastics/ ipped are made from polyvi on in this form concerning the standard set the seen compiled based to the seen compiled based crets and some information se parts and the average w	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics of the lastics. You can access the UL iQTM family of databases the lastics of the lastics. "Window envelopes" used to held the lastics of the lastics	i, to the best of ntration of the co obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materi	Microchip Te chemical subs report at slip on the or semiconducto d cannot guari naterial suppliers. I	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight 100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ny, is not below the threshold of regulatory concern for a olding compounds used by Microchip meet the UL94 VO ttp://ul.com/global/eng/pages/offerings/industries/chemiche protective "tubes" in which the specific product is shertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the informative original packing materials is true and correct to the I ompleteness and accuracy of data in this form because information is often protected from disclosure as trade se provided only as estimates of the average weight of the vels of dopants, metals, and non-metal materials contain icrochip Technology Incorporated does not provide any	comply with EU Directive 2). d via internal design contro chemical substance is NOT document, there is no cred iny regulatory scheme worl flammability standard for p cals/plastics/ ipped are made from polyvi on in this form concerning the standard for the service of its knowledge and be that been compiled based crets and some information se parts and the average we ned within silicon devices (s warranty, express or implie	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics of the lastics. You can access the UL iQTM family of databases the lastics of the lastics. "Window envelopes" used to held the lastics of the lastics	I, to the best of ntration of the coordinates obtain a test old the packing neorporated's agy Incorporated by raw materi'hese estimates tion. The exclusion of the coordinates of the co	Microchip Te chemical subs report at slip on the or semiconducto d cannot guar- naterial suppli al suppliers. I s do not inclu-	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100	0.34
irrective 2002/53/EC (End-of-Life Vehicles (ELV) Directive ompliance with the above EU Directives has been verifie a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this y, is not below the threshold of regulatory concern for a olding compounds used by Microchip meet the UL94 V0 tp://ul.com/global/eng/pages/offerings/industries/chemic perotective "tubes" in which the specific product is shertain "reels" may be made from PVC plastic. icrochip Technology Incorporated believes the informatieir original packing materials is true and correct to the termination is often protected from disclosure as trade se provided only as estimates of the average weight of the vels of dopants, metals, and non-metal materials contain icrochip Technology Incorporated does not provide any arranties provided by Microchip Technology Incorporate arranties provided by Microchip Technology Incorporate icrochip disclaims any duty to notify users of updates o	comply with EU Directive 2 d via internal design contro chemical substance is NOT document, there is no cred any regulatory scheme worl flammability standard for p cals/plastics/ ipped are made from polyvi on in this form concerning nest of its knowledge and be t has been compiled based crets and some information se parts and the average w ned within silicon devices (s warranty, express or implied and its subsidiaries are c or changes to Material Conte the users' reliance on the i	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity concedivide. lastics. You can access the UL iQTM family of databases the lastics. You can access the UL iQTM family of databases the lastics of the lastics. William of the lastics of th	i, to the best of ntration of the coordinates of th	Microchip Te chemical subs report at slip on the or semiconducto d cannot guar- naterial suppliers. I s do not inclu- sive, limited p e provided in N	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct Microchip's	1.84	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed #150°C for	% of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	0.34

PT 64 TQFP 11:15 AM: 8/29/2013

ИICROCHIP				nation Base A	•		•	nogeneous Materials: e.g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: PT 80 (Lead)	, ,								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	292.63	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	254.322	693,542		Silica, vitreous	60676-86-0	86.91	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	6.121	22.444	61,207		Epoxy Resin	Trade Secret	7.67	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.078	14.953	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.907	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.000	36.671	100,003			Total	100.00	
Nickel	7440-02-0	Lead Frame	0.267	0.978	2,667	38.50	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0.175	0.643	1,752		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.047	0.173	473		Nickel	7440-02-0	2.54	
Magnesium	7439-95-4	Lead Frame	0.011	0.039	105		Silver	7440-22-4	1.67	
Silver (Ag)	7440-22-4	Die Attach	0.600	2.200	6,000		Silicon	7440-21-3	0.45	
Acrylate Urethane Oligomer	General	Die Attach	0.150	0.550	1,500		Magnesium	7439-95-4	0.10	
Silicon	7440-21-3	Chip (Die)	7.500	27.503	75,000			Total	100.00	
Gold	7440-57-5	Wire Bond	0.200	0.733	2,000	2.75	(mg) Total	Die Attach	% of Total Weight	0.75
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	4.584	12,500		Silver (Ag)	7440-22-4	80	
		TOTALS:	100.000	366.700	1,000,000	A	crylate Urethane Oligomer		20	
	0.3667	g Total Mass						Total	100.00	
	with EU Directive 2	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	IS Recast Direc	ctive) and with	n EU	27.50	Total (mg)	Chip (Die)	% of Total Weight	7.5
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via interpretation.	ernal design contro	Is, supplier declarations, and /or analytical test data.		,		27.50	Total (mg) Doped Silicon	7440-21-3	100	7.5
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via intechemical substance is absent from the list above, the chemica proprated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flammat	ernal design contro I substance is NOT nt, there is no credi latory scheme work bility standard for p	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide.	I, to the best of ntration of the o	Microchip Te	chnology	0.73	,	,		
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical proprated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flammato://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped and	ernal design contro I substance is NOT nt, there is no credi latory scheme work bility standard for p tics/	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases to the control of the c	I, to the best of ntration of the o	Microchip Te chemical subs	chnology stance, if		Doped Silicon	7440-21-3 Total	100	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume r, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flammato://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped and in "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information in this ir original packing materials is true and correct to the best of its mpleteness and accuracy of data in this form because it has beometimes in soften protected from disclosure as trade secrets and records.	ernal design contro I substance is NOT nt, there is no credi latory scheme work bility standard for p tics/ e made from polyvi s form concerning: s knowledge and be en compiled based d some information	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ble reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic the lastic that it is substances restricted by RoHS in Microchip Technology In the last of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets provided by subcontract assemblers in may not have been provided by subcontract assemblers.	I, to the best of ntration of the o to obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materi	Microchip Te chemical substreport at slip on the or semiconducto d cannot guar laterial suppliers. I	chnology stance, if uter box and r devices in antee the ers. Supplier nformation		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interaction of the date of this docume by is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat pr://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped antain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in this provided any accuracy of data in this form because it has beormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts tels of dopants, metals, and non-metal materials contained with crochip Technology Incorporated does not provide any warranty matters provided by Microchip Technology Incorporated and its otations, sales order acknowledgement, and invoices.	ernal design contro I substance is NOT nt, there is no credi latory scheme work bility standard for p tics/ e made from polyvi s form concerning: s knowledge and be en compiled based d some information and the average w in silicon devices (s y, express or implie s subsidiaries are co	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases of the inverse of the	I, to the best of ntration of the coordinates to obtain a test old the packing ncorporated's segy incorporated by raw mand raw materi These estimates tion. The exclusiale. These are	Microchip Te chemical substance report at slip on the or semiconducto d cannot guar laterial suppli al suppliers. I s do not inclusive, limited p p provided in I	chnology stance, if uter box and ir devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.2
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interaction of the date of this docume to comporated's knowledge and belief as of the date of this docume ty, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammat pr://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped antain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in this provided any activation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts lets of dopants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any warranty matters provided by Microchip Technology Incorporated and its provided by Microchip Technology Incorporated Active Technology Incorporated Active Technology In	ernal design contro I substance is NOT nt, there is no credi latory scheme work collity standard for p tics/ e made from polyvi s form concerning is s knowledge and be en compiled based d some information and the average w in silicon devices (s y, express or implie s subsidiaries are constants.	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases to a substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substance of the substance of the substance in the substance of	I, to the best of ntration of the of to obtain a test old the packing ncorporated's significant and raw materi These estimates tion. The exclusion. The sale. These are irect or indirect or indirect or indirect or indirect	Microchip Te chemical substance and semiconducto de cannot guaraterial supplial suppliers. It is do not inclusive, limited per provided in It is, consequential, subsequential, consequential, consequential substance and suppliers. It is do not inclusive, limited per provided in It is consequential substance and substance an	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace	0.73	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 7440-31-5	100 100.00 % of Total Weight 100 100.00 % of Total Weight 100.00	0.2
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interaction of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal p://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped arratin "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in this irroriginal packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has beormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts rels of dopants, metals, and non-metal materials contained within crochip Technology Incorporated does not provide any warranty rranties provided by Microchip Technology Incorporated and its otations, sales order acknowledgement, and invoices. Crochip disclaims any duty to notify users of updates or change rerwise, suffered by users or third parties as a result of the user	ernal design contro I substance is NOT nt, there is no credi latory scheme work collity standard for p tics/ e made from polyvi s form concerning is s knowledge and be en compiled based d some information and the average w in silicon devices (s y, express or implie s subsidiaries are constants.	Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases to a substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substances restricted by RoHS in Microchip Technology In the substance of the substance of the substance in the substance of	I, to the best of ntration of the of to obtain a test old the packing ncorporated's significant and raw materi These estimates tion. The exclusion. The sale. These are irect or indirect or indirect or indirect or indirect	Microchip Te chemical substance and semiconducto de cannot guaraterial supplial suppliers. It is do not inclusive, limited per provided in It is, consequential, subsequential, consequential, consequential substance and suppliers. It is do not inclusive, limited per provided in It is consequential substance and substance an	chnology stance, if uter box and or devices in antee the ers. Supplier information de trace	0.73	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.2

PT 80 TQFP 11:15 AM : 8/29/2013

Basic Substance CAS Number Sub-Component Silica, vitreous (or fused) 60676-86-0 Mold Compound Epoxy Resin Trade Secret Mold Compound	% Total							Labeling e3
Silica, vitreous (or fused) 60676-86-0 Mold Compound Epoxy Resin Trade Secret Mold Compound				306.01	(mg) Total	Mold Compound	% ot Total Weight	t 57.52
Epoxy Resin Trade Secret Mold Compound	Weight 48.892	mg/part 260.105	ppm 488.920		Silica, vitreous (or fused)	60676-86-0	85.00	╗———
	5.004	26.623	50.042		Epoxy Resin	Trade Secret	85.00	-
Phenolic Resin Trade Secret Mold Compound	3.451	18.360	34.512		Phenolic Resin	Trade Secret	6.00	-
Carbon Black 1333-86-4 Mold Compound	0.173	0.918	1.726		Carbon Black	1333-86-4	0.30	1
Copper 7440-50-8 Leaf Frame	31.426	167.187	314.261		Odibon Black	Total	100.00) 실
Tin 7440-31-5 Lead Frame	0.081	0.429	807	171.62	(mg) Total	Lead Frame	% of Total Weight	
Silver 7440-22-4 Lead Frame	0.615	3.269	6.146	171.02		7440-50-8	97.42	1 32.20
Zinc 7440-66-6 Lead Frame	0.615	0.309	581		Copper Tin	7440-50-8 7440-31-5	0.25	1
Zinc 7440-66-6 Lead Frame Chromium 7440-47-3 Lead Frame	0.058	0.309	581 807		I in Silver	7440-31-5 7440-22-4	0.25 1.91	4
Chromium 7440-24-7-3 Lead Flame Silver (Ad) 7440-22-4 Die Atlach	0.830	4.416	8.300		Zinc	7440-22-4	0.18	1
ANHYDRIDE Trade Secret Die Attach	0.830	0.479	900		Zinc Chromium	7440-66-6 7440-47-3	0.18	1
EPOXY RESIN Trade Secret Die Attach	0.090	0.479	800		CHIOIIIIIIII	7440-47-3 Total	100.00	'A
	7.650	40.698						
Silicon 7440-21-3 Chip (Die)			76,500	5.32	(mg) Total	Die Attach	% of Total Weight	<u>t 1</u>
Gold 7440-57-5 Wire Bond	0.370	1.968	3,700		Silver (Ag)	7440-22-4	83	
Tin 7440-31-5 Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.200	6.384	12,000		ANHYDRIDE	Trade Secret	9	
TOTALS:	100.000	532.000	1,000,000		EPOXY RESIN	Trade Secret	8	<u></u>
0.5320 g Total Mass						Total	100.00	1
(End-of-Life Vehicles (ELV) Directive). above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data. ce is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to edge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentre threshold of regulatory concern for any regulatory scheme world-wide.					Doped Silicon	7440-21-3 Total	100	
used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to o ng/pages/offerings/industries/chemicals/plastics/	obtain a test	report at		1.97	(mg) Total	Wire Bond	% of Total Weight	t 0.37
" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold e made from PVC plastic.	I the packing	slip on the ou	ter box and		Doped Gold	7440-57-5	100	
y incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Inco materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology I curacy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets providoreted from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and stimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. The tals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.	Incorporated ded by raw materia	cannot guara aterial supplie al suppliers. Ir	intee the ers. Supplier information			Total	100.00	-
y incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale				6.38		Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight	t 1.2
er acknowledgement, and invoices.			.,					1
er acknowledgement, and invoices. Inny duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direc y users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or indepen Compliance for semiconductor products.					Tin	7440-31-5 Total	100.00	

PF 80 TQFP 11:16 AM : 8/29/2013

MICROCHIP				ation Base A	,		•	nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: PF 100 (Lea	d) TQFP 12x12x1mm (V7)								e3
•	,	"Contained In"	% Total		ſ					
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	312.02	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	271.175	693,542		Silica, vitreous	60676-86-0	86.91	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	6.121	23.932	61,207		Epoxy Resin	Trade Secret	7.67	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.078	15.944	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.967	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.000	39.101	100.003		ourbon Black	Total	100.00	
Nickel	7440-02-0	Lead Frame	0.267	1.043	2,667	41.06	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-02-0	Lead Frame	0.207	0.685	1.752	41.00		7440-50-8	95,24	10.5
Silicon	7440-22-4	Lead Frame	0.175	0.685	473		Copper Nickel	7440-50-8 7440-02-0	95.24 2.54	
Magnesium	7440-21-3	Lead Frame	0.047	0.185	105		Nickei Silver	7440-02-0	2.54 1.67	
Silver (Ag)	7440-22-4	Die Attach	0.600	2.346	6.000		Silicon	7440-22-4	0.45	
Acrylate Urethane Oligomer	General	Die Attach	0.150	0.587	1,500		Magnesium	7439-95-4	0.45	
Silicon	7440-21-3		7.500	29.325	75.000		iviagnesium	7439-93-4 Total	100.00	
		Chip (Die)								
Gold	7440-57-5	Wire Bond	0.200	0.782	2,000	2.93	(mg) Total	Die Attach	% of Total Weight	0.75
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	4.888	12,500		Silver (Ag)	7440-22-4	80	
		TOTALS:	100.000	391.000	1,000,000	A	crylate Urethane Oligomer		20	
	0.3910	g Total Mass	100.000	391.000	1,000,000	A	crylate Urethane Oligomer	General Total	20 100.00	
		g Total Mass			,,	29.33	crylate Urethane Oligomer Total (mg)			7.5
is semiconductor device and its homogenous materials comply rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via integration.	with EU Directive 2	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol			,,			Total	100.00	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 2 ernal design contro Il substance is NOT ent, there is no credi	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conce	HS Recast Direct	ctive) and with	EU		Total (mg)	Total Chip (Die)	100.00 % of Total Weight	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interest a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume	with EU Directive 2 ernal design contro il substance is NOT ent, there is no credi latory scheme work bility standard for p	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide.	IS Recast Directly to the best of ntration of the	ctive) and with Microchip Techemical subs	EU		Total (mg)	Total Chip (Die) 7440-21-3	% of Total Weight	7.5
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma	ernal design contro ernal design contro il substance is NOT int, there is no credi latory scheme work bility standard for p	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases	IS Recast Direct	ctive) and with Microchip Tec chemical subs	EU chnology tance, if	29.33	Total (mg) Doped Silicon	Total Chip (Die) 7440-21-3 Total	100.00 % of Total Weight 100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via int a chemical substance is absent from the list above, the chemica orporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regu liding compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plas e protective "tubes" in which the specific product is shipped ar tain "reels" may be made from PVC plastic.	ernal design contro il substance is NOT int, there is no credi latory scheme work bility standard for p tics/ e made from polyvi	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. lastics. You can access the UL iQTM family of databases in the control of the contr	Is Recast Direct I, to the best of Intration of the coordinates Is obtain a test Is old the packing	Microchip Techemical substreport at	EU Chnology tance, if	29.33	Total (mg) Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into the chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped artain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the information in this crochip Technology Incorporated does not provide any warrant rranties provided by Microchip Technology Incorporated and its provided by Microchip Technology Incorporated believes the Information Incorporated and Its provided by Microchip Technology Incorporated By Microchip Technology Incorporated	ernal design contro al substance is NOT int, there is no credi latory scheme work bility standard for p ttics/ e made from polyvi is form concerning; y, express or implie	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases in nyl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I nd, with respect to the information provided in this declara	Is Recast Direct I, to the best of intration of the ico obtain a test old the packing incorporated's s tion. The exclusion	Microchip Techemical substreport at slip on the outering side of the conductors of t	EU chnology stance, if	29.33	Total (mg) Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	100.00 % of Total Weight 100 100.00 % of Total Weight 100	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via into the chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped ar	ernal design contro al substance is NOT int, there is no credi latory scheme work bility standard for p tics/ e made from polyvi is form concerning: y, express or implie s subsidiaries are c	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases in myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I id, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	Is Recast Direct I, to the best of Intration of the Ito obtain a test Is o	Microchip Techemical substreport at slip on the outericonductor sive, limited provided in Management.	EU chnology tance, if ater box and r devices in roduct flicrochip's	0.78	Total (mg) Doped Silicon (mg) Total Doped Gold	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin /annealed at 150°C for	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00	0.2
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via int chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma ob/lul.com/global/eng/pages/offerings/industries/chemicals/plass or protective "tubes" in which the specific product is shipped at tain "reels" may be made from PVC plastic. prochip Technology Incorporated believes the information in this rochip Technology Incorporated does not provide any warrant reanties provided by Microchip Technology Incorporated and it stations, sales order acknowledgement, and invoices.	ernal design contro al substance is NOT int, there is no credi latory scheme work bility standard for p tics/ e made from polyvi is form concerning: y, express or implie s subsidiaries are c	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rol Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conce d-wide. lastics. You can access the UL iQTM family of databases in myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology I id, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of	Is Recast Direct I, to the best of Intration of the Ito obtain a test Is o	Microchip Techemical substreport at slip on the outericonductor sive, limited provided in Management.	EU chnology tance, if ater box and r devices in roduct flicrochip's	0.78	Total (mg) Doped Silicon (mg) Total Doped Gold (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100.00 % of Total Weight 100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.2

PF 100 TQFP 11:16 AM : 8/29/2013

MICROCHIP Semiconductor Devic	ce Type: PF 100 (Lead) TQI	ED And Arm (FF (VF (FG))		nation Base A pper Alloy (C				geneous Materials: g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Devic	e Type. PF 100 (Lead) TQI	"Contained In"	% Total	1						es
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	339.65	(mg) Total	Mold Compound	% ot Total Weight	68.34
Silica, vitreous (or fused)	60676-86-0	Mold Compound	58.089	288.702	580,890		Silica, vitreous (or fused)	60676-86-0	85.00	1
Epoxy Resin	Trade Secret	Mold Compound	5.946	29.550	59,456		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.100	29.550	41.004		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.205	1.019	2.050		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	26.156	129.995	261.559		Calboll Black	Total	0.00	<u>ll</u>
Tin	7440-31-5	Lead Frame	0.067	0.334	671	133.44	(mg) Total	Lead Frame	% of Total Weight	26.85
Silver	7440-22-4	Lead Frame	0.511	2.542	5.115		Copper	7440-50-8	97.42	
Zinc	7440-66-6	Lead Frame	0.048	0.240	483		Tin	7440-50-8	0.25	
Chromium	7440-66-6	Lead Frame	0.048	0.334	671		Silver	7440-31-5	1.91	
Silver (Ag)	7440-47-3	Die Attach	0.481	2.393	4,814		Zinc	7440-22-4	0.18	
ANHYDRIDE		Die Attach	0.461	0.259				7440-66-6	0.18	
	Trade Secret				522		Chromium			<u>!</u>
EPOXY RESIN	Trade Secret	Die Attach	0.046	0.231	464			Total		
Silicon	7440-21-3	Chip (Die)	2.710	13.469	27,100	2.88	(mg) Total	Die Attach	% of Total Weight	0.58
Gold	7440-57-5	Wire Bond	0.420	2.087	4,200		Silver (Ag)	7440-22-4	83	
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.100	5.467	11,000		ANHYDRIDE	Trade Secret	9	
		TOTALS:	100.000	497.000	1,000,000		EPOXY RESIN	Trade Secret	8	
	0.4970 a To	stal Mace					·	Total	100.00	
This semiconductor device and its homogenous materials	comply with EU Directive 2002/95		IS Recast Dire	ctive) and with	ı EU	13 47	Total (mg)	Chin (Die)	% of Total Weigh	2.71
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified	s comply with EU Directive 2002/95). d via internal design controls, sup	/EC (RoHS Directive), EU Directive 2011/65/EU (RoH plier declarations, and /or analytical test data.		·		13.47	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive)	comply with EU Directive 2002/95). d via internal design controls, sup chemical substance is NOT an inte document, there is no credible rea	/EC (RoHS Directive), EU Directive 2011/65/EU (RoH plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer	, to the best of	Microchip Ted	chnology	13.47	,	,	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the ncorporated's knowledge and belief as of the date of this	comply with EU Directive 2002/95). d via internal design controls, sup chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide. flammability standard for plastics.	VEC (RoHS Directive), EU Directive 2011/65/EU (RoH plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ason to believe that the unavoidable impurity concer	, to the best of ntration of the	Microchip Tec	chnology	2.09	,	7440-21-3	100	
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verifier of a chemical substance is absent from the list above, the oncorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 VO	comply with EU Directive 2002/95). d via internal design controls, sup- chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide. flammability standard for plastics. cals/plastics/	VEC (RoHS Directive), EU Directive 2011/65/EU (RoHs plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concers. You can access the UL iQTM family of databases to the content of t	, to the best of ntration of the o obtain a test	Microchip Tec chemical subs	chnology stance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.42
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified for a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informative heir original packing materials is true and correct to the brompleteness and accuracy of data in this form because information is often protected from disclosure as trade sets provided only as estimates of the average weight of the evels of dopants, metals, and non-metal materials contain	s comply with EU Directive 2002/95). d via internal design controls, sup- chemical substance is NOT an inte document, there is no credible rea any regulatory scheme world-wide. flammability standard for plastics. cals/plastics/ ipped are made from polyvinyl chle ion in this form concerning substanest of its knowledge and belief, as it has been compiled based on the crets and some information may n ise parts and the average weight of ned within silicon devices (silicon I	WEC (RoHS Directive), EU Directive 2011/65/EU (RoHs Directive), EU Directive 2011/65/EU (RoHs plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity concert. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to have been concert in the form. Microchip Technology In so fithe date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the fact of the date listed in this form. Microchip Technology In the finished parts.	, to the best of ntration of the o obtain a test old the packing ncorporated's a gy Incorporate vided by raw n and raw materi hese estimate	Microchip Techemical substreport at slip on the outside a simple of a cannot guaraterial suppliers. It is do not include side on the control of the cannot guaraterial suppliers. It is do not include side of the cannot guaraterial suppliers. It is do not include side of the cannot guaraterial suppliers. It is do not include side of the cannot guaraterial suppliers.	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total	100 100.00 % of Total Weight	0.42
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shibertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in the protected from disclosure as trade sets provided only as estimates of the average weight of the evels of dopants, metals, and non-metal materials contain Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate quotations, sales order acknowledgement, and invoices.	s comply with EU Directive 2002/95). d via internal design controls, sup- chemical substance is NOT an inte- document, there is no credible rea any regulatory scheme world-wide. flammability standard for plastics. cals/plastics/ iipped are made from polyvinyl chlo- tion in this form concerning substan- cest of its knowledge and belief, as- it has been compiled based on the crets and some information may n use parts and the average weight of ned within silicon devices (silicon I warranty, express or implied, with- ed and its subsidiaries are contained	VEC (RoHS Directive), EU Directive 2011/65/EU (RoHs plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity concers. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to he oride (PVC) plastic. "Window envelopes" used to he original to the date listed in this form. Microchip Technology In a first of the date listed in this form. Microchip Technology aranges provided in Material Safety Data Sheets provide have been provided by subcontract assemblers at anticipated significant toxic metals components. T (C) in the finished parts. It respect to the information provided in this declarated in Microchip's standard terms and conditions of sections.	, to the best of ntration of the o obtain a test old the packing neorporated's a y Incorporate vided by raw nand raw materihese estimate cion. The exclusale. These are	Microchip Techemical substreport at slip on the outsemiconductor deannot guaraterial suppliers. It is do not include sive, limited per provided in Merchemical suppliers in the period of the sive, limited per provided in Merchemical substraints.	chnology stance, if uter box and r devices in antee the ers. Supplier nformation de trace roduct Microchip's		Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	. 0.42
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the office of the comportance of the date of this suny, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 Vo intry/lul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shipper the compound of the product is shipper of the protective "tubes" in which the specific product is shipper original packing materials is true and correct to the becompleteness and accuracy of data in this form because information is often protected from disclosure as trade see information is often protected from disclosure from disclosure (information is often protected from disclosure (information is often protected from disclosure (informatio	comply with EU Directive 2002/95). d via internal design controls, sup- chemical substance is NOT an inte- document, there is no credible rea any regulatory scheme world-wide. flammability standard for plastics. cals/plastics/ ipped are made from polyvinyl chlor ion in this form concerning substan- cest of its knowledge and belief, as it has been compiled based on the icrets and some information may in use parts and the average weight of ned within silicon devices (silicon I warranty, express or implied, with ad and its subsidiaries are contained in changes to Material Content Decl the users' reliance on the informa	WEC (RoHS Directive), EU Directive 2011/65/EU (RoHs Directive), EU Directive 2011/65/EU (RoHs plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ison to believe that the unavoidable impurity concer. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to he nees restricted by RoHS in Microchip Technology In so of the date listed in this form. Microchip Technology In so the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology In the date of anticipated significant toxic metals components. To it is interested to the information provided in this declarated in Microchip's standard terms and conditions of starations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations and shall not be liable for any damages, diarations.	to the best of ntration of the o obtain a test old the packing accorporated's gy Incorporate vided by raw n and raw materihese estimate these are to rindirect or indirect or indirect	Microchip Techemical substreport at slip on the outsemiconductor d cannot guaraterial suppliers. It is do not included by the provided in Marcochemical suppliers. It is do not included by the provided in Marcochemical substreport in Marcochemical substrates and subst	chnology stance, if uter box and r devices in antee the ers. Supplier information de trace roduct Microchip's	2.09	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 % of Total Weight 100.00 % of Total Weight	. 0.42

PF 100 TQFP 11:16 AM : 8/29/2013

МICROCHIP				nination Base copper Alloy (nogeneous Materials: e.g. pc boards, displa	ys)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device	ce Type: PH 144 (Lead)	TQFP 16x16x1mm (R9)								e3
		"Contained In"	% Total			467.72	(mg) Total	Mold Compound	% ot Total Weight	68.23
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	407.72				00.20
Silica, vitreous (or fused)	60676-86-0	Mold Compound	57.996	397.559	579,955	l	Silica, vitreous (or fused)	60676-86-0	85.0000	
Epoxy Resin	Trade Secret	Mold Compound	5.936	40.691	59,360		Epoxy Resin	Trade Secret	8.7000	
Phenolic Resin Carbon Black	Trade Secret 1333-86-4	Mold Compound Mold Compound	4.094 0.205	28.063 1.403	40,938 2,047		Phenolic Resin Carbon Black	Trade Secret 1333-86-4	6.0000 0.3000	
Copper	7440-50-8	Lead Frame	26.955	184.775	269,547	l	Calbuil Black	Total	100.00	J
Tin	7440-31-5	Lead Frame	0.069	0.474	692	189.68	(mg) Total	Lead Frame	% of Total Weight	27.67
Silver	7440-31-3	Lead Frame	0.527	3.613	5.271	189.68	Copper	7440-50-8	97.42	27.07
Zinc	7440-66-6	Lead Frame	0.050	0.341	498	l	Tin	7440-31-5	0.25	
Chromium	7440-47-3	Lead Frame	0.069	0.474	692	ł	Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.423	2.902	4.233	i	Zinc	7440-66-6	0.18	
ANHYDRIDE	Trade Secret	Die Attach	0.046	0.315	459	i	Chromium	7440-47-3	0.25	
EPOXY RESIN	Trade Secret	Die Attach	0.041	0.280	408	1		Total	100.00	J
Silicon	7440-21-3	Chip (Die)	2.090	14.327	20.900	3.50	(mg) Total	Die Attach	% of Total Weight	0.51
Doped Gold	7440-57-5	Wire Bond	0.280	1.919	2.800		Silver (Ag)	7440-22-4	83.00	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.220	8.363	12,200	1	ANHYDRIDE	Trade Secret	9.00	
		TOTALS:	100.000	685.500	1,000,000	1	EPOXY RESIN	Trade Secret	8.00	
										1
is semiconductor device and its homogenous materials		Total Mass /95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and with	h EU Directive	14.33	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	2.09
is semiconductor device and its homogenous materials 02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified to chemical substance is absent from the list above, the c	comply with EU Directive 2002 d via internal design controls, s	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHi supplier declarations, and /or analytical test data.		•		14.33	(mg) Total Doped Silicon			2.09
D2/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this one that the control below the threshold of regulatory concern for any resolding compounds used by Microchip meet the UL94 Vo	comply with EU Directive 2002, d via internal design controls, s chemical substance is NOT an i document, there is no credible gulatory scheme world-wide. flammability standard for plasti	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen	to the best o tration of the	f Microchip Te chemical sub	echnology		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
02/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any results.	comply with EU Directive 2002, d via internal design controls, s chemical substance is NOT an i document, there is no credible gulatory scheme world-wide. flammability standard for plasti als/plastics/	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: upplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen ics. You can access the UL iQTM family of databases to	to the best o tration of the o obtain a tes	f Microchip Te chemical sub t report at	echnology stance, if any,	1.92	Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
02/53/EC (End-of-Life Vehicles (ELV) Directive). impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this ont below the threshold of regulatory concern for any republing compounds used by Microchip meet the UL94 V0 ip://ul.com/global/eng/pages/offerings/industries/chemic	comply with EU Directive 2002, d via internal design controls, s chemical substance is NOT an i document, there is no credible gulatory scheme world-wide. flammability standard for plasti als/plastics/	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: upplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen ics. You can access the UL iQTM family of databases to	to the best o tration of the o obtain a tes	f Microchip Te chemical sub t report at	echnology stance, if any,		Doped Silicon	Chip (Die) 7440-21-3 Total	% of Total Weight 100 100.00	
no 2/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any ending compounds used by Microchip meet the UL94 Volp/lul.com/global/eng/pages/offerings/industries/chemice protective "tubes" in which the specific product is ship	comply with EU Directive 2002. d via internal design controls, s chemical substance is NOT an i document, there is no credible regulatory scheme world-wide. flammability standard for plasti als/plastics/ pped are made from polyvinyl of on in this form concerning subsets of its knowledge and belief, thas been compiled based on t crets and some information may parts and the average weight o	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: upplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen ics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to ho stances restricted by RoHS in Microchip Technology In , as of the date listed in this form. Microchip Technolog he ranges provided in Material Safety Data Sheets prov y not have been provided by subcontract assemblers a f anticipated significant toxic metals components. The	to the best of tration of the obtain a tes obtain a tes of the packin corporated's y Incorporate dided by raw ind raw mater	f Microchip Te chemical sub t report at g slip on the o semiconducto d cannot guar material suppli ial suppliers.	echnology stance, if any, uter box and or devices in rantee the iers. Supplier Information is		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond	% of Total Weight 100 100.00 % of Total Weight	
naple 2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this report of the compounds used by Microchip meet the UL94 V0 is p://ul.com/global/eng/pages/offerings/industries/chemic e protective "tubes" in which the specific product is ship train "reels" may be made from PVC plastic. Corochip Technology Incorporated believes the informatic in original packing materials is true and correct to the bimpleteness and accuracy of data in this form because it ormation is often protected from disclosure as trade seconded only as estimates of the average weight of these	comply with EU Directive 2002. If via internal design controls, so themical substance is NOT an indicate of the gulatory scheme world-wide. If ammability standard for plasticals/plastics/ pped are made from polyvinyl of the properties of the knowledge and belief, in a been compiled based on the crets and some information may parts and the average weight ohin silicon devices (silicon IC) in warranty, express or implied, warranty.	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concentics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hostances restricted by RoHS in Microchip Technology In, as of the date listed in this form. Microchip Technology in ranges provided in Material Safety Data Sheets prov y not have been provided by subcontract assemblers a of anticipated significant toxic metals components. Then the finished parts.	to the best of tration of the or obtain a test of the packin corporated's y Incorporate inded by raw ind raw maters e estimates	f Microchip Te chemical sub treport at g slip on the o semiconductod cannot guar material supplical suppliers. Ido not include usive, limited pusive, limited	echnology stance, if any, uter box and or devices in rantee the iers. Supplier Information is a trace levels		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	
napliance with the above EU Directive). Impliance with the above EU Directives has been verified a chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this toroprotated's knowledge and belief as of the date of this toroprotated's knowledge and belief as of the date of this toroprotated's knowledge and belief as of the date of this toroprotated's knowledge and belief as of the date of this toroprotated belief as of the date of this provided in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the specific product is shipper to the specific product in the sp	comply with EU Directive 2002. d via internal design controls, s chemical substance is NOT an i document, there is no credible gulatory scheme world-wide. flammability standard for plasti als/plastics/ pped are made from polyvinyl of on in this form concerning sub- est of its knowledge and belief, i has been compiled based on to crets and some information may parts and the average weight o hin silicon devices (silicon IC) in warranty, express or implied, w d and its subsidiaries are conta changes to Material Content D the users' reliance on the infor	/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH: upplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and, reason to believe that the unavoidable impurity concen- ics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to ho stances restricted by RoHS in Microchip Technology In- in, as of the date listed in this form. Microchip Technolog he ranges provided in Material Safety Data Sheets prov y not have been provided by subcontract assemblers a if anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declarati- title din Microchip's standard terms and conditions of s eclarations and shall not be liable for any damages, dir	to the best of tration of the or obtain a test of the packin corporated's y Incorporate ided by raw mater are estimates on. The exclusion. The exclusion are incorporated and the packing are stimates or on the exclusion of the exclusion.	f Microchip Te chemical sub treport at g slip on the o semiconductor d cannot guarnaterial suppliers. do not include usive, limited pe provided in the consequent t, consequent	echnology stance, if any, uter box and or devices in rantee the iers. Supplier Information is trace levels oroduct Microchip's	1.92	Doped Silicon (mg) Total Doped Gold	Chip (Die) 7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin /annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.28

PH 144 TQFP 11:16 AM: 8/29/2013

MICROCHIP	CT 00	T000D		nation Base A opper Alloy (C				ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Typ	e: 51 U8 (Lead)									e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	19.49	(mg) Total	Mold Compound	% ot Total Weight	59.06
Silica, vitreous	60676-86-0	Mold Compound	50.201	16,566	502.010		Silica, vitreous	60676-86-0	85.00	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	3.617	1,194	36,174		Epoxy Resin	Trade Secret	6.13	
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	3.617	1.194	36,174		Phenolic Resin	Trade Secret	6.13	1
Epoxy, Cresol Novolac	29690-82-2	Mold Compound	1.447	0.478	14,470		Epoxy, Cresol Novolac	29690-82-2	2.45	1
Carbon Black	1333-86-4	Mold Compound	0.177	0.058	1,772		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	30.020	9.907	300,200			Total	100.00	Ī
Nickel	7440-02-0	Lead Frame	0.801	0.264	8,006	10.40	(mg) Total	Lead Frame	% of Total Weight	31.52
Silver	7440-22-4	Lead Frame	0.526	0.174	5,261		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.142	0.047	1,418		Nickel	7440-02-0	2.54	1
Magnesium	7439-95-4	Lead Frame	0.032	0.010	315		Silver	7440-22-4	1.67	1
Silver	7440-22-4	Die Attach	0.840	0.277	8,400		Silicon	7440-21-3	0.45	1
Diester Resin	94-80-4	Die Attach	0.168	0.055	1,680		Magnesium	7439-95-4	0.10	
Functionalized Urethane Resin	72869-86-4	Die Attach	0.056	0.018	560			Total	100.00	<u> </u>
Epoxy Resin	9003-36-5	Die Attach	0.028	0.009	280	0.37	(mg) Total	Die Attach	% of Total Weight	1.12
Epoxy Resin	13561-08-5	Die Attach	0.028	0.009	280		Silver	7440-22-4	75	
Silicon	7440-21-3	Chip (Die)	6.300	2.079	63.000		Diester Resin	94-80-4	15	1
Gold	7440-57-5	Wire Bond	0.180	0.059	1.800	Fun	ctionalized Urethane Resin	72869-86-4	5	1
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.820	0.601	18,200		Epoxy Resin	9003-36-5	3	
		TOTALS:	100.000	33.000	1,000,000		Epoxy Resin	13561-08-5	3	1
	0.0330	g Total Mass						Total	100.00	<u> </u>
his comiconductor dovice and its homogenous materials sample										
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Roh	dS Recast Dire	ctive) and with	EU	2.08	Total (mg)	Chip (Die)	% of Total Weight	6.3
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in	ternal design control	s, supplier declarations, and /or analytical test data.		ŕ		2.08	Total (mg) Doped Silcon	7440-21-3	100	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum ly, is not below the threshold of regulatory concern for any regi	ternal design controls al substance is NOT a ent, there is no credil alatory scheme world	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce-wide.	l, to the best of ntration of the	f Microchip Tec	chnology		Doped Silcon	7440-21-3 Total	100	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic corporated's knowledge and belief as of the date of this docum y, is not below the threshold of regulatory concern for any reg- olding compounds used by Microchip meet the UL94 V0 flamma tp://ul.com/global/eng/pages/offerings/industries/chemicals/pla	ternal design controls al substance is NOT a ent, there is no credit alatory scheme world ability standard for platics/	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to the content of the cont	l, to the best of ntration of the to obtain a test	f Microchip Tec chemical subs	chnology tance, if	0.06	,	7440-21-3	100	
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic icorporated's knowledge and belief as of the date of this documn, is not below the threshold of regulatory concern for any regulation compounds used by Microchip meet the UL94 V0 flammattp://ul.com/global/eng/pages/offerings/industries/chemicals/plate protective "tubes" in which the specific product is shipped a	ternal design controls al substance is NOT a ent, there is no credit alatory scheme world ability standard for platics/	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity conce-wide. astics. You can access the UL iQTM family of databases to the content of the cont	l, to the best of ntration of the to obtain a test	f Microchip Tec chemical subs	chnology tance, if		Doped Silcon	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.18
	ternal design controls al substance is NOT; ant, there is no credit allatory scheme world ability standard for pl. stics/ are made from polyvir is form concerning s as knowledge and be seen compiled based on ad some information and the average we	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to a concentration of the data listed in this form. Microchip Technolo on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers light of anticipated significant toxic metals components.	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate yided by raw n and raw mater	f Microchip Tec chemical subs t report at g slip on the ou semiconductor d cannot guara material suppliers. Ir	chnology tance, if ter box and devices in intee the ers. Supplier		Doped Silcon (mg) Total	7440-21-3 Total	100 100.00 % of Total Weight	0.18
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic icorporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any region ioding compounds used by Microchip meet the UL94 V0 flamme ttp://ul.com/global/eng/pages/offerings/industries/chemicals/pla he protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic. iicrochip Technology Incorporated believes the information in the ieir original packing materials is true and correct to the best of i ompleteness and accuracy of data in this form because it has be information is often protected from disclosure as trade secrets as provided only as estimates of the average weight of these part.	ternal design controls al substance is NOT; ant, there is no credit allatory scheme world ability standard for pl. stics/ are made from polyvir is form concerning s ats knowledge and be seen compiled based on all some information and some information and the average we ain silicon devices (si aty, express or implied	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to a concentration of the	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate vided by raw na and raw mater 'hese estimate	f Microchip Tec chemical subs t report at g slip on the ou semiconductor d cannot guara naterial suppliers. It is do not include usive, limited pr	chnology tance, if here box and devices in antee the ers. Supplier aformation le trace		Doped Silcon (mg) Total Doped Gold	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.18
irective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ompliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic icorporated's knowledge and belief as of the date of this docum ny, is not below the threshold of regulatory concern for any regrounding compounds used by Microchip meet the UL94 V0 flamms ttp://ul.com/global/eng/pages/offerings/industries/chemicals/pla he protective "tubes" in which the specific product is shipped a ertain "reels" may be made from PVC plastic. iicrochip Technology Incorporated believes the information in the ieir original packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets and iprovided only as estimates of the average weight of these part vels of dopants, metals, and non-metal materials contained with iicrochip Technology Incorporated does not provide any warran arranties provided by Microchip Technology Incorporated and in	ternal design controls al substance is NOT and there is no credit allatory scheme world ability standard for platics/ are made from polyvir as form concerning s as knowledge and be and some information and the average we ain silicon devices (si and the substitution of the substitution devices (si and subs	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to a concentration of the	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate wided by raw mand raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect or indirect or indirect.	f Microchip Tecchemical substance of the conductor of cannot guaranterial supplicial suppliers. In side on the conductor of t	chnology tance, if ter box and devices in intee the errs. Supplier information le trace	0.06	Doped Silcon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour 7440-31-5	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.18
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via in a chemical substance is absent from the list above, the chemic proprated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flamma p://ul.com/global/eng/pages/offerings/industries/chemicals/plae e protective "tubes" in which the specific product is shipped a rtain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in their original packing materials is true and correct to the best of impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets a provided only as estimates of the average weight of these particls of dopants, metals, and non-metal materials contained with crochip Technology Incorporated does not provide any warran irranties provided by Microchip Technology Incorporated and i otations, sales order acknowledgement, and invoices. Crochip disclaims any duty to notify users of updates or change nerwise, suffered by users or third parties as a result of the use	ternal design controls al substance is NOT and there is no credit allatory scheme world ability standard for platics/ are made from polyvir as form concerning s as knowledge and be and some information and the average we ain silicon devices (si and the substitution of the substitution devices (si and subs	s, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ole reason to believe that the unavoidable impurity concel-wide. astics. You can access the UL iQTM family of databases to a concentration of the	I, to the best of intration of the to obtain a test old the packing incorporated's gy Incorporate wided by raw mand raw mater These estimate tion. The exclusiale. These are irect or indirect or indirect or indirect or indirect.	f Microchip Tecchemical substance of the conductor of cannot guaranterial supplicial suppliers. In side on the conductor of t	chnology tance, if ter box and devices in intee the errs. Supplier information le trace	0.06	(mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.18

ST 8 TSSOP 11:16 AM : 8/29/2013

ICROCHIP Semiconductor Devi	ce Type: ST 14 (Lead) TSSO	P 4 4mm (04 / DH)		nation Base A pper Alloy (C				ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight			28.10	(mg) Total	Mold Compound	% ot Total Weight	46.84
Silica, vitreous (or fused)	60676-86-0	Mold Compound	39.814	mg/part 23.888	ppm 398,140		Silica, vitreous (or fused)	60676-86-0	85.00	Ī
Epoxy Resin	Trade Secret	Mold Compound Mold Compound	4.075	23.888	40.751		Epoxy Resin	Trade Secret	85.00	
Phenolic Resin	Trade Secret	Mold Compound	2.810	1.686	28.104		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.141	0.084	1,405		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	43.249	25.949	432,489			Total	100.00	<u>u</u>
Nickel	7440-02-0	Lead Frame	1.153	0.692	11,534	27.25	(mg) Total	Lead Frame	% of Total Weight	45.41
Silver	7440-22-4	Lead Frame	0.758	0.455	7,579		Copper	7440-50-8	95.24	
Silicon	7440-21-3	Lead Frame	0.204	0.123	2.043		Nickel	7440-02-0	2.54	
Magnesium	7439-95-4	Lead Frame	0.045	0.027	454		Silver	7440-22-4	1.67	
Silver	7440-22-4	Die Attach	1.214	0.728	12,136		Silicon	7440-21-3	0.45	
Epoxy resin	Trade Secret	Die Attach	0.328	0.197	3,280		Magnesium	7439-95-4	0.10	
Metal oxide	Trade Secret	Die Attach	0.049	0.030	492			Total	100.00	•
Gamma-butyrolactone	96-48-0	Die Attach	0.049	0.030	492	0.98	(mg) Total	Die Attach	% of Total Weight	1.64
Silicon	7440-21-3	Chip (Die)	3.340	2.004	33,400		Silver	7440-22-4	74	
Gold	7440-57-5	Wire Bond	0.490	0.294	4,900		Epoxy resin	Trade Secret	20	
Tin	7440-31-5 Plating or	n external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.280	1.368	22,800		Metal oxide	Trade Secret	3	
		TOTALS:	100.000	60.000	1,000,000		Gamma-butyrolactone	96-48-0	3	
	0.0600 a Tota	al Mass						Total	100.00	•
miconductor device and its homogenous materials	s comply with EU Directive 2002/95/E									
, , ,	•	, , , , , , , , , , , , , , , , , , , ,	15 Recast Direc	ctive) and with	EU	2.00	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	3.34
ance with the above EU Directives has been verified	ed via internal design controls, suppl	ier declarations, and /or analytical test data.		·	,	2.00		,		
ince with the above EU Directives has been verified incal substance is absent from the list above, the rated's knowledge and belief as of the date of this not below the threshold of regulatory concern for	ed via internal design controls, suppl chemical substance is NOT an inten document, there is no credible reas any regulatory scheme world-wide.	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concern.	l, to the best of ntration of the	Microchip Tec chemical subs	chnology		Doped Silicon	7440-21-3 Total	100	
ance with the above EU Directives has been verification with the above EU Directives has been verification. The list above, the prated's knowledge and belief as of the date of this not below the threshold of regulatory concern for a compounds used by Microchip meet the UL94 VC.com/global/eng/pages/offerings/industries/chemications.	ed via internal design controls, suppl chemical substance is NOT an inten document, there is no credible reas- any regulatory scheme world-wide. Of flammability standard for plastics. N cals/plastics/	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concervous can access the UL iQTM family of databases to	I, to the best of ntration of the	Microchip Tec chemical subs	chnology tance, if	0.29		7440-21-3	100	
liance with the above EU Directives has been verifice emical substance is absent from the list above, the torated's knowledge and belief as of the date of this into below the threshold of regulatory concern for ag compounds used by Microchip meet the UL94 VCul.com/global/eng/pages/offerings/industries/chemicotective "tubes" in which the specific product is should be substantially the substantial sub	ed via internal design controls, suppl chemical substance is NOT an inten document, there is no credible reas- any regulatory scheme world-wide. Of flammability standard for plastics. N cals/plastics/	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concervous can access the UL iQTM family of databases to	I, to the best of ntration of the	Microchip Tec chemical subs	chnology tance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.49
pliance with the above EU Directives has been verified nemical substance is absent from the list above, the porated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any compounds used by Microchip meet the UL94 VC (ul.com/global/eng/pages/offerings/industries/chemi protective "tubes" in which the specific product is shin "reels" may be made from PVC plastic. Suchip Technology Incorporated believes the informat original packing materials is true and correct to the eleteness and accuracy of data in this form because mation is often protected from disclosure as trade servided only as estimates of the average weight of the	ad via internal design controls, suppl chemical substance is NOT an intent document, there is no credible reasing regulatory scheme world-wide. I flammability standard for plastics. I cals/plastics/ mipped are made from polyvinyl chlor tion in this form concerning substance best of its knowledge and belief, as cit has been compiled based on the recrets and some information may not see parts and the average weight of a see parts and the average w	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concertous concertous and the unavoidable impurity of the date listed in this form. Microchip Technologinges provided in Material Safety Data Sheets protave been provided by subcontract assemblers inticipated significant toxic metals components. The unavoidable is components.	I, to the best of ntration of the to obtain a test old the packing ncorporated's s gy Incorporate vided by raw n and raw materi	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara naterial supplie	chnology tance, if ter box and devices in intee the ers. Supplier		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.49
chive 2002/53/EC (End-of-Life Vehicles (ELV) Directive pliance with the above EU Directives has been verified hemical substance is absent from the list above, the porated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for ing compounds used by Microchip meet the UL94 VC/UL.com/global/eng/pages/offerings/industries/chemi protective "tubes" in which the specific product is shin "reels" may be made from PVC plastic. Sochip Technology Incorporated believes the informat original packing materials is true and correct to the obleteness and accuracy of data in this form because mation is often protected from disclosure as trade selected only as estimates of the average weight of the sof dopants, metals, and non-metal materials contain the provided only and the provided ones not provide any anties provided by Microchip Technology Incorporated toos not provide any anties provided by Microchip Technology Incorporated toos, sales order acknowledgement, and invoices.	and via internal design controls, supple chemical substance is NOT an inter document, there is no credible reasion regulatory scheme world-wide. It is a substance of lammability standard for plastics. It is cals/plastics/ nipped are made from polyvinyl chlor did not in this form concerning substance best of its knowledge and belief, as called the substance of t	ier declarations, and /or analytical test data. Itional ingredient in the semiconductor device and on to believe that the unavoidable impurity conceivous can access the UL iQTM family of databases the decease of the conceivous can access the UL iQTM family of databases the decease of the conceivous can be conceived by RoHS in Microchip Technology In the date listed in this form. Microchip Technology are provided in Material Safety Data Sheets prothave been provided by subcontract assemblers inticipated significant toxic metals components. To in the finished parts.	I, to the best of ntration of the to obtain a test old the packing ncorporated's gy incorporate vided by raw n and raw materi'hese estimate:	Microchip Tec chemical subs report at slip on the ou semiconductor d cannot guara aterial supplie al suppliers. Ir s do not include sive, limited pr	chnology tance, if ter box and devices in antee the ers. Supplier formation le trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.49
pliance with the above EU Directives has been verified hemical substance is absent from the list above, the porated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for ing compounds used by Microchip meet the UL94 VC/uL.com/global/eng/pages/offerings/industries/chemiporotective "tubes" in which the specific product is shin "reels" may be made from PVC plastic. The product is the information of the product of the information of the product of the information of the product of the information is often protected from disclosure as trade stookied only as estimates of the average weight of the of dopants, metals, and non-metal materials contain orbit prochology Incorporated does not provide any untiles provided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interprovided by Microchip Technology Incorporated in the provided any interpretable provided and provided any interpretable	and via internal design controls, supple chemical substance is NOT an intending document, there is no credible reasion regulatory scheme world-wide. Of lammability standard for plastics. Of lammability standard for plastics. On inpediare made from polyvinyl chlor children in this form concerning substantiation in this form concerning substantiation in the secrets and some information may not ese parts and the average weight of a ined within silicon devices (silicon IC) of warranty, express or implied, with med and its subsidiaries are contained for changes to Material Content Declar of the users' reliance on the information.	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concervous concervous care to be the concervous care to be the concervous care to be the concervous care to be concervous	I, to the best of ntration of the to obtain a test old the packing incorporated's sylincorporated vided by raw in and raw materithese estimate:	Microchip Tecchemical substance of the microsubstance of the micro	chnology tance, if ter box and devices in intee the errs. Supplier information le trace	0.29	Opped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 100.00 % of Total Weight 100 100.00	0.49
iliance with the above EU Directives has been verifice semical substance is absent from the list above, the borated's knowledge and belief as of the date of this is not below the threshold of regulatory concern for any compounds used by Microchip meet the UL94 VG ul.com/global/eng/pages/offerings/industries/chemi rotective "tubes" in which the specific product is she "reels" may be made from PVC plastic. This Technology Incorporated believes the informatoriginal packing materials is true and correct to the leteness and accuracy of data in this form because aution is often protected from disclosure as trade sevided only as estimates of the average weight of the of dopants, metals, and non-metal materials contain chip Technology Incorporated does not provide any nities provided by Microchip Technology Incorporated tons, sales order acknowledgement, and invoices. Chip disclaims any duty to notify users of updates of wise, suffered by users or third parties as a result of the second content of the paties as a result of the second content of the paties as a result of the	and via internal design controls, supple chemical substance is NOT an intending document, there is no credible reasion regulatory scheme world-wide. Of lammability standard for plastics. Of lammability standard for plastics. On inpediare made from polyvinyl chlor children in this form concerning substantiation in this form concerning substantiation in the secrets and some information may not ese parts and the average weight of a ined within silicon devices (silicon IC) of warranty, express or implied, with med and its subsidiaries are contained for changes to Material Content Declar of the users' reliance on the information.	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device and on to believe that the unavoidable impurity concervous concervous care to be the concervous care to be the concervous care to be the concervous care to be concervous	I, to the best of ntration of the to obtain a test old the packing incorporated's sylincorporated vided by raw in and raw materithese estimate:	Microchip Tecchemical substance of the microsubstance of the micro	chnology tance, if ter box and devices in intee the errs. Supplier information le trace	0.29	(mg) Total (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 100.00 % of Total Weight 100 100.00 % of Total Weight	0.49

ST 14 TSSOP 11:17 AM: 8/29/2013

MICROCHIP Semiconductor Devic	e Type: ST 16 (Lead)	TSSOP 4.4mm (D8)		nation Base A pper Alloy (C	•		•	ogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight			22.50	(mg) Total	Mold Compound	% ot Total Weight	t 34.62
Silica, vitreous (or fused)	60676-86-0	Mold Compound	29.427	mg/part 19.128	ppm 294,270		Silica, vitreous (or fused)	60676-86-0	85.00	1
Epoxy Resin	Trade Secret	Mold Compound	3.012	1.958	30.119		Epoxy Resin	Trade Secret	85.00	4
Phenolic Resin	Trade Secret	Mold Compound	2.077	1.350	20,772		Phenolic Resin	Trade Secret	6.00	1
Carbon Black	1333-86-4	Mold Compound	0.104	0.068	1,039		Carbon Black	1333-86-4	0.30	-
Copper	7440-50-8	Lead Frame	44,468	28.904	444.680		Carbon Black	Total	100.00	7
Nickel	7440-02-0	Lead Frame	1.186	0.771	11,859	30.35	(mg) Total	Lead Frame	% of Total Weight	
Silver	7440-22-4	Lead Frame	0.779	0.507	7.793	30.33	Copper	7440-50-8	95.24	1 40.03
Silicon	7440-21-3	Lead Frame	0.210	0.307	2.101		Nickel	7440-02-0	2.54	-1
Magnesium	7439-95-4	Lead Frame	0.047	0.030	467		Silver	7440-02-0	1.67	
Silver	7440-22-4	Die Attach	2.472	1.607	24.716		Silicon	7440-21-3	0.45	
Epoxy resin	Trade Secret	Die Attach	0.668	0.434	6,680		Magnesium	7439-95-4	0.10	
Metal oxide	Trade Secret	Die Attach	0.100	0.065	1.002		magnooiam	Total	100.00	- 1
Gamma-butvrolactone	96-48-0	Die Attach	0.100	0.065	1,002	2.17	(mg) Total	Die Attach	% of Total Weight	
Silicon	7440-21-3	Chip (Die)	12.340	8.021	123,400	2.17	Silver	7440-22-4	74	3.54
Gold	7440-57-5	Wire Bond	0.610	0.397	6.100		Epoxy resin	Trade Secret	20	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.400	1.560	24.000		Metal oxide	Trade Secret	20	
	7440-51-5	TOTALS:	100.000	65.000	1.000.000		Gamma-butyrolactone	96-48-0	3	
	0.0650	Total Mass		00.000	.,000,000		Carrina Batyrolactorio	Total	100.00	<u> </u>
This semiconductor device and its homogenous materials Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive)	comply with EU Directive 20		HS Recast Dire	ctive) and with	EU	8.02	T.(.)()		ov . (T . (. 1) V . (. 1	
	<i>,</i> .					0.02	Total (mg)	Chip (Die)	% of Total Weight	t 12.34
Compliance with the above EU Directives has been verified	d via internal design controls					0.02	Doped Silicon	7440-21-3	100	
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a	d via internal design controls chemical substance is NOT a document, there is no credit any regulatory scheme world	in intentional ingredient in the semiconductor device and the reason to believe that the unavoidable impurity conce- wide.	ntration of the	chemical subs		0.02	(3)	,		
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this	d via internal design controls chemical substance is NOT a document, there is no credit iny regulatory scheme world flammability standard for pla	in intentional ingredient in the semiconductor device and the reason to believe that the unavoidable impurity conce- wide.	ntration of the	chemical subs		0.40	(3)	7440-21-3	100	
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the concernated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 VO	d via internal design controls chemical substance is NOT a document, there is no credit iny regulatory scheme world flammability standard for pla als/plastics/	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce- wide. stics. You can access the UL iQTM family of databases	entration of the	chemical subs	tance, if		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	t 0.61
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi	d via internal design controls chemical substance is NOT a document, there is no credit into regulatory scheme world flammability standard for places of the standard form polyvin on in this form concerning substandard form the standard form to standard formation in the s	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce-wide. Instics. You can access the UL IQTM family of databases of the UL iQTM family of databases of the IQTM family of databases of the IQTM family of databases of the IQTM family of	ntration of the to obtain a test old the packing ncorporated's gy Incorporate vided by raw n and raw mater	report at slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir	ter box and devices in intee the ers. Supplier		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	t 0.61
Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shicertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatitheir original packing materials is true and correct to the b completeness and accuracy of data in this form because it information is often protected from disclosure as trade set is provided only as estimates of the average weight of the:	d via internal design controls chemical substance is NOT a document, there is no credit inly regulatory scheme world flammability standard for places of the	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity conce-wide. Instics. You can access the UL iQTM family of databases of the least of the date listed in this form. Microchip Technology I idef, as of the date listed in this form. Microchip Technolog in the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers gight of anticipated significant toxic metals components. To icon IC) in the finished parts.	ntration of the to obtain a test old the packing ncorporated's gy Incorporate voided by raw in and raw mater These estimate tion. The exclu	report at y slip on the ou semiconductor d cannot guara naterial supplie ial suppliers. Ir s do not includ sive, limited pr	ter box and devices in intee the ers. Supplier information le trace		Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	t 0.61
Compliance with the above EU Directives has been verified if a chemical substance is absent from the list above, the clincorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shicertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatitheir original packing materials is true and correct to the becompleteness and accuracy of data in this form because information is often protected from disclosure as trade set is provided only as estimates of the average weight of the levels of dopants, metals, and non-metal materials contain Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate	d via internal design controls chemical substance is NOT a document, there is no credit into regulatory scheme world flammability standard for places of the	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concervide. Instics. You can access the UL iQTM family of databases by the concervity of chloride (PVC) plastic. "Window envelopes" used to help ubstances restricted by RoHS in Microchip Technology lief, as of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ght of anticipated significant toxic metals components. To icon IC) in the finished parts. I, with respect to the information provided in this declarantained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, dispersions.	ntration of the to obtain a test old the packing ncorporated's gy incorporate vided by raw n and raw mater These estimate tion. The exclusale. These are irect or indirect	report at y slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pr e provided in M t, consequentia	ter box and devices in intee the irrs. Supplier iformation te trace coduct licrochip's	0.40	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100	t 0.61
Compliance with the above EU Directives has been verified a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shicertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the informatitheir original packing materials is true and correct to the becompleteness and accuracy of data in this form because information is often protected from disclosure as trade set information is often protected from disclosure as trade set is provided only as estimates of the average weight of the levels of dopants, metals, and non-metal materials contain Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or otherwise, suffered by users or third parties as a result of	d via internal design controls chemical substance is NOT a document, there is no credit into regulatory scheme world flammability standard for places of the	in intentional ingredient in the semiconductor device and le reason to believe that the unavoidable impurity concervide. Instics. You can access the UL iQTM family of databases by the concervity of chloride (PVC) plastic. "Window envelopes" used to help ubstances restricted by RoHS in Microchip Technology lief, as of the date listed in this form. Microchip Technology in the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers ght of anticipated significant toxic metals components. To icon IC) in the finished parts. I, with respect to the information provided in this declarantained in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, dispersions.	ntration of the to obtain a test old the packing ncorporated's gy incorporate vided by raw n and raw mater These estimate tion. The exclusale. These are irect or indirect	report at y slip on the ou semiconductor d cannot guara naterial supplie al suppliers. Ir s do not includ sive, limited pr e provided in M t, consequentia	ter box and devices in intee the irrs. Supplier iformation te trace coduct licrochip's	0.40	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100 100.00 % of Total Weight	t 0.61

ST 16 TSSOP 11:17 AM : 8/29/2013

AICROCHIP Semiconductor Devic	e Type: ST 20 (Lead)	TSSOP 4.4mm (G2 / GE)		nation Base A	•		•	nogeneous Materials: e.g. pc boards, displa		JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total					I		
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	37.22	(mg) Total	Mold Compound	% ot Total Weight	47.72
Silica, vitreous (or fused)	60676-86-0	Mold Compound	40.562	31.638	405,620		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	4.152	3.238	41,516		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	2.863	2.233	28,632		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound	0.143	0.112	1,432		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	40.725	31.766	407,251			Total		
Nickel	7440-02-0	Lead Frame	1.086	0.847	10,861	33.35	(mg) Total	Lead Frame	% of Total Weight	42.76
Silver	7440-22-4	Lead Frame	0.714	0.557	7.137		Copper	7440-50-8	95.24	
Silicon	7440-22-4	Lead Frame	0.714	0.150	1,137		Nickel	7440-02-0	2.54	
Magnesium	7440-21-3	Lead Frame	0.192	0.033	428		Silver	7440-02-0	1.67	
Silver	7440-22-4	Die Attach	1.317	1.027	13.172		Silicon	7440-21-3	0.45	
Epoxy resin	Trade Secret	Die Attach	0.356	0.278	3.560		Magnesium	7439-95-4	0.45	
Metal oxide	Trade Secret	Die Attach	0.053	0.042	534		wagnosium	Total	100.00	J
Gamma-butyrolactone	96-48-0	Die Attach	0.053	0.042	534	1.39	(mg) Total	Die Attach	% of Total Weight	1.78
Silicon	7440-21-3	Chip (Die)	4.690	3,658	46.900	1.55	Silver	7440-22-4	74 74	1.70
Gold	7440-21-3	Wire Bond	0.540	0.421	5.400		Epoxy resin	Trade Secret	20	
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	2.510	1.958	25,100		Metal oxide	Trade Secret	3	
1111	7440010	TOTALS:	100.000	78.000	1.000.000		Gamma-butyrolactone	96-48-0	3	
	0.0780	Total Mass		. 0.000	1,000,000		Carrina batyrolactorio	Total	-	l
s semiconductor device and its homogenous materials								1		
s semiconductor device and its nomogenous materials	s comply with EU Directive 20				and with EII					
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	,	EU (RoHS Rec	ast Directive)	and with EU	3.66	Total (mg)	Chip (Die)	% of Total Weight	4.69
, , ,	•	, ,	`	cast Directive)	and with EU	3.66	·	Chip (Die) 7440-21-3	_	4.69
npliance with the above EU Directives has been verifie	ed via internal design control	s, supplier declarations, and /or analytical test da	ta.	·		3.66	Total (mg) Doped Silicon		% of Total Weight 100 100.00	4.69
npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the hnology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of	od via internal design controls chemical substance is NOT a e date of this document, ther regulatory concern for any re	s, supplier declarations, and /or analytical test da an intentional ingredient in the semiconductor de re is no credible reason to believe that the unavoi agulatory scheme world-wide.	ta. evice and, to th	ne best of Micr concentratio	rochip n of the		Doped Silicon	7440-21-3 Total	100	
npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the hnology Incorporated's knowledge and belief as of the	d via internal design control: chemical substance is NOT a e date of this document, ther regulatory concern for any re	s, supplier declarations, and /or analytical test da an intentional ingredient in the semiconductor de re is no credible reason to believe that the unavoi agulatory scheme world-wide.	ta. evice and, to th	ne best of Micr concentratio	rochip n of the	0.42	·	7440-21-3	100	0.54
npliance with the above EU Directives has been verifie chemical substance is absent from the list above, the hnology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of a	d via internal design controls chemical substance is NOT a e date of this document, ther regulatory concern for any re of flammability standard for pl cals/plastics/	s, supplier declarations, and /or analytical test data an intentional ingredient in the semiconductor de e is no credible reason to believe that the unavoi egulatory scheme world-wide. lastics. You can access the UL iQTM family of data	vice and, to th dable impurity abases to obta	ne best of Microconcentration	rochip n of the ort at		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
npliance with the above EU Directives has been verified chemical substance is absent from the list above, the hnology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of a ding compounds used by Microchip meet the UL94 Vo.://ul.com/global/eng/pages/offerings/industries/chemi protective "tubes" in which the specific product is she	d via internal design controls chemical substance is NOT a detect of this document, ther regulatory concern for any real flammability standard for ploals/plastics/sipped are made from polyvirgion in this form concerning sect to the best of its knowled in this form because it has bected from disclosure as tradisc estimates of the average we	s, supplier declarations, and /or analytical test data intentional ingredient in the semiconductor determine is no credible reason to believe that the unavoingulatory scheme world-wide. Jastics. You can access the UL IQTM family of data and control of the cont	nota. vice and, to the dable impurity abases to obtain the date of the date o	ne best of Microconcentration ain a test report e packing slip corated's semi nology Incorp Data Sheets p y subcontract lificant toxic n	rochip n of the on the outer conductor corated provided by a sassemblers netals		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
npliance with the above EU Directives has been verified chemical substance is absent from the list above, the hoology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of a ding compounds used by Microchip meet the UL.94 V0. "//ul.com/global/eng/pages/offerings/industries/chemi protective "tubes" in which the specific product is shand certain "reels" may be made from PVC plastic. To the protective in their original packing materials is true and cornot guarantee the completeness and accuracy of data material suppliers. Information is provided only a material suppliers. Information is provided only a suppliers. Information is provided only a suppliers. Information is provided only a suppliers.	d via internal design controls chemical substance is NOT are date of this document, ther regulatory concern for any real flammability standard for plocals/plastics/sipped are made from polyvirgion in this form concerning sect to the best of its knowled in this form because it has bected from disclosure as tradicts estimates of the average word dopants, metals, and non-	s, supplier declarations, and /or analytical test data intentional ingredient in the semiconductor determine is no credible reason to believe that the unavoingulatory scheme world-wide. It is a constant to the constant of	nota. vice and, to the dable impurity abases to obtain the notage incorphic prochip Technic and the notage in provided by the provided by the provided by the notage incorphic incorporated sign (silicon IC) in a declaration.	ne best of Mici concentratio ain a test repo e packing slip orated's semi nology Incorpo Data Sheets p y subcontract ificant toxic n the finished p	or ochip n of the ort at on the outer conductor corated orovided by assemblers netals surts.		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.54
piliance with the above EU Directives has been verified chemical substance is absent from the list above, the hinology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of a ding compounds used by Microchip meet the UL94 Vo. "//ul.com/global/eng/pages/offerings/industries/chemil protective "tubes" in which the specific product is shand certain "reels" may be made from PVC plastic. The protective "tubes" in which the specific product is shand certain "reels" may be made from PVC plastic. The protective in their original packing materials is true and cornot guarantee the completeness and accuracy of data material suppliers. Information is often protective material suppliers. Information is provided only apponents. These estimates do not include trace levels to prochip Technology Incorporated does not provide any duct warranties provided by Microchip Technology Incorporated.	d via internal design controls chemical substance is NOT a e date of this document, ther regulatory concern for any real flammability standard for pl cals/plastics/ hipped are made from polyvir ion in this form concerning sect to the best of its knowled in this form because it has beated from disclosure as tradiscestimates of the average word dopants, metals, and non-warranty, express or implied corporated and its subsidiarid gement, and invoices.	s, supplier declarations, and /or analytical test data intentional ingredient in the semiconductor determine is no credible reason to believe that the unavoingulatory scheme world-wide. It is a contained in the semiconductor determine it is a contained in the unavoingulatory scheme world-wide. It is a contained in the semiconductor is a contained in the semiconductor in the semicond	ta. vice and, to the dable impurity abases to obtain the control of the control	ne best of Microconcentration ain a test report e packing slip orated's semi anology Incorp Data Sheets p y subcontract ifficant toxic in the finished p The exclusive, of sale. These	rochip n of the ort at on the outer conductor porated provided by a cassemblers netals parts. limited e are	0.42	(mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin	100 100.00 % of Total Weight 100 100.00	0.54
appliance with the above EU Directives has been verified chemical substance is absent from the list above, the hnology Incorporated's knowledge and belief as of the mical substance, if any, is not below the threshold of a ding compounds used by Microchip meet the UL94 Vo.://ul.com/global/eng/pages/offerings/industries/chemi protective "tubes" in which the specific product is shand certain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the informatices in their original packing materials is true and cornot guarantee the completeness and accuracy of data material suppliers. Supplier information is often prote raw material suppliers. Information is provided only a sponents. These estimates do not include trace levels proceed the provided only incorporated does not provide any duct warranties provided by Microchip Technology Incorporated does not provide in Microchip's quotations, sales order acknowles or ochip disclaims any duty to notify users of updates of therwise, suffered by users or third parties as a result the process of the provide of the provide of the process or the provide of the process or the process or the provide of the process or the process	d via internal design controls chemical substance is NOT a e date of this document, ther regulatory concern for any real flammability standard for pl cals/plastics/ hipped are made from polyvir ion in this form concerning sect to the best of its knowled in this form because it has beated from disclosure as tradiscestimates of the average word dopants, metals, and non-warranty, express or implied corporated and its subsidiarid gement, and invoices.	s, supplier declarations, and /or analytical test data intentional ingredient in the semiconductor determine is no credible reason to believe that the unavoingulatory scheme world-wide. It is a contained in the semiconductor determine it is a contained in the unavoingulatory scheme world-wide. It is a contained in the semiconductor is a contained in the semiconductor in the semicond	ta. vice and, to the dable impurity abases to obtain the control of the control	ne best of Microconcentration ain a test report e packing slip orated's semi anology Incorp Data Sheets p y subcontract ifficant toxic in the finished p The exclusive, of sale. These	rochip n of the ort at on the outer conductor porated provided by a cassemblers netals parts. limited e are	0.42	(mg) Total (mg) Total (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 bour.	100 100.00 % of Total Weight 100 100.00 % of Total Weight	0.54

ST 14 TSSOP 11:17 AM : 8/29/2013

MICROCHIP Semiconductor Device	e Type: QU8E 08 (Lead) U	SON/UDFN 2x2x0.55mm (QN)		ation Base A			•	ogeneous Materials: e.g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In"	% Total			9.40	(mg) Total	Mold Compound	% ot Total Weight	75.18
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	3.40				75.10
Silica, fused	60676-86-0	Mold Compound	67.662	8.458	676,620		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound	3.646	0.456	36,462		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.646	0.456	36,462		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.226	0.028	2,255		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	20.505	2.563	205,054			Total		
Nickel	7440-02-0	Lead Frame	0.547	0.068	5,469	2.69	(mg) Total	Lead Frame	% of Total Weight	21.53
Silicon	7440-21-3	Lead Frame	0.097	0.012	969		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.022	0.003	215		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.359	0.045	3,593		Silicon	7440-21-3	0.45	
Silver	7440-22-4	Die Attach	0.800	0.100	8,000		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade secret	Die Attach	0.200	0.025	2,000		Silver	7440-22-4	1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	1.090	0.136	10,900			Total	100.00	
Doped Gold	7440-57-5	Wire Bond	0.310	0.039	3,100	0.13	(mg) Total	Die Attach	% of Total Weight	1.00
Tin	7440-31-5 Plating	on external leads (pins) - Matte Tin / annealed at 150°C for 1 hou	ır 0.890	0.111	8.900		Silver	7440-22-4	80.00	
		TOTAL		12.500	1.000.000		Epoxy Resin	Trade secret	20.00	
This semiconductor device and its homogenous materials Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive)			oHS Recast Dire	ective) and wi	th EU	0.14	(mg) Total	Total Chip (Die)	100.00 % of Total Weight	
	comply with EU Directive 2002/95/E via internal design controls, suppl hemical substance is NOT an inten locument, there is no credible reas ny regulatory scheme world-wide. lammability standard for plastics. N	C (RoHS Directive), EU Directive 2011/65/EU (Ro ier declarations, and /or analytical test data. tional ingredient in the semiconductor device ar on to believe that the unavoidable impurity conc	nd, to the best o entration of the	f Microchip T chemical sul	echnology	0.14	(mg) Total Gallium arsenide (mg) Total		% of Total Weight	1.09
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this cany, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 Vo	comply with EU Directive 2002/95/E via internal design controls, suppl hemical substance is NOT an inten locument, there is no credible reas ny regulatory scheme world-wide. lammability standard for plastics. Nals/plastics/	C (RoHS Directive), EU Directive 2011/65/EU (Ro ier declarations, and /or analytical test data. tional ingredient in the semiconductor device ar on to believe that the unavoidable impurity conc You can access the UL iQTM family of databases	nd, to the best o centration of the s to obtain a tes	f Microchip T chemical sul t report at	echnology ostance, if		Gallium arsenide	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5	% of Total Weight 100 100.00 % of Total Weight 100.00	1.09
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the concorporated's knowledge and belief as of the date of this cany, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information their original packing materials is true and correct to the the completeness and accuracy of data in this form becaus supplier information is often protected from disclosure as information is provided only as estimates of the average with the concept of the average with the complete of the average with the comp	comply with EU Directive 2002/95/E via internal design controls, suppl hemical substance is NOT an inten locument, there is no credible reas- ny regulatory scheme world-wide. lammability standard for plastics. \(\) als/plastics/ oped are made from polyvinyl chlor on in this form concerning substance best of its knowledge and belief, a ise it has been compiled based on it trade secrets and some information eight of these parts and the averag erials contained within silicon device	ier (RoHS Directive), EU Directive 2011/65/EU (Roier declarations, and /or analytical test data. tional ingredient in the semiconductor device aron to believe that the unavoidable impurity concording to the concording to the concording the concording to the conco	nd, to the best of the set of the set of the packing incorporated's nology incorpor, is provided by resemblers and romponents. The	f Microchip T chemical sul t report at g slip on the d semiconduct ated cannot g aw material s ese estimates	echnology ostance, if outer box or devices quarantee uppliers. s do not		Gallium arsenide	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Total	% of Total Weight 100 100.00 % of Total Weight	1.09
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified f a chemical substance is absent from the list above, the of noorporated's knowledge and belief as of the date of this or any, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in their original packing materials is true and correct to the the completeness and accuracy of data in this form becaus Supplier information is often protected from disclosure as information is provided only as estimates of the average we notlude trace levels of dopants, metals, and non-metal mat Microchip Technology Incorporated does not provide any of warranties provided by Microchip Technology Incorporated Microchip's quotations, sales order acknowledgement, and Microchip disclaims any duty to notify users of updates or	via internal design controls, suppl hemical substance is NOT an inten locument, there is no credible reasing regulatory scheme world-wide. Immability standard for plastics. Vals/plastics/ oped are made from polyvinyl chloron in this form concerning substance best of its knowledge and belief, a seit has been compiled based on the trade secrets and some information eight of these parts and the average rials contained within silicon device varranty, express or implied, with read and its subsidiaries are contained Invoices.	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device are on to believe that the unavoidable impurity concurrence of the data is the unavoidable impurity concurrence of the unavoidable impurity concurrence of the data is the unavoidable impurity of databases ide (PVC) plastic. "Window envelopes" used to the ser restricted by RoHS in Microchip Technology is of the date listed in this form. Microchip Technology is of the date listed in this form. Microchip Technology is of the date listed in Material Safety Data Sheet in may not have been provided by subcontract as eweight of anticipated significant toxic metals of the unit of the information provided in this declar in Microchip's standard terms and conditions of the data of the unit of	nd, to the best of centration of the set to obtain a tes hold the packing incorporated's nology incorporated by resemblers and reomponents. The action. The exclusive sale. These are direct or indirect or indire	f Microchip T chemical sult t report at g slip on the e semiconduct ated cannot g aw material s aw material s ese estimate: usive, limited e provided in	echnology ostance, if for a control of the control		Gallium arsenide (mg) Total Doped Gold (mg) Total	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.31
Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive) Compliance with the above EU Directives has been verified of a chemical substance is absent from the list above, the oncorporated's knowledge and belief as of the date of this only, is not below the threshold of regulatory concern for a Molding compounds used by Microchip meet the UL94 V0 http://ul.com/global/eng/pages/offerings/industries/chemic The protective "tubes" in which the specific product is shi and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in their original packing materials is true and correct to the the completeness and accuracy of data in this form becaus Supplier information is often protected from disclosure as information is provided only as estimates of the average w include trace levels of dopants, metals, and non-metal mat Microchip Technology Incorporated does not provide any warranties provided by Microchip Technology Incorporate Microchip's quotations, sales order acknowledgement, and	comply with EU Directive 2002/95/E via internal design controls, suppl hemical substance is NOT an inten locument, there is no credible reas- ny regulatory scheme world-wide. lammability standard for plastics. \(\) als/plastics/ oped are made from polyvinyl chlor on in this form concerning substance best of its knowledge and belief, a set it has been compiled based on it trade secrets and some information eight of these parts and the averag erials contained within silicon devic varranty, express or implied, with r a and its subsidiaries are contained it invoices. changes to Material Content Declar the users' reliance on the informati-	ier declarations, and /or analytical test data. tional ingredient in the semiconductor device are on to believe that the unavoidable impurity concurrence of the data is the unavoidable impurity concurrence of the unavoidable impurity concurrence of the data is the unavoidable impurity of databases ide (PVC) plastic. "Window envelopes" used to the ser restricted by RoHS in Microchip Technology is of the date listed in this form. Microchip Technology is of the date listed in this form. Microchip Technology is of the date listed in Material Safety Data Sheet in may not have been provided by subcontract as eweight of anticipated significant toxic metals of the unit of the information provided in this declar in Microchip's standard terms and conditions of the data of the unit of	nd, to the best of centration of the set to obtain a tes hold the packing incorporated's nology incorporated by resemblers and reomponents. The action. The exclusive sale. These are direct or indirect or indire	f Microchip T chemical sult t report at g slip on the e semiconduct ated cannot g aw material s aw material s ese estimate: usive, limited e provided in	echnology ostance, if for a control of the control	0.04	Gallium arsenide (mg) Total Doped Gold	Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	% of Total Weight 100 100.00 % of Total Weight 100.00 100.00	0.31

QU8E 08 USON_UDFN 11:17 AM: 8/29/2013

AICROCHIP Semiconductor Device	Type: QUAE 08	(Lead) USON 2x2x0.55mm (UA)		ation Base A	. ,			nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	1,7,2	"Contained In"	% Total			9.40	(mg) Total	Mold Compound	% ot Total Weight	75.18
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	3.40	(ilig) Total	word Compound	78 Ot Total Weight	73.10
Silica, fused	60676-86-0	Mold Compound	67.662	8.458	676,620		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound	3.646	0.456	36,462		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.646	0.456	36,462		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.226	0.028	2,255		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	20.505	2.563	205,054			Total	100.00	
Nickel	7440-02-0	Lead Frame	0.547	0.068	5,469	2.69	(mg) Total	Lead Frame	% of Total Weight	21.53
Silicon	7440-21-3	Lead Frame	0.097	0.012	969		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.022	0.003	215		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.359	0.045	3,593		Silicon	7440-21-3	0.45	
Silver	7440-22-4	Die Attach	0.800	0.100	8,000		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade secret	Die Attach	0.200	0.025	2,000		Silver	7440-22-4	1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	1.090	0.136	10,900		Į .	Total	100.00	
Doped Gold	7440-57-5	Wire Bond	0.310	0.039	3,100	0.13	(mg) Total	Die Attach	% of Total Weight	1.00
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	0.890	0.111	8,900	00	Silver	7440-22-4	80.00	1.00
1111	7440-31-3	TOTALS:		12.500	1,000,000		Epoxy Resin	Trade secret	20.00	
	2 2425	a Total Mass	100.000	12.000	1,000,000		Ероху ПСЗІІ	Total	100.00	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	mply with EU Directive 20	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ctive) and wi	th EU	0.14	(mg) Total Gallium arsenide	Chip (Die)	% of Total Weight	1.09
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). bliance with the above EU Directives has been verified vi nemical substance is absent from the list above, the che	mply with EU Directive 20 a internal design controls mical substance is NOT a	002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	to the best of	f Microchip T	echnology	0.14		,		1.09
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified vinemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for anying compounds used by Microchip meet the UL94 V0 flar	mply with EU Directive 20 a internal design controls mical substance is NOT a rument, there is no credit regulatory scheme world nmability standard for pla	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, the reason to believe that the unavoidable impurity concer	to the best of	f Microchip To chemical sub	echnology	0.14		1303-00-0	100	0.31
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). bliance with the above EU Directives has been verified vinemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc snot below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 flar lul.com/globalleng/pages/offerings/industries/chemicals.orotective "tubes" in which the specific product is shippy	mply with EU Directive 20 a internal design controls mical substance is NOT a cument, there is no credit regulatory scheme world nmability standard for pla (plastics/	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH s, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concer wide.	to the best of ntration of the o obtain a test	f Microchip To chemical sub report at	echnology ostance, if		Gallium arsenide	1303-00-0 Total	100 100.00	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vist chemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 flar //ul.com/global/eng/pages/offerings/industries/chemicals. protective "tubes" in which the specific product is shippy certain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information eir original packing materials is true and correct to the completeness and accuracy of data in this form because is olieir information is often protected from disclosure as tra-	mply with EU Directive 20 a internal design controls mical substance is NOT a cument, there is no credit regulatory scheme world nmability standard for pla plastics/ ed are made from polyvin n this form concerning se set of its knowledge and be t has been compiled base de secrets and some inch th of these parts and the	102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerwide. Instics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to houbstances restricted by RoHS in Microchip Technology In belief, as of the date listed in this form. Microchip Technolog don the ranges provided in Material Safety Data Sheets, correction may not have been provided by subcontract asset average weight of anticipated significant toxic metals cor	to the best of itration of the o obtain a test old the packing acceptorated's logy incorpora provided by ra emblers and ra	f Microchip To chemical sub report at g slip on the of semiconduct ated cannot g aw material s aw material s	echnology ostance, if outer box or devices judrantee uppliers.		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vihemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flar (/ul.com/global/eng/pages/offerings/industries/chemicals.porotective "tubes" in which the specific product is shipperentain "reels" may be made from PVC plastic. pochip Technology Incorporated believes the information is prioriginal packing materials is true and correct to the be ompleteness and accuracy of data in this form because in olier information is often protected from disclosure as tramation is provided only as estimates of the average weig de trace levels of dopants, metals, and non-metal matericochip Technology Incorporated does not provide any wai anties provided by Microchip Technology Incorporated a	mply with EU Directive 20 a internal design controls mical substance is NOT a cument, there is no credib regulatory scheme world nmability standard for pla (plastics/ ed are made from polyvin n this form concerning s est of its knowledge and b t has been compiled base de secrets and some info th of these parts and the als contained within silico rranty, express or implied nd its subsidiaries are co	102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerwide. Instics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to houbstances restricted by RoHS in Microchip Technology In belief, as of the date listed in this form. Microchip Technolog don the ranges provided in Material Safety Data Sheets, correction may not have been provided by subcontract asset average weight of anticipated significant toxic metals cor	to the best of the packing the packing accorporated's logy incorporated's million and the packing incorporated by remblers and remplers and remplers. The ion. The exclusion.	f Microchip Tochemical substitute report at g slip on the consecution of the consecution	echnology ostance, if outer box or devices puarantee uppliers. suppliers suppliers or devices puarantee product		Gallium arsenide (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vistemical substance is absent from the list above, the che rporated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ling compounds used by Microchip meet the UL94 V0 flar if/ul.com/global/eng/pages/offerings/industries/chemicals. protective "tubes" in which the specific product is shippy certain "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information is eir original packing materials is true and correct to the brompleteness and accuracy of data in this form because olier information is often protected from disclosure as tra mation is provided only as estimates of the average weig det trace levels of dopants, metals, and non-metal materi- ochip Technology Incorporated does not provide any was anties provided by Microchip Technology Incorporated a ochip's quotations, sales order acknowledgement, and in ochip disclaims any duty to notify users of updates or che	mply with EU Directive 20 a internal design controls mical substance is NOT a rument, there is no credit regulatory scheme world nmability standard for pla plastics/ ad are made from polyvin n this form concerning s est of its knowledge and it t has been compiled base de secrets and some info the of these parts and the als contained within silice rranty, express or implied nd its subsidiaries are co voices. anges to Material Conten users' reliance on the in	102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerwide. Instics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to houbstances restricted by RoHS in Microchip Technology In belief, as of the date listed in this form. Microchip Technolog don the ranges provided in Material Safety Data Sheets; average weight of anticipated significant toxic metals coron devices (silicon IC) in the finished parts.	to the best of the total the packing accorporated's cogy incorporated by remblers and ramponents. The exclusiale. These are	f Microchip To chemical sub- report at g slip on the of semiconduct ated cannot g aw material s aw material s ase estimates usive, limited e provided in t, consequen	echnology ostance, if couter box or devices puarantee uppliers. suppliers on to the product		(mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100.00	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified vi hemical substance is absent from the list above, the che prorated's knowledge and belief as of the date of this doc is not below the threshold of regulatory concern for any ing compounds used by Microchip meet the UL94 V0 flar (//ul.com/global/eng/pages/offerings/industries/chemicals.protective "tubes" in which the specific product is shippedertain "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the information is eir original packing materials is true and correct to the bompleteness and accuracy of data in this form because is obtained in the provided only as estimates of the average weig de trace levels of dopants, metals, and non-metal materiachip Technology Incorporated does not provide any war anties provided by Microchip Technology Incorporated as chip's quotations, sales order acknowledgement, and in pochip disclaims any duty to notify users of updates or chrowise, suffered by users or third parties as a result of the	mply with EU Directive 20 a internal design controls mical substance is NOT a rument, there is no credit regulatory scheme world nmability standard for pla plastics/ ad are made from polyvin n this form concerning s est of its knowledge and it t has been compiled base de secrets and some info the of these parts and the als contained within silice rranty, express or implied nd its subsidiaries are co voices. anges to Material Conten users' reliance on the in	102/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs, supplier declarations, and /or analytical test data. In intentional ingredient in the semiconductor device and, ole reason to believe that the unavoidable impurity concerwide. Instics. You can access the UL iQTM family of databases to yl chloride (PVC) plastic. "Window envelopes" used to ho belief, as of the date listed in this form. Microchip Technology In the light of the total provided in Material Safety Data Sheets in the toxic metals coron devices (silicon IC) in the finished parts. In with respect to the information provided in this declaratintained in Microchip's standard terms and conditions of standard terms and conditions of standard terms and conditions of standard terms and damages, dir	to the best of the total the packing accorporated's cogy incorporated by remblers and ramponents. The exclusiale. These are	f Microchip To chemical sub- report at g slip on the of semiconduct ated cannot g aw material s aw material s ase estimates usive, limited e provided in t, consequen	echnology ostance, if couter box or devices puarantee uppliers. suppliers on to the product	0.04	(mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100.00 100.00 % of Total Weight 100.00	0.31

QUAE 08 USON 11:17 AM : 8/29/2013

MICROCHIP	Times OVEF 100 at a VO	200		nation Base opper Alloy (•	nogeneous Materials: e.g. pc boards, display:	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Semiconductor Devic	e Type: QX6E 06 (Lead) XS0	JN 1.5x1.5x0.45mm (QX) "Contained In"	% Total		,			1		
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	4.18	(mg) Total	Mold Compound	% ot Total Weight	68.55
Silica, fused	60676-86-0	Mold Compound	61.695	3.763	616.950		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound	3.325	0.203	33.247		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.325	0.203	33,247		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.206	0.013	2,057		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	23.696	1.445	236,960			Total	100.00	_
Nickel	7440-02-0	Lead Frame	0.632	0.039	6,320	1.52	(mg) Total	Lead Frame	% of Total Weight	24.88
Silicon	7440-21-3	Lead Frame	0.112	0.007	1,120		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.025	0.002	249		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.415	0.025	4,152		Silicon	7440-21-3	0.45	
Ag	7440-22-4	Die Attach	0.990	0.060	9,900		Magnesium	7439-95-4	0.10	
Epoxy resin	Trade secret	Die Attach	0.198	0.012	1,980		Silver	7440-22-4	1.67	
Aliphatic anhydride	Trade secret	Die Attach	0.066	0.004	660			Total	100.00	
2-Butoxyethyl acetate	112-07-2	Die Attach	0.033	0.002	330	0.08	(mg) Total	Die Attach	% of Total Weight	1.32
Polymeric material	Trade secret	Die Attach	0.033	0.002	330		Ag	7440-22-4	75.00	
Silicon	1303-00-0	Chip (Die)	3.630	0.221	36,300		Epoxy resin	Trade secret	15.00	
Au	7440-57-5	Wire Bond	0.590	0.036	5,899		Aliphatic anhydride	Trade secret	5.00	
impurity	Misc.	Wire Bond	0.000	0.000	1		2-Butoxyethyl acetate	112-07-2	2.50	
Tin	7440-31-5 Plating on	external leads (pins) - Matte Tin / annealed at 150°C for 1	hour 1.030	0.063	10,300		Polymeric material	Trade secret	3	
1111	1 1 10 0 1 0 1 Idding on						r diyirieric material		Ū	1
1111	T TTO OT O	TOT		6.100	1,000,000		r olyment material	Trade secret Total	100.00	<u> </u>
	0.0061 g Tota	TOT I Mass	ALS: 100.000	6.100	1,000,000	0.22	(mg) Total		Ū	3.63
s semiconductor device and its homogenous materials o active 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	0.0061 g Tota comply with EU Directive 2002/95/EC	TOT I Mass (RoHS Directive), EU Directive 2011/65/EU	ALS: 100.000	6.100	1,000,000	0.22		Total	100.00	3.63
semiconductor device and its homogenous materials of ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Ipliance with the above EU Directives has been verified themical substance is absent from the list above, the ctroorated's knowledge and belief as of the date of this d	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplie nemical substance is NOT an intentic ocument, there is no credible reasor	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data.	ALS: 100.000 RoHS Recast Direction and, to the best o	6.100 ective) and wit	1,000,000 th EU echnology	0.22	(mg) Total	Total Chip (Die) 1303-00-0	100.00 % of Total Weight	
s semiconductor device and its homogenous materials of civive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this distribution, is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 file.	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplies the memical substance is NOT an intention ocument, there is no credible reason y regulatory scheme world-wide. ammability standard for plastics. You ammability standard for plastics. You	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data. onal ingredient in the semiconductor device t to believe that the unavoidable impurity co	ALS: 100.000 RoHS Recast Dire and, to the best o	6.100 ective) and wit of Microchip To chemical sub	1,000,000 th EU echnology		(mg) Total GaAs	Total Chip (Die) 1303-00-0 Total	100.00 % of Total Weight 100 100.00	
s semiconductor device and its homogenous materials of active 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this directive, is not below the threshold of regulatory concern for an iding compounds used by Microchip meet the UL94 V0 files/dul.com/global/eng/pages/offerings/industries/chemicae protective "tubes" in which the specific product is ship	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplie memical substance is NOT an intentiocument, there is no credible reason y regulatory scheme world-wide. ammability standard for plastics. You is/plastics/	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data. conal ingredient in the semiconductor device n to believe that the unavoidable impurity co	ALS: 100.000 ROHS Recast Dire and, to the best o ncentration of the	6.100 ective) and with finite field of the f	1,000,000 th EU echnology ostance, if		(mg) Total GaAs (mg) Total	Total Chip (Die) 1303-00-0 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	
is semiconductor device and its homogenous materials of ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive), impliance with the above EU Directives has been verified chemical substance is absent from the list above, the clorporated's knowledge and belief as of the date of this did, is not below the threshold of regulatory concern for an idding compounds used by Microchip meet the UL94 V0 floy/ul.com/global/eng/pages/offerings/industries/chemicae protective "tubes" in which the specific product is shipd certain "reels" may be made from PVC plastic. crochip Technology Incorporated believes the informationir original packing materials is true and correct to the be impleteness and accuracy of data in this form because it polier information is often protected from disclosure as tormation is provided only as estimates of the average we	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplie nemical substance is NOT an intenticocument, there is no credible reasor y regulatory scheme world-wide. ammability standard for plastics. Your scheme world-wide ammability standard for plastics. You ped are made from polyvinyl chlorid in in this form concerning substance st of its knowledge and belief, as of has been compiled based on the ran rade secrets and some information light of these parts and the average	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data. onal ingredient in the semiconductor device n to believe that the unavoidable impurity or u can access the UL iQTM family of databa le (PVC) plastic. "Window envelopes" used s restricted by RoHS in Microchip Technolo the date listed in this form. Microchip Tech ges provided in Material Safety Data Sheets may not have been provided by subcontrac weight of anticipated significant toxic metal	and, to the best on centration of the best on obtain a test o hold the packing gy Incorporated's tology Incorporated's assemblers and research.	6.100 ective) and with finding and with the chemical substitute of the control of	1,000,000 th EU echnology ostance, if outer box or devices in rantee the liers. uppliers.		(mg) Total GaAs (mg) Total Au	Total Chip (Die) 1303-00-0 Total Wire Bond	100.00 % of Total Weight 100 100.00 % of Total Weight	0.59
is semiconductor device and its homogenous materials of ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive), impliance with the above EU Directives has been verified to chemical substance is absent from the list above, the chorporated's knowledge and belief as of the date of this divided of the compounds used by Microchip meet the UL94 Volf ply/lul.com/global/eng/pages/offerings/industries/chemicate protective "tubes" in which the specific product is ship divided certain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the informationis original packing materials is true and correct to the being pleteness and accuracy of data in this form because it pplier information is often protected from disclosure as to ormation is provided only as estimates of the average we clude trace levels of dopants, metals, and non-metal metarcochip Technology Incorporated does not provide any wrranties provided by Microchip Technology Incorporated totations, sales order acknowledgement, and invoices.	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplie nemical substance is NOT an intentiocument, there is no credible reason y regulatory scheme world-wide. ammability standard for plastics. You is/plastics/ ped are made from polyvinyl chloric in in this form concerning substance st of its knowledge and belief, as of has been compiled based on the ran rade secrets and some information light of these parts and the average rials contained within silicon device arranty, express or implied, with rese	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data. onal ingredient in the semiconductor device n to believe that the unavoidable impurity co u can access the UL iQTM family of databa e (PVC) plastic. "Window envelopes" used s restricted by RoHS in Microchip Technolo the date listed in this form. Microchip Tech ges provided in Material Safety Data Sheets may not have been provided by subcontract weight of anticipated significant toxic metal is (silicon IC) in the finished parts.	and, to the best on centration of the ses to obtain a test o hold the packing y incorporated's sology incorporated by raw is assemblers and rescomponents. The accident in the second in	6.100 ctive) and with the following of Microchip Tourist chemical substituting slip on the construction of the following cannot guamaterial supplays we material see estimates susive, limited	1,000,000 th EU echnology stance, if outer box or devices in rantee the liers. uppliers. do not		(mg) Total GaAs (mg) Total Au	Total Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Misc.	100.00 % of Total Weight 100 100.00 % of Total Weight 99.99 0.01	0.59
s semiconductor device and its homogenous materials of active 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the of opporated's knowledge and belief as of the date of this of a compounds used by Microchip meet the UL94 V0 fill/ful.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is ship certain "reels" may be made from PVC plastic. rochip Technology Incorporated believes the information or original packing materials is true and correct to the be upleteness and accuracy of data in this form because it ipplier information is often protected from disclosure as the provided only as estimates of the average we used trace levels of dopants, metals, and non-metal mate prochip Technology Incorporated does not provide any we ranties provided by Microchip Technology Incorporated	0.0061 g Total comply with EU Directive 2002/95/EC via internal design controls, supplie nemical substance is NOT an intentio comment, there is no credible reason y regulatory scheme world-wide. ammability standard for plastics. Yo ls/plastics/ ped are made from polyvinyl chloric in in this form concerning substance st of its knowledge and belief, as of nas been compiled based on the ran rade secrets and some information in right of these parts and the average rials contained within silicon device arranty, express or implied, with res and its subsidiaries are contained in changes to Material Content Declara he users' reliance on the information	I Mass (RoHS Directive), EU Directive 2011/65/EU r declarations, and /or analytical test data. onal ingredient in the semiconductor device n to believe that the unavoidable impurity co u can access the UL iQTM family of databa le (PVC) plastic. "Window envelopes" used s restricted by RoHS in Microchip Technolo the date listed in this form. Microchip Tech ges provided in Material Safety Data Sheets nay not have been provided by subcontrac weight of anticipated significant toxic metal is (silicon IC) in the finished parts. spect to the information provided in this dec n Microchip's stalndard terms and condition	and, to the best on centration of the best on the best of the best	6.100 ective) and with the chemical substitute of the content of the chemical substitute of the chemical supplication of the chemical supplication of the chemical supplication of the chemical substitute of the	1,000,000 th EU echnology patance, if puter box or devices in rantee the liers. uppliers. do not product Microchip's tial or	0.04	(mg) Total GaAs (mg) Total Au impurity	Total Chip (Die) 1303-00-0 Total Wire Bond 7440-57-5 Misc. Total	100.00 % of Total Weight 100 % of Total Weight 99.99 0.01 100.00	0.59

QX6E 06 XSON 11:18 AM: 8/29/2013

AICROCHIP Semiconductor Device	e Type: QX8E 08 (Lead))	(SON 2x2x0.45mm (Q7)		nation Base /				ogeneous Materials: .g. pc boards, display	rs)	JEDEC 97 Product Markin and/or Pkg. Labeling e3
Paris Outralian	040 Normalism	"Contained In" Sub-Component	% Total Weight			8.14	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number	·		mg/part	ppm		Silica, fused	60676-86-0	90.00	ı
Silica, fused Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	71.820 3.870	7.326 0.395	718,200 38,703		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	3.870	0.395	38,703		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.239	0.024	2.394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.000	1.020	100,003		•	Total	100.00	<u>u</u>
Nickel	7440-02-0	Lead Frame	0.267	0.027	2,667	1.07	(mg) Total	Lead Frame	% of Total Weight	10.5
Silicon	7440-21-3	Lead Frame	0.047	0.005	473		Copper	7440-50-8	95.24	
Magnesium	7439-95-4	Lead Frame	0.011	0.001	105		Nickel	7440-02-0	2.54	
Silver	7440-22-4	Lead Frame	0.175	0.018	1,752		Silicon	7440-21-3	0.45	
Ag	7440-22-4	Die Attach	0.563	0.057	5,625		Magnesium	7439-95-4	0.10	
Epoxy resin	Trade secret	Die Attach	0.113	0.011	1,125		Silver	7440-22-4	1.67	
Aliphatic anhydride	Trade secret	Die Attach	0.038	0.004	375			Total	100.00	
2-Butoxyethyl acetate	112-07-2	Die Attach	0.019	0.002	188	80.0	(mg) Total	Die Attach	% of Total Weight	0.75
Polymeric material	Trade secret	Die Attach	0.019	0.002	188		Ag	7440-22-4	75.00	
GaAs Gold	1303-00-0 7440-57-5	Chip (Die) Wire Bond	7.500 0.200	0.765 0.020	75,000 2,000		Epoxy resin	Trade secret	15.00	
Gold Tin		ng on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.020	12,500		Aliphatic anhydride 2-Butoxyethyl acetate	Trade secret 112-07-2	5.00 2.50	
IIII	7440-31-5 Platin	g on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour TOTALS:		10.200	1,000,000		Polymeric material	Trade secret	3	
	0.0102 g To		100.000	10.200	1,000,000		r diyinenc matenar	Total	100.00	<u>u</u>
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and wi	th EU	0.77	(mg) Total	Chip (Die)	% of Total Weight	7.5
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified hemical substance is absent from the list above, the c	via internal design controls, sup hemical substance is NOT an inte	plier declarations, and /or analytical test data.	to the best o	of Microchip T	echnology	0.77	(mg) Total GaAs	Chip (Die) 1303-00-0 Total	% of Total Weight 100 100.00	7.5
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified Iliance with the above EU Directives has been verified Iliance with the list above, the c Iliance with a born the list above, the c Iliance with a born the list above, the c Iliance with a born the list above, the c Iliance with a born the list above, the c Iliance with a born the list above, the c Iliance with a born the list above, the li	via internal design controls, sup hemical substance is NOT an inte locument, there is no credible rea ny regulatory scheme world-wide. lammability standard for plastics.	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ison to believe that the unavoidable impurity concen	to the best o	of Microchip T chemical sul	echnology	0.77	·	1303-00-0	100	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified hemical substance is absent from the list above, the croporated's knowledge and belief as of the date of this dis not below the threshold of regulatory concern for aring compounds used by Microchip meet the UL94 V0 f/ful.com/global/eng/pages/offerings/industries/chemicaprotective "tubes" in which the specific product is ship	via internal design controls, supp hemical substance is NOT an inte locument, there is no credible rea ny regulatory scheme world-wide. lammability standard for plastics. als/plastics/	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, sson to believe that the unavoidable impurity concen-	to the best o tration of the o obtain a tes	of Microchip T e chemical sub t report at	echnology ostance, if		GaAs	1303-00-0 Total	100	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this distriction is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 follow. It is a substance of the distriction of the compounds of the distriction of the compounds of the compounds of the compound of the compounds of the compound of	via internal design controls, supplemmical substance is NOT an intellocument, there is no credible really regulatory scheme world-wide. Ilammability standard for plastics. als/plastics/	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, uson to believe that the unavoidable impurity concent. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to ho	to the best o tration of the o obtain a tes	of Microchip T e chemical sub treport at g slip on the o	echnology ostance, if - - - -		GaAs (mg) Total	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this of is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 food is compounds used by Microchip meet the UL94 V0 food is compounds used by Microchip meet the UL94 V0 food is compounds used by Microchip meet the UL94 V0 food in the completenes in which the specific product is ship certain "reels" may be made from PVC plastic. To cochip Technology Incorporated believes the information is roriginal packing materials is true and correct to the completeness and accuracy of data in this form becaus plier information is often protected from disclosure as immation is provided only as estimates of the average were also as the servage were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immation is provided only as estimates of the average were also considered from disclosure as immatically as a set	via internal design controls, supplemental substance is NOT an internal design controls, supplemental substance is NOT an internal yergulatory scheme world-wide. Iammability standard for plastics. Is/plastics/ upped are made from polyvinyl chlorin in this form concerning substance in the substance of its knowledge and belief, se it has been compiled based on trade secrets and some informatically to these parts and the average of these parts and the average of the secrets and some informatical secrets and some informatical secrets and some informatically to these parts and the average.	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ison to believe that the unavoidable impurity concent. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to ho nices restricted by RoHS in Microchip Technology In as of the date listed in this form. Microchip Technol the ranges provided in Material Safety Data Sheets on may not have been provided by subcontract assege weight of anticipated significant toxic metals cor	to the best of tration of the obtain a test of the packin corporated's ogy Incorpor ovided by remblers and remblers and remblers and remblers and removed the object of th	of Microchip T chemical substitute of the chemic	echnology stance, if outer box or devices juarantee juapliers. juppliers.		GaAs (mg) Total	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this doing is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 found in the complete of the composition of the composit	via internal design controls, supplemental substance is NOT an intellocument, there is no credible really regulatory scheme world-wide. Iammability standard for plastics. Is/plastics/ upped are made from polyvinyl chlorn in this form concerning substantes of its knowledge and belief, the it has been compiled based on trade secrets and some informatieght of these parts and the averal relials contained within silicon devivarranty, express or implied, with and its subsidiaries are contained	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ison to believe that the unavoidable impurity concent. You can access the UL iQTM family of databases to oride (PVC) plastic. "Window envelopes" used to homes restricted by RoHS in Microchip Technology In as of the date listed in this form. Microchip Technol the ranges provided in Material Safety Data Sheets in on may not have been provided by subcontract assege weight of anticipated significant toxic metals corrices (silicon IC) in the finished parts. respect to the information provided in this declaration.	to the best of tration of the obtain a test of obtain a test of the packin corporated's ogy Incorpor orovided by miblers and monents. The on. The exclusion	of Microchip T of chemical substitute of the che	echnology pstance, if outer box or devices purantee puppliers. s do not product		GaAs (mg) Total	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.2
is semiconductor device and its homogenous materials is citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this or, is not below the threshold of regulatory concern for an iding compounds used by Microchip meet the UL94 V0 for the compounds used by Microchip meet the UL94 V0 for the compounds used by Microchip meet the UL94 V0 for the compounds used by Microchip meet the UL94 V0 for the compounds used by Microchip meet the UL94 V0 for the compounds used by Microchip meet the UL94 V0 for the compounds used to the specific product is ship certain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information is formation is often protected from disclosure as immation is provided only as estimates of the average woulde trace levels of dopants, metals, and non-metal matericate in the compound of the trochip Technology Incorporated does not provide any variaties provided by Microchip Technology Incorporated conchip's quotations, sales order acknowledgement, and conchip disclaims any duty to notify users of updates or rewise, suffered by users or third parties as a result of the fithis Certificate of Compliance for semiconductor production and the complex of the complex	via internal design controls, supplemental substance is NOT an internal design controls, supplemental substance is no credible reapy regulatory scheme world-wide. Iammability standard for plastics. Ials/plastics/ oped are made from polyvinyl chloring in this form concerning substance in this form concerning sub	plier declarations, and /or analytical test data. entional ingredient in the semiconductor device and, ison to believe that the unavoidable impurity concent. You can access the UL iQTM family of databases to pride (PVC) plastic. "Window envelopes" used to how the concess restricted by RoHS in Microchip Technology In as of the date listed in this form. Microchip Technol the ranges provided in Material Safety Data Sheets on may not have been provided by subcontract assege weight of anticipated significant toxic metals corrices (silicon IC) in the finished parts. respect to the information provided in this declarated in Microchip's standard terms and conditions of sarations and shall not be liable for any damages, directions of the seminary	to the best of tration of the contration of the contration of the corporated's ogy incorpor provided by remblers and reponents. The contration. The exclusion. The exclusion of the contration o	of Microchip T chemical subtractions of the chemical subtraction of the chemical subtr	echnology stance, if outer box or devices juarantee uppliers. uppliers. s do not product	0.02	GaAs (mg) Total Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for	100 100.00 % of Total Weight 100.00	0.2

QX8E 08 XSON 11:18 AM: 8/29/2013

MICROCHIP Semiconductor Device	ce Type: XX8E 08 (Le	ead) X2SON 2x2x0.35mm (X8)		mination Bas Copper Alloy	,			nogeneous Materials: e.g. pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
		"Contained In" Sub-Component	% Total Weight			2.86	(mg) Total	Mold Compound	% ot Total Weight	51.99
Basic Substance Silica, fused	CAS Number 60676-86-0	Mold Compound	46,791	mg/part 2.574	ppm 467.910		Silica, fused	60676-86-0	90.00	
Epoxy Resin	Trade Secret	Mold Compound Mold Compound	2.522	0.139	25.215		Epoxy Resin	Trade Secret	4.85	
Phenolic Resin	Trade Secret	Mold Compound	2.522	0.139	25,215		Phenolic Resin	Trade Secret	4.85	
Carbon Black	1333-86-4	Mold Compound	0.156	0.009	1,560		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	38.649	2.126	386.488		Carbon black	Total	100.00	
Nickel	7440-02-0	Lead Frame	1.031	0.057	10.307	2.23	(mg) Total	Lead Frame	% of Total Weight	40.58
Silicon				0.037	- /	2.23				40.58
	7440-21-3	Lead Frame Lead Frame	0.183		1,826		Copper	7440-50-8	95.24	
Magnesium Silver	7439-95-4 7440-22-4	Lead Frame Lead Frame	0.041	0.002	406 6,773		Nickel Silicon	7440-02-0 7440-21-3	2.54 0.45	
Silver	7440-22-4	Die Attach	1.888	0.104	18,880		Magnesium	7439-95-4	0.10	
Epoxy Resin	Trade secret	Die Attach	0.472	0.026	4,720		Silver	7440-22-4	1.67	
Gallium arsenide (GaAs)	1303-00-0	Chip (Die)	2.360	0.130	23,600			Total	100.00	
Doped Gold	7440-57-5	Wire Bond	0.720	0.040	7,200	0.13	(mg) Total	Die Attach	% of Total Weight	2.36
Tin	7440-31-5	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.990	0.109	19,900		Silver	7440-22-4	80.00	
		TOTALS:	100.000	5.500	1,000,000		Epoxy Resin	Trade secret	20.00	
	0.0055 a	ı Total Mass						Total	100.00	=
002/53/EC (End-of-Life Vehicles (ELV) Directive).						0.13	(mg) Total	Chip (Die)	% of Total Weight	2.36
•		**	o the best o	f Microchip Te	chnology		Gallium arsenide	1303-00-0 Total	100 100.00	2.50
a chemical substance is absent from the list above, the ci corporated's knowledge and belief as of the date of this o not below the threshold of regulatory concern for any re- olding compounds used by Microchip meet the UL94 V0 i	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. flammability standard for plas	intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concent	ration of the	chemical sub		0.04	-	1303-00-0	100	
ompliance with the above EU Directives has been verified a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this control to below the threshold of regulatory concern for any reguloiding compounds used by Microchip meet the UL94 V0 (ttp://ul.com/global/eng/pages/offerings/industries/chemic: the protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic.	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. flammability standard for plas als/plastics/	intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concentration. You can access the UL iQTM family of databases to	ration of the	chemical sub	stance, if any,		Gallium arsenide	1303-00-0 Total	100	
a chemical substance is absent from the list above, the cincorporated's knowledge and belief as of the date of this cincorporated's knowledge and belief as of the date of this cincot below the threshold of regulatory concern for any regu	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. flammability standard for plas als/plastics/ oped are made from polyvinyl on in this form concerning subset of its knowledge and belief has been compiled based on parts and some information may parts and the average weight.	intentional ingredient in the semiconductor device and, to reason to believe that the unavoidable impurity concent titics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole postances restricted by RoHS in Microchip Technology Ind., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provided by subcontract assemblers are of anticipated significant toxic metals components. Thes	ration of the obtain a test d the packing corporated's Incorporate ded by raw n d raw mater	t report at g slip on the o semiconducte d cannot guar naterial supplirial suppliers. I	uter box and or devices in antee the ers. Supplier nformation is		Gallium arsenide	1303-00-0 Total Wire Bond	100 100.00 % of Total Weight	
a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this control below the threshold of regulatory concern for any regulation of the second of the local property of the protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the informatic heir original packing materials is true and correct to the beompleteness and accuracy of data in this form because it information is often protected from disclosure as trade secrovided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of these provided only as estimates of the average weight of the avera	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. flammability standard for plas als/plastics/ oped are made from polyvinyl on in this form concerning subsets of its knowledge and belief has been compiled based on retts and some information may parts and the average weight silicon devices (silicon IC) in warranty, express or implied, warranty, express or implied, warranty, express or implied, and occasions and some control in the substance of the substance in the substance is substanced in the substance is substanced in the substance is not substanced in the substance	intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concent titics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hol obstances restricted by RoHS in Microchip Technology Ind., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provided you not have been provided by subcontract assemblers are of anticipated significant toxic metals components. Thes the finished parts.	obtain a test d the packing corporated's Incorporate ded by raw in d raw mater e estimates on. The exclu	t report at g slip on the o semiconducto d cannot guar naterial suppliers. I do not include usive, limited p	uter box and or devices in antee the ers. Supplier nformation is trace levels of		Gallium arsenide	1303-00-0 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.72
a chemical substance is absent from the list above, the clacorporated's knowledge and belief as of the date of this clacorporated's knowledge and belief as of the date of this clacorporated's knowledge and belief as of the date of this claim to the low the threshold of regulatory concern for any regulatory concern for any regulatory compounds used by Microchip meet the UL94 V0 of the protective "tubes" in which the specific product is shipertain "reels" may be made from PVC plastic. Ilicrochip Technology Incorporated believes the informatic eleir original packing materials is true and correct to the be completeness and accuracy of data in this form because it formation is often protected from disclosure as trade sec rovided only as estimates of the average weight of these popants, metals, and non-metal materials contained within discrochip Technology Incorporated does not provide any varranties provided by Microchip Technology Incorporated	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. Ilammability standard for plas als/plastics/ oped are made from polyvinyl on in this form concerning subset of its knowledge and belief has been compiled based on rets and some information marts and the average weight silicon devices (silicon IC) in warranty, express or implied, it and its subsidiaries are contichanges to Material Content I	intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concentrations. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole obstances restricted by RoHS in Microchip Technology Integrated in this form. Microchip Technology the ranges provided in Material Safety Data Sheets proviay not have been provided by subcontract assemblers are of anticipated significant toxic metals components. These the finished parts. With respect to the information provided in this declaration in Microchip's standard terms and conditions of subcolarations and shall not be liable for any damages, directed.	obtain a tesi d the packin corporated's Incorporated ded by raw in d raw mater e estimates on. The exclude. These are ct or indirec	t report at g slip on the o semiconducte d cannot guar naterial suppli rial suppliers. I do not include usive, limited p e provided in I	uter box and or devices in antee the ers. Supplier information is trace levels of oroduct Microchip's	0.04	Gallium arsenide (mg) Total Doped Gold	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	100 100.00 % of Total Weight 100.00	0.72
a chemical substance is absent from the list above, the cicorporated's knowledge and belief as of the date of this cont below the threshold of regulatory concern for any report of the control of the co	hemical substance is NOT an document, there is no credible gulatory scheme world-wide. Ilammability standard for plas als/plastics/ oped are made from polyvinyl on in this form concerning subset of its knowledge and belief has been compiled based on rets and some information marts and the average weight silicon devices (silicon IC) in warranty, express or implied, it and its subsidiaries are contichanges to Material Content I	intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concentrations. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hole obstances restricted by RoHS in Microchip Technology Integrated in this form. Microchip Technology the ranges provided in Material Safety Data Sheets proviay not have been provided by subcontract assemblers are of anticipated significant toxic metals components. These the finished parts. With respect to the information provided in this declaration in Microchip's standard terms and conditions of subcolarations and shall not be liable for any damages, directed.	obtain a tesi d the packin corporated's Incorporated ded by raw in d raw mater e estimates on. The exclude. These are ct or indirec	t report at g slip on the o semiconducte d cannot guar naterial suppli rial suppliers. I do not include usive, limited p e provided in I	uter box and or devices in antee the ers. Supplier information is trace levels of oroduct Microchip's	0.04	Gallium arsenide (mg) Total Doped Gold (mg) Total	Total Wire Bond 7440-57-5 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 100.00 100.00 % of Total Weight	0.72

XX8E 08 X2SON 11:18 AM : 8/29/2013

MICROCHIP	T Tl 26	NTI A		nation Base A pper Alloy (C				ogeneous Materials: .g. pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Semiconductor Device	Type: IL 36 (Lead									64
		"Contained In"	% Total			117.71	(mg) Total	Mold Compound	% ot Total Weight	t 79.8
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm		, 0,	•		
Silica, vitreous (or fused)	60676-86-0	Mold Compound	67.830	100.049	678,300		Silica, vitreous (or fused)	60676-86-0	85.00	
Epoxy Resin	Trade Secret	Mold Compound	6.943	10.240	69,426		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.788	7.062	47,880		Phenolic Resin	Trade Secret	6.00	-
Carbon Black	1333-86-4	Mold Compound	0.239	0.353	2,394		Carbon Black	1333-86-4	0.30	<u>]</u>
Copper	7440-50-8	Lead Frame	10.217	15.069	102,165			Total	100.00	
Iron	7439-89-6	Lead Frame	0.242	0.356	2,415	15.49	(mg) Total	Lead Frame	% of Total Weight	t 10.5
Phosphorous	7723-14-0	Lead Frame	0.026	0.039	263		Copper	7440-50-8	97.30	
Zinc (Metal)	7440-44-0	Lead Frame	0.016	0.023	158		Iron	7439-89-6	2.30	
Silver (Ag)	7440-22-4	Die Attach	0.589	0.868	5,888		Phosphorous	7723-14-0	0.25	
Proprietary Resin	Trade Secret	Die Attach	0.139	0.205	1,388		Zinc (Metal)	7440-44-0	0.15	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.023	0.033	225			Total	100.00	<u> </u>
Silicon	7440-21-3	Chip (Die)	7.500	11.063	75,000	1.11	(mg) Total	Die Attach	% of Total Weight	t_ 0.75
Gold	7440-57-5	Wire Bond	0.200	0.295	2,000		Silver (Ag)	7440-22-4	79	
Nickel	7440-02-0	Plating on external leads (pins) / annealed at 150°C for 1 hour	1.125	1.659	11.250		Proprietary Resin	Trade Secret	19	
Palladium	7440-05-03	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.092	625	Proprieta	ary Curing agent & Hardener	Trade Secret	3	
Gold	7440-57-5	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.092	625			Total	100.00	<u></u>
	•	TOTALS:	100.000	147.500	1,000,000	11.06	Total (mg)	Chip (Die)	% of Total Weight	t 7.5
	0 1475	g Total Mass			,,		Doped Silicon	7440-21-3	100	1
This semiconductor device and its homogenous materials co							Doped Silicon	7440-21-3	100.00	<u> </u>
Compliance with the above EU Directives has been verified v f a chemical substance is absent from the list above, the che	emical substance is NOT	an intentional ingredient in the semiconductor device and,				0.30	(mg) Total	Wire Bond	% of Total Weight	t 0.2
•	emical substance is NOT cument, there is no cred	an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concer				0.30	(mg) Total Doped Gold	Wire Bond 7440-57-5	% of Total Weight	0.2
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do	emical substance is NOT cument, there is no cred regulatory scheme work mmability standard for p	an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerd-wide.	ntration of the	chemical sub		0.30	, ,			
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 fla	emical substance is NOT cument, there is no cred regulatory scheme work immability standard for p s/plastics/	an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to	ntration of the	chemical sub	stance, if	1.84	, ,	7440-57-5	100	
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 fla http://ul.com/global/eng/pages/offerings/industries/chemicals The protective "tubes" in which the specific product is shipp	emical substance is NOT cument, there is no cred regulatory scheme work immability standard for ps/plastics/ ed are made from polyvi in this form concerning t of its knowledge and be as been compiled based its and some information rts and the average weig	an intentional ingredient in the semiconductor device and, ble reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic to the l	ntration of the obtain a test obtain a test old the packing accorporated's ly Incorporate rided by raw mand raw mater	chemical sub- report at g slip on the or semiconductor d cannot guar- naterial suppliers. I	uter box and or devices in antee the ers. Supplier nformation is		Doped Gold	7440-57-5 Total Plating on external leads (pins) / annealed at 150°C	100.00	
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 flanttp://ul.com/global/eng/pages/offerings/industries/chemicals/the protective "tubes" in which the specific product is shipp certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it he information is often protected from disclosure as trade secre provided only as estimates of the average weight of these parorovided only as estimates of the average weight of these pa	emical substance is NOT cument, there is no cred regulatory scheme work immability standard for ps/plastics/ ed are made from polyvi in this form concerning to fits knowledge and be as been compiled based ts and some information rts and the average weig a silicon devices (silicon urranty, express or implie	an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. Dlastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir elilef, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets provimay not have been provided by subcontract assemblers a thirt of anticipated significant toxic metals components. The IC) in the finished parts. d, with respect to the information provided in this declarated.	o obtain a test of the packing accorporated's y Incorporate yided by raw in and raw mater se estimates o ion. The exclu	report at g slip on the o semiconducto d cannot guar aterial supplie ial suppliers. I do not include	uter box and or devices in antee the ers. Supplier information is trace levels		Doped Gold (mg) Total	7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour	100 100.00 % of Total Weight	
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 flanttp://ul.com/global/eng/pages/offerings/industries/chemicals (The protective "tubes" in which the specific product is shipp pertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it hanformation is often protected from disclosure as trade secre provided only as estimates of the average weight of these pa of dopants, metals, and non-metal materials contained within Microchip Technology Incorporated a quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or chatherwise, suffered by users or third parties as a result of the	emical substance is NOT cument, there is no cred regulatory scheme work immability standard for ps/plastics/ ed are made from polyvi in this form concerning to fits knowledge and be as been compiled based as been compiled based in silicon devices (silicon urranty, express or implied its subsidiaries are changes to Material Conte susers' reliance on the insurer susers' reliance on	an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. Identics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir selief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimally not have been provided by subcontract assemblers and the of anticipated significant toxic metals components. The IC) in the finished parts. d, with respect to the information provided in this declarated ontained in Microchip's standard terms and conditions of sunt Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations.	o obtain a test of the packing accorporated's y Incorporate ided by raw n and raw mater se estimates of ion. The exclusiale. These are	report at g slip on the o semiconducto d cannot guar- naterial supplicial supplicial suppliers. I do not include usive, limited p e provided in N t, consequenti	uter box and or devices in antee the ers. Supplier information is trace levels eroduct Microchip's		Doped Gold (mg) Total Nickel	7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour 7440-02-0	100 100.00 % of Total Weight	
f a chemical substance is absent from the list above, the che ncorporated's knowledge and belief as of the date of this do any, is not below the threshold of regulatory concern for any Molding compounds used by Microchip meet the UL94 V0 flantp://ul.com/global/eng/pages/offerings/industries/chemicals/The protective "tubes" in which the specific product is shipp tertain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information heir original packing materials is true and correct to the best completeness and accuracy of data in this form because it hanformation is often protected from disclosure as trade secre provided only as estimates of the average weight of these pa of dopants, metals, and non-metal materials contained within Microchip Technology Incorporated does not provide any was warranties provided by Microchip Technology Incorporated a quotations, sales order acknowledgement, and invoices.	emical substance is NOT cument, there is no cred regulatory scheme work immability standard for ps/plastics/ ed are made from polyvi in this form concerning to fits knowledge and be as been compiled based as been compiled based in silicon devices (silicon urranty, express or implied its subsidiaries are changes to Material Conte susers' reliance on the insurer susers' reliance on	an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. Identics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir selief, as of the date listed in this form. Microchip Technology on the ranges provided in Material Safety Data Sheets provimally not have been provided by subcontract assemblers and the of anticipated significant toxic metals components. The IC) in the finished parts. d, with respect to the information provided in this declarated ontained in Microchip's standard terms and conditions of sunt Declarations and shall not be liable for any damages, dint Declarations and shall not be liable for any damages, dint Declarations.	o obtain a test of the packing accorporated's y Incorporate ided by raw n and raw mater se estimates of ion. The exclusiale. These are	report at g slip on the o semiconducto d cannot guar- naterial supplicial supplicial suppliers. I do not include usive, limited p e provided in N t, consequenti	uter box and or devices in antee the ers. Supplier information is trace levels eroduct Microchip's		Doped Gold (mg) Total Nickel	7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour 7440-02-0	100 100.00 % of Total Weight 90.00	1.25

TL 36 VTLA 11:18 AM : 8/29/2013

Semiconductor Device	Type: TI 44 (1 cc	d) VTI A execut 0mm (es)		nation Base A pper Alloy (C				nogeneous Materials: (e.g. pc boards, displays))	JEDEC 97 Product Marking and/or Pkg. Labeling e4
Semiconductor Device	Type: IL 44 (Lead									64
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	141.65	(mg) Total	Mold Compound	% ot Total Weight	79.8
Silica, vitreous (or fused)	60676-86-0	Mold Compound	67.830	120,398	678.300		Silica, vitreous (or fused)	60676-86-0	85.00	1
Epoxy Resin	Trade Secret	Mold Compound Mold Compound	6.943	12.323	69.426		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.788	8.499	47,880		Phenolic Resin	Trade Secret	6.00	
Carbon Black	1333-86-4	Mold Compound Mold Compound	0.239	0.425	2.394		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	10.217	18.134	102.165		Carbon Black	Total]
Iron	7439-89-6	Lead Frame	0.242	0.429	2,415	40.04	, ,-,,			
						18.64	(mg) Total	Lead Frame	% of Total Weight	10.5
Phosphorous	7723-14-0	Lead Frame	0.026	0.047	263		Copper	7440-50-8	97.30	
Zinc (Metal)	7440-44-0	Lead Frame	0.016	0.028	158		Iron	7439-89-6	2.30	
Silver (Ag)	7440-22-4	Die Attach	0.589	1.045	5,888		Phosphorous	7723-14-0	0.25	
Proprietary Resin	Trade Secret	Die Attach	0.139	0.246	1,388		Zinc (Metal)	7440-44-0	0.15	
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.023	0.040	225			Total	100.00	='
Silicon	7440-21-3	Chip (Die)	7.500	13.313	75,000	1.33	(mg) Total	Die Attach	% of Total Weight	0.75
Gold	7440-57-5	Wire Bond	0.200	0.355	2.000		Silver (Aa)	7440-22-4	79	
Nickel	7440-02-0	Plating on external leads (pins) / annealed at 150°C for 1 hour	1.125	1.997	11.250		Proprietary Resin	Trade Secret	19	
Palladium	7440-05-03	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.111	625	Proprietor	y Curing agent & Hardener	Trade Secret	3	
Gold	7440-57-5	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.111	625	Fioplicial	y Culling agent & Hardener	Total	Ū	J
Gold	7440-57-5									
		TOTALS:	100.000	177.500	1,000,000	13.31	Total (mg)	Chip (Die)	% of Total Weight	7.5
	0.1775	g Total Mass					Doped Silicon	7440-21-3	100	
, , , , ,		2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (Ro	HS Recast Direc	ctive) and with	EU	0.36	(mg) Total	Total		
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified v	via internal design contro	ols, supplier declarations, and /or analytical test data.		·		0.36	(mg) Total	Total Wire Bond	100.00 % of Total Weight	
liance with the above EU Directives has been verified vermical substance is absent from the list above, the choorated's knowledge and belief as of the date of this do	via internal design contro emical substance is NOT ocument, there is no cred	ols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and the reason to believe that the unavoidable impurity concurrence.	l, to the best of	Microchip Te	chnology	0.36	(mg) Total Doped Gold			
pliance with the above EU Directives has been verified we nemical substance is absent from the list above, the che porated's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for any	via internal design contro emical substance is NOT ocument, there is no cred or regulatory scheme worl	ols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and the reason to believe that the unavoidable impurity concurrence.	d, to the best of entration of the	Microchip Techemical subs	chnology	0.36		Wire Bond	% of Total Weight	0.2
liance with the above EU Directives has been verified vermical substance is absent from the list above, the cheorated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for anying compounds used by Microchip meet the UL94 V0 fit ul.com/global/eng/pages/offerings/industries/chemical-totective "tubes" in which the specific product is shipp	via internal design contro emical substance is NOT cument, there is no cred r regulatory scheme worl ammability standard for p s/plastics/	ols, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide.	d, to the best of entration of the to obtain a test	Microchip Techemical substreport at	chnology stance, if	2.22		Wire Bond 7440-57-5	% of Total Weight	0.2
iance with the above EU Directives has been verified of emical substance is absent from the list above, the che orated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any ag compounds used by Microchip meet the UL94 V0 fizul.com/global/eng/pages/offerings/industries/chemical otective "tubes" in which the specific product is shipp to "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information riginal packing materials is true and correct to the besteness and accuracy of data in this form because it hation is often protected from disclosure as trade secreted only as estimates of the average weight of these page.	via internal design control emical substance is NOT ocument, there is no cred or regulatory scheme worl ammability standard for p s/plastics/ oed are made from polyvi on in this form concerning t of its knowledge and b as been compiled based ets and some information arts and the average weige	an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. plastics. You can access the UL iQTM family of databases in the control of t	d, to the best of entration of the to obtain a test old the packing incorporated's gy incorporated yraw m and raw materi	Microchip Techemical substraints g slip on the or semiconducted cannot guaraterial supplie	chnology stance, if uter box and or devices in antee the ers. Supplier nformation is		Doped Gold	Wire Bond 7440-57-5 Total Plating on external leads (pins) / annealed at 150°C	% of Total Weight 100	0.2
liance with the above EU Directives has been verified we emical substance is absent from the list above, the che crated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any ag compounds used by Microchip meet the UL94 V0 flaul.com/global/eng/pages/offerings/industries/chemical: otective "tubes" in which the specific product is shipp no "reels" may be made from PVC plastic. The Technology Incorporated believes the information riginal packing materials is true and correct to the besteness and accuracy of data in this form because it heation is often protected from disclosure as trade secreted only as estimates of the average weight of these pants, metals, and non-metal materials contained within this Technology Incorporated does not provide any wattee provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the provided by Microchip Technology Incorporated and the contained withing the contained withing the provided by Microchip Technology Incorporated and the contained withing the conta	via internal design control emical substance is NOT coment, there is no cred or regulatory scheme worl ammability standard for p s/plastics/ oed are made from polyvi in in this form concerning it of its knowledge and be as been compiled based ets and some informatior arts and the average weig in silicon devices (silicon arranty, express or implie	an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. plastics. You can access the UL iQTM family of databases in the control of t	I, to the best of entration of the to obtain a test sold the packing incorporated's gy incorporated by raw mand raw materiese estimates dution. The exclusion of the estimates dution. The exclusion of the estimates of the estima	Microchip Techemical substraints of the order of the orde	chnology stance, if uter box and ir devices in antee the ers. Supplier aformation is trace levels		Doped Gold (mg) Total	Wire Bond 7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour	% of Total Weight 100 100.00 % of Total Weight	0.2
liance with the above EU Directives has been verified we mical substance is absent from the list above, the che to rated's knowledge and belief as of the date of this does not below the threshold of regulatory concern for anying compounds used by Microchip meet the UL94 V0 flaul.com/global/eng/pages/offerings/industries/chemical-rotective "tubes" in which the specific product is shipp in "reels" may be made from PVC plastic. The chip Technology Incorporated believes the information original packing materials is true and correct to the besteteness and accuracy of data in this form because it huation is often protected from disclosure as trade seer plants, metals, and non-metal materials contained within thip Technology Incorporated does not provide any wanties provided by Microchip Technology Incorporated it tions, sales order acknowledgement, and invoices. Chip disclaims any duty to notify users of updates or clivise, suffered by users or third parties as a result of the vision of the contractive of the c	via internal design control emical substance is NOT coment, there is no cred or regulatory scheme worl ammability standard for p s/plastics/ oed are made from polyvi in in this form concerning to fits knowledge and b as been compiled based ets and some information rarts and the average weig in silicon devices (silicon arranty, express or implie and its subsidiaries are c hanges to Material Conte te users' reliance on the in	an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conced-wide. Dastics. You can access the UL iQTM family of databases in concern the concern that the unavoidable impurity conceded in the concern that the unavoidable impurity conceded in the concern that the unavoidable impurity conceded in the concern that the unavoidable impurity concern unavoidable in the concern that the concern that the concern that the unavoidable in the concern that the unavoidable is the unavoidable is the concern that the unavoidable is the unavoidable is the unavoidable is the unavoidable in the unavoidab	I, to the best of entration of the to obtain a test to obtain a test told the packing incorporated's gy incorporated by raw maderiese estimates dution. The exclusiale. These are irect or indirect	Microchip Techemical substreport at g slip on the or semiconducted cannot guaraterial supplification of include sive, limited perovided in Marcochemical supplification of the provided in Marcochemical substreport of the provided in Marcochemical substrates and the provided in Marcochemical	chnology stance, if uter box and or devices in antee the ers. Supplier information is trace levels roduct flicrochip's		Doped Gold (mg) Total Nickel	Wire Bond 7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour 7440-02-0	% of Total Weight 100 100.00 % of Total Weight	0.2
poliance with the above EU Directives has been verified was memical substance is absent from the list above, the characterist knowledge and belief as of the date of this does not below the threshold of regulatory concern for anying compounds used by Microchip meet the UL94 VO flavul.com/global/eng/pages/offerings/industries/chemical/rotective "tubes" in which the specific product is shippin "reels" may be made from PVC plastic. The product is shipping the product of the best of the product of th	via internal design control emical substance is NOT coment, there is no cred or regulatory scheme worl ammability standard for p s/plastics/ oed are made from polyvi in in this form concerning to fits knowledge and b as been compiled based ets and some information rarts and the average weig in silicon devices (silicon arranty, express or implie and its subsidiaries are c hanges to Material Conte te users' reliance on the in	an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concidevide. Diastics. You can access the UL IQTM family of databases anyl chloride (PVC) plastic. "Window envelopes" used to be substances restricted by RoHS in Microchip Technology elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets promay not have been provided by subcontract assemblers plat of anticipated significant toxic metals components. The IC) in the finished parts. Ed, with respect to the information provided in this declarational in Microchip's standard terms and conditions of the Declarations and shall not be liable for any damages, don't in the provided and the provided in the provided in the provided in the second terms and conditions of the Declarations and shall not be liable for any damages, don't in the provided and the provided in the	I, to the best of entration of the to obtain a test to obtain a test told the packing incorporated's gy incorporated by raw maderiese estimates dution. The exclusiale. These are irect or indirect	Microchip Techemical substreport at g slip on the or semiconducted cannot guaraterial supplification of include sive, limited perovided in Marcochemical supplification of the provided in Marcochemical substreport of the provided in Marcochemical substrates and the provided in Marcochemical	chnology stance, if uter box and or devices in antee the ers. Supplier information is trace levels roduct flicrochip's		Doped Gold (mg) Total Nickel Palladium	Wire Bond 7440-57-5 Total Plating on external leads (pins) / annealed at 150°C for 1 hour 7440-02-0 7440-05-3	% of Total Weight 100 100.00 % of Total Weight 90.00 5.00	0.2

TL 44 VTLA 11:18 AM : 8/29/2013

MICROCHIP	DAVE 40 TEL			nination Base copper Alloy (geneous Materials: . pc boards, displays)	JEDEC 97 Product Marking and/or Pkg. Labeling e1
Semiconductor Device Type:	BINE 48 IFE	"Contained In"	% Total	1	1		T			ę,
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	71.63	(mg) Total	Mold Compound	% ot Total Weight	50.3
FUSED SILICA	60676-86-0	Mold Compound	38.981	55.509	389,810		FUSED SILICA	60676-86-0	77.50	
EPOXY RESINS, CURED	Trade Secret	Mold Compound	4.905	6.984	49.048		EPOXY RESINS,	Trade Secret	9.75	
HIGH CROSS-LINKED HIGH MOLECULAR EPOXY / EPOXY PHENOL RESIN	Trade Secret	Mold Compound	4.905	6.984	49,048		CURED HIGH CROSS-LINKED HIGH MOLECULAR EPOXY / EPOXY PHENOL RESIN	Trade Secret	9.75	
CRYSTALLINE SILICA	14808-60-7	Mold Compound	1.258	1.791	12,580		CRYSTALLINE SILICA	14808-60-7	2.50	
CARBON BLACK	1333-86-4	Mold Compound	0.252	0.358	2,515		CARBON BLACK	1333-86-4	0.50	
Copper	7440-50-8 65997-17-3	Lead Frame Lead Frame	8.052 4.800	11.467	80,524 48,000	31.94	() T-4-1	Total		22.43
Glass fibers Phenol, formaldehyde, (chloromethyl)oxirane polymer	9003-36-5	Lead Frame	4.800	6.835 6.835	48,000	31.94	(mg) Total Copper	<u>Lead Frame</u> 7440-50-8	% of Total Weight 35.90	22.43
Silica, chemically prepared	7631-86-9	Lead Frame	1.794	2.555	17.944		Glass fibers	65997-17-3	21.40	
Nickel	7440-02-0	Lead Frame	0.875	1.246	8,748		Phenol, formaldehyde, (chloromethyl)oxirane polymer	9003-36-5	21.40	
Barite	7727-43-7	Lead Frame	0.561	0.799	5,608		Silica, chemically	7631-86-9	8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.449	0.639	4,486		prepared Nickel	7631-86-9 7440-02-0	3.90	
Araldite GY 250	25068-38-6	Lead Frame	0.449	0.639	4,486		Barite	7727-43-7	2.50	
(2-Methoxymethylethoxy)propanol	34590-94-8	Lead Frame	0.179	0.256	1,794		Magnesium silicate	14807-96-6	2.00	
Misc.	system	Lead Frame	0.336	0.479	3,365		Araldite GY 250	25068-38-6	2.00	
Aluminium-hydroxide-oxide	24623-77-6	Lead Frame	0.112	0.160	1,122		Methoxymethylethoxy)pro panol	34590-94-8	0.80	
Gold	7440-57-5	Lead Frame	0.022	0.032	224		Misc.	system	1.50	
Silver	7440-22-4	Die Attach	0.552	0.786	5,520		Aluminium-hydroxide- oxide	24623-77-6	0.50	
Basic Duromer:Phenolic resin (Compound of polymeric network)	26834-02-6	Die Attach	0.138	0.197	1.380		Gold	7440-57-5	0.50	
Silicon	7440-21-3	Chip (Die)	7.650	10.894	76,500			Total	100.00	_!
Doped Gold	7440-57-5	Wire Bond	0.860	1.225	8,600	0.98	(mg) Total	Die Attach	% of Total Weight	0.69
Tin	7440-31-5	Plating on external leads (pins)	17.257	24.574	172,569		Silver Basic Duromer:Phenolic	7440-22-4	80.00	
Silver	7440-22-4	Plating on external leads (pins)	0.723	1.029	7,228		resin (Compound of polymeric network)	26834-02-6	20.00	
Copper	7440-50-8	Plating on external leads (pins) TOTAI	0.090 LS: 100.000	0.129	904	10.89	(mg) Total	Total	100.00	7.65
	0.1424 ~	Fotal Mass	_3. 100.000							
This semiconductor device and its homogenous materials comply with 2002/53/EC (End-of-Life Vehicles (ELV) Directive).				142.400	1,000,000	10.89		Chip (Die)	% of Total Weight	
			oHS Recast Dire		, ,	10.89	Doped Silicon	7440-21-3 Total	% of 10tal Weight 100 100.00	
Compliance with the above EU Directives has been verified via interna	l design controls, su	plier declarations, and /or analytical test data.	oHS Recast Dire		, ,	1.22		7440-21-3	100	0.86
Compliance with the above EU Directives has been verified via internal of a chemical substance is absent from the list above, the chemical sub- ncorporated's knowledge and belief as of the date of this document, to s not below the threshold of regulatory concern for any regulatory scl	ostance is NOT an int here is no credible re	entional ingredient in the semiconductor device a	nd, to the best of	ctive) and with	h EU Directive		Doped Silicon	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.86
f a chemical substance is absent from the list above, the chemical sub ncorporated's knowledge and belief as of the date of this document, t	ostance is NOT an int here is no credible re heme world-wide. y standard for plastic	entional ingredient in the semiconductor device an ason to believe that the unavoidable impurity conductor to be a semiconductor device and the semiconductor dev	nd, to the best of centration of the	ctive) and with	h EU Directive		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	0.86
f a chemical substance is absent from the list above, the chemical sub ncorporated's knowledge and belief as of the date of this document, t s not below the threshold of regulatory concern for any regulatory scl Molding compounds used by Microchip meet the UL94 VO flammability	ostance is NOT an int here is no credible re heme world-wide. y standard for plastic	entional ingredient in the semiconductor device at ason to believe that the unavoidable impurity conductors. Some series of the UL iQTM family of databases.	nd, to the best of centration of the es to obtain a test	ctive) and with	h EU Directive		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond 7440-57-5	100 100.00 % of Total Weight	0.86
f a chemical substance is absent from the list above, the chemical sub ncorporated's knowledge and belief as of the date of this document, t s not below the threshold of regulatory concern for any regulatory scl Molding compounds used by Microchip meet the UL94 VO flammability http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are ma	ostance is NOT an int here is no credible re heme world-wide. y standard for plastic in adde from polyvinyl charm rm concerning subst owledge and belief, a ompiled based on the me information may be average weight of i	entional ingredient in the semiconductor device an ason to believe that the unavoidable impurity constants. You can access the UL iQTM family of database loride (PVC) plastic. "Window envelopes" used to ances restricted by RoHS in Microchip Technology is of the date listed in this form. Microchip Technology as of the date listed in this form. Microchip Technology is many provided in Material Safety Data Sheets prot have been provided by subcontract assembler anticipated significant toxic metals components. T	nd, to the best of centration of the is to obtain a test hold the packing y Incorporated's logy Incorporate rovided by raw n rs and raw mater	of Microchip Te chemical sub treport at g slip on the c semiconducted cannot gual naterial suppli	ch EU Directive echnology stance, if any, outer box and or devices in rantee the iers. Supplier information is	1.22	Doped Silicon (mg) Total Doped Gold	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external	100 100.00 % of Total Weight 100.00	
f a chemical substance is absent from the list above, the chemical sub ncorporated's knowledge and belief as of the date of this document, to so not below the threshold of regulatory concern for any regulatory scl Wolding compounds used by Microchip meet the UL94 V0 flammability nttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/The protective "tubes" in which the specific product is shipped are materialn "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this for heir original packing materials is true and correct to the best of its known pleteness and accuracy of data in this form because it has been completeness and soften protected from disclosure as trade secrets and so provided only as estimates of the average weight of these parts and the	ostance is NOT an inthere is no credible reheme world-wide. y standard for plastic ade from polyvinyl charm concerning substowledge and belief, a compiled based on the me information may be average weight of a levices (silicon IC) in oppress or implied, with operation of the property	entional ingredient in the semiconductor device at ason to believe that the unavoidable impurity constants. S. You can access the UL iQTM family of database: loride (PVC) plastic. "Window envelopes" used to ances restricted by RoHS in Microchip Technology sof the date listed in this form. Microchip Technology is of the date listed in this form. Microchip Technology is not have been provided in Material Safety Data Sheets provided have been provided in this form. The finished parts. The finished parts.	nd, to the best of centration of the sto obtain a test of hold the packing by Incorporated's logy Incorporate provided by raw in stand raw mater These estimates of a ration. The exclusion of the centration.	f Microchip Te chemical sub t report at g slip on the c semiconduct d cannot gual naterial suppli ial suppliers. do not include	ch EU Directive echnology stance, if any, buter box and or devices in rantee the iers. Supplier information is trace levels	1.22	Doped Silicon (mg) Total Doped Gold (mg) Total	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins)	100 100.00 % of Total Weight 100.00 100.00 % of Total Weight	
f a chemical substance is absent from the list above, the chemical sub ncorporated's knowledge and belief as of the date of this document, to so not below the threshold of regulatory concern for any regulatory scl Wolding compounds used by Microchip meet the UL94 V0 flammability nttp://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/The protective "tubes" in which the specific product is shipped are material "reels" may be made from PVC plastic. Wicrochip Technology Incorporated believes the information in this for heir original packing materials is true and correct to the best of its known pleteness and accuracy of data in this form because it has been conformation is often protected from disclosure as trade secrets and so provided only as estimates of the average weight of these parts and the of dopants, metals, and non-metal materials contained within silicon of Microchip Technology Incorporated does not provide any warranty, exwarranties provided by Microchip Technology Incorporated and its sul	ostance is NOT an inthere is no credible reheme world-wide. y standard for plastic ade from polyvinyl charmonic substowledge and belief, a ompiled based on the me information may be average weight of elevices (silicon IC) in the press or implied, with bidiaries are contain.	entional ingredient in the semiconductor device at ason to believe that the unavoidable impurity constants. You can access the UL iQTM family of database: loride (PVC) plastic. "Window envelopes" used to ances restricted by RoHS in Microchip Technology so of the date listed in this form. Microchip Technology and the date listed in this form. Microchip Technology are anges provided in Material Safety Data Sheets pinot have been provided by subcontract assembler anticipated significant toxic metals components. The finished parts. The respect to the information provided in this declated in Microchip's standard terms and conditions of clarations and shall not be liable for any damages, clarations and shall not be liable for any damages.	nd, to the best of centration of the es to obtain a test o hold the packing y Incorporated's logy Incorporate rovided by raw n rs and raw mater These estimates of arration. The exclu of sale. These arra	f Microchip Te chemical sub t report at g slip on the c semiconduct d cannot gual naterial suppli ial suppliers. do not include usive, limited p e provided in	ch EU Directive echnology stance, if any, outer box and or devices in rantee the information is trace levels orroduct Microchip's	1.22	Doped Silicon (mg) Total Doped Gold (mg) Total Tin	7440-21-3 Total Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-31-5	100 100.00 % of Total Weight 100.00 100.00 % of Total Weight	

B1KE 48 TFBGA 11:19 AM : 8/29/2013

AICROCHIP Semiconductor Device T	vpe: TL 124 (1.e	ad) VTLA 9x9x0.9mm (8S)		ation Base A oper Alloy (Co				ogeneous Materials: .g. pc boards, displays)		JEDEC 97 Product Marking and/or Pkg. Labeling e4
Connecting and a second contract of the secon	ypo. 12 124 (20	"Contained In"	% Total	1						
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	141.65	(mg) Total	Mold Compound	% ot Total Weigh	t 79.8
Silica, vitreous (or fused)	60676-86-0	Mold Compound	67.830	120.398	678,300		Silica, vitreous (or fused)	60676-86-0	85.00	7
Epoxy Resin	Trade Secret	Mold Compound	6.943	12.323	69,426		Epoxy Resin	Trade Secret	8.70	
Phenolic Resin	Trade Secret	Mold Compound	4.788	8.499	47,880		Phenolic Resin	Trade Secret	6.00	1
Carbon Black	1333-86-4	Mold Compound	0.239	0.425	2.394		Carbon Black	1333-86-4	0.30	1
Copper	7440-50-8	Lead Frame	10.217	18,134	102,165			Total	100.00	<u> </u>
Iron	7439-89-6	Lead Frame	0.242	0.429	2.415	18.64	(mg) Total	Lead Frame	% of Total Weigh	t 10.5
Phosphorous	7723-14-0	Lead Frame	0.026	0.047	263	10.04	Copper	7440-50-8	97.30	10.0
Zinc (Metal)	7440-44-0	Lead Frame	0.016	0.028	158		Iron	7439-89-6	2.30	1
Silver (Ag)	7440-22-4	Die Attach	0.589	1.045	5.888		Phosphorous	7723-14-0	0.25	1
Proprietary Resin	Trade Secret	Die Attach	0.139	0.246	1,388		Zinc (Metal)	7440-44-0	0.15	1
Proprietary Curing agent & Hardener	Trade Secret	Die Attach	0.023	0.040	225		Ziric (ivietal)	Total	100.00	-
Silicon	7440-21-3	Chip (Die)	7.500	13.313	75.000	4.00	(\ T-4-1			
					- /	1.33	(mg) Total	Die Attach	% of Total Weigh	t 0.75
Gold	7440-57-5	Wire Bond	0.200	0.355	2,000		Silver (Ag)	7440-22-4	79	
Nickel	7440-02-0	Plating on external leads (pins) / annealed at 150°C for 1 hour	1.125	1.997	11,250		Proprietary Resin	Trade Secret	19	
Palladium	7440-05-03	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.111	625	Proprieta	ary Curing agent & Hardener		3	
Gold	7440-57-5	Plating on external leads (pins) / annealed at 150°C for 1 hour	0.063	0.111	625			Total	100.00	
		TOTALS:	100.000	177.500	1,000,000	13.31	Total (mg)	Chip (Die)	% of Total Weigh	t 7.5
	0.1775	g Total Mass					Doped Silicon	7440-21-3	100	
	ical substance is NOT ment, there is no cred	an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity conce				0.36	(mg) Total Doped Gold	Wire Bond 7440-57-5	% of Total Weigh	t 0.2
• • •	mability standard for p	plastics. You can access the UL iQTM family of databases	to obtain a test	report at				Total	100.00	<u> </u>
otective "tubes" in which the specific product is shipped "reels" may be made from PVC plastic.	l are made from polyvi	nyl chloride (PVC) plastic. "Window envelopes" used to h	old the packing	ງ slip on the oເ	iter box and	2.22	(mg) Total	Plating on external leads (pins) / annealed at 150°C for 1 hour	% of Total Weigh	t 1.25
iginal packing materials is true and correct to the best of teness and accuracy of data in this form because it has ation is often protected from disclosure as trade secrets	of its knowledge and be been compiled based and some information and the average weig	substances restricted by RoHS in Microchip Technology I elief, as of the date listed in this form. Microchip Technolo on the ranges provided in Material Safety Data Sheets pro may not have been provided by subcontract assemblers ht of anticipated significant toxic metals components. The IC) in the finished parts.	gy Incorporated vided by raw mand raw materi	d cannot guara aterial supplic al suppliers. Ir	intee the rs. Supplier iformation is		Nickel	7440-02-0	90.00	
		d, with respect to the information provided in this declara ontained in Microchip's standard terms and conditions of					Palladium	7440-05-3	5.00	
		nt Declarations and shall not be liable for any damages, d Iformation in Material Content Declarations (MCD) or inde					Gold	7440-57-5	5.00	
								Total	100.00	- 1

TL 124 VTLA 11:19 AM : 8/29/2013

Semiconductor Device Type:	129 TFBGA 7	7x7x1.0 (GW)		nination Base Copper Alloy (Package Homoge 8.1 Electronics (e.g. p			JEDEC 97 Product Marking and/or Pkg. Labeling e1
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	ma de aut		51.44	(mg) Total	Mold Compound	% ot Total Weight	46.34
Silica, vitreous (or fused)	60676-86-0	Mold Compound	41.567	mg/part 46.139	ppm 415.670		Silica, vitreous (or fused)	60676-86-0	89.70	
Epoxy Resin	Trade Secret	Mold Compound	2.549	2.829	25,487		Epoxy Resin	Trade Secret	5.50	
Phenolic Resin	Trade Secret	Mold Compound	2.085	2.315	20,853		Phenolic Resin	Trade Secret	4.50	
Carbon Black	1333-86-4	Mold Compound	0.139	0.154	1,390		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	13.175	14.625	131,753			Total		
Glass fibers	65997-17-3	Lead Frame	7.854	8.718	78,538	40.74	(mg) Total	Lead Frame	% of Total Weight	36.7
Phenol, formaldehyde, (chloromethyl)oxirane polymer Silica, chemically prepared	9003-36-5 7631-86-9	Lead Frame Lead Frame	7.854 2.936	8.718 3.259	78,538 29,360		Copper Glass fibers	7440-50-8 65997-17-3	35.90 21.40	
Nickel	7440-02-0	Lead Frame	1.431	1.589	14.313		Glass fibers	9003-36-5	21.40	
Barite	7727-43-7	Lead Frame	0.918	1.018	9,175		Phenol, formaldahyde, (chloromethyl)colrane polymer Silica, chemically prepared	7631-86-9	8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.734	0.815	7.340		Nickel	7440-02-0	3.90	
Araldite GY 250	25068-38-6	Lead Frame	0.734	0.815	7,340		Barite	7727-43-7	2.50	
(2-Methoxymethylethoxy)propanol	34590-94-8	Lead Frame	0.294	0.326	2,936		Magnesium silicate	14807-96-6	2.00	
Misc.	system	Lead Frame	0.551	0.611	5,505		Araldite GY 250	25068-38-6	2.00	
Aluminium-hydroxide-oxide	24623-77-6	Lead Frame	0.184	0.204	1,835	(2-Met	hoxymethylethoxy)propanol	34590-94-8	0.80	
Gold	7440-57-5	Lead Frame	0.037	0.041	367		Misc.	system	1.50	
Silica, vitreous (or fused)	60676-86-0	Die Attach	0.280	0.311	2,800		Aluminium-hydroxide-oxide	24623-77-6	0.50	
Epoxy/Acrylic	Trade Secret	Die Attach	0.070	0.078	700		Gold	7440-57-5	0.10	
Silicon	7440-21-3	Chip (Die)	3.490	3.874	34,900			Total		
Copper	7440-50-8	Wire Bond	0.934	1.037	9,341	0.39	(mg) Total	Die Attach	% of Total Weight	0.35
Palladium	7440-05-3	Wire Bond	0.026	0.029	259		Silica, vitreous (or fused)	60676-86-0	80.00	
Tin	7440-31-5	Plating on external leads (pins)	11.734	13.025	117,344		Epoxy/Acrylic	Trade Secret	20.00	
Silver	7440-22-4	Plating on external leads (pins)	0.365	0.405	3,648			Total	100.00	
Silver Copper semiconductor device and its homogenous materials comply	7440-22-4 7440-50-8 0.111 with EU Directive	Plating on external leads (pins) Plating on external leads (pins) TOTALS: g Total Mass	0.365 0.061 100.000	0.405 0.067 111.000	3,648 608 1,000,000	3.87	Epoxy/Acrylic (mq) Total Doped Silicon (mq) Total		100.00 % of Total Weight 100 100.00	3.49
Silver Copper semiconductor device and its homogenous materials complytive) and with EU Directive 2002/53/EC (End-of-Life Vehicles pliance with the above EU Directives has been verified via int	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive).	Plating on external leads (pins) Plating on external leads (pins) TOTALS: g Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana	0.365 0.061 100.000 ctive 2011/65/	0.405 0.067 111.000 /EU (RoHS Re	3,648 608 1,000,000		(mg) Total Doped Silicon	Total Chip (Die) 7440-21-3 Total	100.00 % of Total Weight	
Silver Copper semiconductor device and its homogenous materials comply tive) and with EU Directive 2002/53/EC (End-of-Life Vehicles	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive). ernal design control I substance is NOThe date of this doc	Plating on external leads (pins) Plating on external leads (pins) TOTALS: g Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana T an intentional ingredient in the semicument, there is no credible reason to	0.365 0.061 100.000 ctive 2011/65/ lytical test date	0.405 0.067 111.000 /EU (RoHS Re ta. vice and, to the	3,648 608 1,000,000 cast		(mg) Total Doped Silicon (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8	100.00 % of Total Weight 100 100.00 % of Total Weight 97.30 2.70	
Silver Copper semiconductor device and its homogenous materials comply tive) and with EU Directive 2002/53/EC (End-of-Life Vehicles pliance with the above EU Directives has been verified via int hemical substance is absent from the list above, the chemica ochip Technology Incorporated's knowledge and belief as of t entration of the chemical substance, if any, is not below the t ing compounds used by Microchip meet the UL94 V0 flamma rt at http://ul.com/global/eng/pages/offerings/industries/chem	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive). ernal design control al substance is NOT the date of this doc hreshold of regula bility standard for icals/plastics/	Plating on external leads (pins) Plating on external leads (pins) TOTALS: g Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana T an intentional ingredient in the semicument, there is no credible reason to tory concern for any regulatory schen plastics. You can access the UL iQTM	0.365 0.061 100.000 ctive 2011/65/ lytical test dar conductor develeieve that the world-wide	0.405 0.067 111.000 /EU (ROHS Re tta. vice and, to the unavoidable.	3,648 608 1,000,000 cast e best of e impurity		(mg) Total Doped Silicon (mg) Total Copper	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3	100.00 % of Total Weight 100 100.00 % of Total Weight 97.30 2.70	
Silver Copper semiconductor device and its homogenous materials comply stive) and with EU Directive 2002/53/EC (End-of-Life Vehicles pliance with the above EU Directives has been verified via int hemical substance is absent from the list above, the chemica ochip Technology Incorporated's knowledge and belief as of entration of the chemical substance, if any, is not below the t ing compounds used by Microchip meet the UL94 V0 flamma	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive). ernal design control al substance is NO1 the date of this dochreshold of regular bility standard for icals/plastics/ e made from polyve	Plating on external leads (pins) Plating on external leads (pins) TOTALS: g Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana T an intentional ingredient in the semicument, there is no credible reason to tory concern for any regulatory schen plastics. You can access the UL iQTM	0.365 0.061 100.000 ctive 2011/65/ lytical test dar conductor develeieve that the world-wide	0.405 0.067 111.000 /EU (ROHS Re tta. vice and, to the unavoidable.	3,648 608 1,000,000 cast e best of e impurity		(mg) Total Doped Silicon (mg) Total Copper	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8	100.00 % of Total Weight 100 100.00 % of Total Weight 97.30 2.70	
Silver Copper semiconductor device and its homogenous materials comply stive) and with EU Directive 2002/53/EC (End-of-Life Vehicles pliance with the above EU Directives has been verified via int hemical substance is absent from the list above, the chemica ochip Technology Incorporated's knowledge and belief as of entration of the chemical substance, if any, is not below the t ing compounds used by Microchip meet the UL94 V0 flamma rt at http://ul.com/global/eng/pages/offerings/industries/chem protective "tubes" in which the specific product is shipped ar	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive). ernal design contr Il substance is NOThe date of this dochreshold of regula billity standard for icals/plastics/ e made from polyvic. is form concerning and correct to the blaccuracy of data iupplier information material suppliers.	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) TOTALS: q Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana T an intentional ingredient in the semicument, there is no credible reason to tory concern for any regulatory schen plastics. You can access the UL iQTM rinyl chloride (PVC) plastic. "Window exity of the work of the	0.365 0.061 100.000 ctive 2011/65/ lytical test dar conductor devibelieve that the world-wide family of data envelopes" us crochip Techt the date listed illed based on a trade secreta ates of the ave	0.405 0.067 111.000 /EU (RoHS Re ta. vice and, to the unavoidable and the unavoidab	ain a test e packing slip orated's Microchip rovided in formation of these parts	1.07	(mg) Total Doped Silicon (mg) Total Copper Palladium	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total	## 100.00 ## of Total Weight 100 ## of Total Weight 97.30 2.70 100.00	0.96
Silver Copper Semiconductor device and its homogenous materials comply stive) and with EU Directive 2002/53/EC (End-of-Life Vehicles pliance with the above EU Directives has been verified via int hemical substance is absent from the list above, the chemica schip Technology Incorporated's knowledge and belief as of o entration of the chemical substance, if any, is not below the t ing compounds used by Microchip meet the UL94 V0 flamma rt at http://ul.com/global/eng/pages/offerings/industries/chem protective "tubes" in which the specific product is shipped ar the outer box and certain "reels" may be made from PVC plast sochip Technology Incorporated believes the information in the conductor devices in their original packing materials is true a nology Incorporated cannot guarantee the completeness and rial Safety Data Sheets provided by raw material suppliers. S not have been provided by subcontract assemblers and raw the average weight of anticipated significant toxic metals con	7440-22-4 7440-50-8 0.111 with EU Directive (ELV) Directive). ernal design contr il substance is NO1 the date of this doc threshold of regular bility standard for icals/plastics/ e made from polyvic. is form concerning and correct to the baccuracy of data is upplier information material suppliers. and apponents. These es and parts. y, express or impli proprated and its s	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) TOTALS: q Total Mass 2002/95/EC (RoHS Directive), EU Dire ols, supplier declarations, and /or ana T an intentional ingredient in the semicument, there is no credible reason to tory concern for any regulatory schen plastics. You can access the UL iQTM rinyl chloride (PVC) plastic. "Window e g substances restricted by RoHS in Minest of its knowledge and belief, as of in this form because it has been comp in is often protected from disclosure as Information is provided only as estim stimates do not include trace levels of ied, with respect to the information pro- subsidiaries are contained in Microchip	0.365 0.061 100.000 ctive 2011/65/ lytical test data conductor devibelieve that the world-wide family of data envelopes" us crochip Techniche date lister illed based on trade secret adopants, met	0.405 0.067 111.000 /EU (RoHS Re ta. vice and, to the unavoidable) abases to obta sed to hold the unavoidable of the unavoid	a,648 608 1,000,000 cast e best of e impurity ain a test e packing slip orated's Microchip rovided in formation of these parts netal	1.07	(mg) Total Doped Silicon (mg) Total Copper Palladium (mg) Total	Total Chip (Die) 7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total Plating on external leads (pins)	100.00 % of Total Weight 100 100.00 % of Total Weight 97.30 2.70 100.00 % of Total Weight	0.96

129 TFBGA 11:19 AM : 8/29/2013

Semiconductor Device Type:	D2KE 40 TED	20.00.000.000		ination Base opper Alloy	•		•	geneous Materials: g. pc boards, display	/s)	JEDEC 97 Product Markin and/or Pkg. Labeling e1
Semiconductor Device Type:	B3KE 48 IFBO	, ,								01
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	47.33	(mg) Total	Mold Compound	% ot Total Weight	50.3
FUSED SILICA	60676-86-0	Mold Compound	38.981	36.681	389,810		FUSED SILICA	60676-86-0	77.50	
EPOXY RESINS, CURED	Trade Secret	Mold Compound	4.905	4.615	49,048	1	EPOXY RESINS, CURED	Trade Secret	9.75	
CROSS-LINKED HIGH MOLECULAR EPOXY / EPOXY PHENOL RESIN	Trade Secret	Mold Compound	4.905	4.615	49,048	MOLECULAR E	POXY / EPOXY PHENOL RESIN	Trade Secret	9.75	
CRYSTALLINE SILICA	14808-60-7	Mold Compound	1.258	1.184	12,580		CRYSTALLINE SILICA	14808-60-7	2.50	
CARBON BLACK	1333-86-4	Mold Compound	0.252	0.237	2,515	4	CARBON BLACK	1333-86-4	0.50	
Copper	7440-50-8	Lead Frame	8.052	7.577	80,524			Total		
Glass fibers	65997-17-3	Lead Frame	4.800	4.517	48,000	21.11	(mg) Total	Lead Frame	% of Total Weight	22.43
Phenol, formaldehyde, (chloromethyl)oxirane polymer	9003-36-5	Lead Frame	4.800	4.517	48,000	_	Copper	7440-50-8	35.90	
Silica, chemically prepared	7631-86-9	Lead Frame	1.794	1.689	17,944	4	Glass fibers	65997-17-3	21.40	
Nickel	7440-02-0	Lead Frame	0.875	0.823	8,748	4	Phenol, polymer	9003-36-5	21.40	
Barite	7727-43-7	Lead Frame	0.561	0.528	5,608	4	Silica, chemically prepared	7631-86-9	8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.449	0.422	4,486	4	Nickel	7440-02-0	3.90	
Araldite GY 250	25068-38-6	Lead Frame	0.449	0.422	4,486	4	Barite	7727-43-7	2.50	
(2-Methoxymethylethoxy)propanol Misc	34590-94-8 system	Lead Frame Lead Frame	0.179 0.336	0.169 0.317	1,794 3.365	-	Magnesium silicate Araldite GY 250	14807-96-6 25068-38-6	2.00	
1111001	24623-77-6	Lead Frame Lead Frame	0.336	0.317		(0.14.4)		25068-38-6 34590-94-8	0.80	
Aluminium-hydroxide-oxide Gold	7440-57-5	Lead Frame	0.112	0.106	1,122 224	(Z-IVIETI	noxymethylethoxy)propanol Misc.	system	1.50	
Silver	7440-37-3	Die Attach	0.552	0.519	5.520	-	Aluminium-hydroxide-oxide	24623-77-6	0.50	
asic Duromer:Phenolic resin (Compound of polymeric network)	26834-02-6	Die Attach	0.138	0.130	1,380	1	Gold	7440-57-5	0.10	
Silicon	7440-21-3	Chip (Die)	7.650	7.199	76,500	1	Cold	Total		
Doped Gold	7440-57-5	Wire Bond	0.860	0.809	8,600	0.65	(mg) Total	Die Attach	% of Total Weight	0.69
Tin	7440-31-5	Plating on external leads (pins)	17.257	16.239	172.569	0.05	Silver	7440-22-4	80.00	0.09
Silver	7440-31-3	Plating on external leads (pins)	0.723	0.680	7,228	-	Phenolic resin	26834-02-6	20.00	
Copper	7440-50-8	Plating on external leads (pins)	0.090	0.085	904	-	Filefiolic resili	Total		
Обррег	1440 00 0	TOTA		94.100	1.000.000	7.20	(mg) Total	Chip (Die)	% of Total Weight	7.65
	0.0044 - T		100.000	34.100	1,000,000	7.20			100	7.00
emiconductor device and its homogenous materials comply with	0.0941 g To th EU Directive 2002/95		RoHS Recast Dire	otivo) and wi	4h E11	1	Doped Silicon	7440-21-3	100	
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).				ctive) and wi	in EU	0.91	(mg) Total	Wire Rond	% of Total Weight	0.86
				ctive) and wi	in EU	0.81	(mg) Total	Wire Bond	% of Total Weight	0.86
iance with the above EU Directives has been verified via intern	aı uesiyii controls, sup	plier declarations, and /or analytical test data.		ctive) and wi	in EO	0.81	(mg) Total Doped Gold	7440-57-5	100.00	0.86
emical substance is absent from the list above, the chemical su orated's knowledge and belief as of the date of this document,	ubstance is NOT an inte	entional ingredient in the semiconductor device a son to believe that the unavoidable impurity cor		f Microchip T	echnology	0.81			100.00	0.86
emical substance is absent from the list above, the chemical su orated's knowledge and belief as of the date of this document, not below the threshold of regulatory concern for any regulato g compounds used by Microchip meet the UL94 V0 flammabilit	ubstance is NOT an inte there is no credible rea ory scheme world-wide ty standard for plastics	entional ingredient in the semiconductor device a son to believe that the unavoidable impurity cor	ncentration of the	f Microchip T chemical sul	echnology	17.00		7440-57-5	100.00	18.07
olliance with the above EU Directives has been verified via internuemical substance is absent from the list above, the chemical strontard's knowledge and belief as of the date of this document, as not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammabilitul.com/global/eng/pages/offerings/industries/chemicals/plastics rotective "tubes" in which the specific product is shipped are mn "reels" may be made from PVC plastic.	ubstance is NOT an inte there is no credible rea bry scheme world-wide by standard for plastics	entional ingredient in the semiconductor device a son to believe that the unavoidable impurity cor You can access the UL iQTM family of database	ncentration of the	f Microchip T chemical sul t report at	echnology ostance, if		Doped Gold	7440-57-5 Total Plating on external	100.00	
emical substance is absent from the list above, the chemical suborated's knowledge and belief as of the date of this document, inct below the threshold of regulatory concern for any regulator geompounds used by Microchip meet the UL94 V0 flammabilit L.com/global/eng/pages/offerings/industries/chemicals/plastics otective "tubes" in which the specific product is shipped are man "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information in this for riginal packing materials is true and correct to the best of its kneteness and accuracy of data in this form because it has been valued in soften protected from disclosure as trade secrets and solded only as estimates of the average weight of these parts and	ubstance is NOT an interest in the correction of	entional ingredient in the semiconductor device a son to believe that the unavoidable impurity core. You can access the UL iQTM family of database oride (PVC) plastic. "Window envelopes" used to move restricted by RoHS in Microchip Technolog to fit the date listed in this form. Microchip Technolog is of the date listed in Material Safety Data Sheets to thave been provided by subcontract assemble anticipated significant toxic metals component:	ncentration of the es to obtain a tes o hold the packin yy Incorporated's provided by raw ers and raw mater	f Microchip T chemical sult report at g slip on the semiconducted cannot guamaterial suppiral suppiral suppilers.	echnology ostance, if outer box and or devices in trantee the liers. Supplier Information		Doped Gold (mg) Total	7440-57-5 Total Plating on external leads (pins)	100.00 100.00 % of Total Weight	
emical substance is absent from the list above, the chemical su orated's knowledge and belief as of the date of this document, s not below the threshold of regulatory concern for any regulator ng compounds used by Microchip meet the UL94 VO flammabilit ul.com/global/eng/pages/offerings/industries/chemicals/plastics rotective "tubes" in which the specific product is shipped are m	ubstance is NOT an interest in occidible ready scheme world-wide. The standard for plastics of the standard form polyvinyl chlorem concerning substance will be standard for the standard form polyvinyl chlorem concerning substance will be standard for the standard form of the sta	entional ingredient in the semiconductor device a son to believe that the unavoidable impurity corporate in the semiconductor device a son to believe that the unavoidable impurity corporate in the semiconductor of database or ide (PVC) plastic. "Window envelopes" used to nees restricted by RoHS in Microchip Technolog of the date listed in this form. Microchip Technolog are the semiconductor of the semicon	ncentration of the es to obtain a tes o hold the packing y Incorporated's ology Incorporate provided by raw i ers and raw mater s. These estimate aration. The exclu	f Microchip T chemical sult treport at g slip on the of semiconducted cannot guametrial suppliers, es do not inclusive, limited	echnology postance, if puter box and or devices in trantee the liers. Supplier Information ude trace product		Doped Gold (mg) Total Tin	7440-57-5 Total Plating on external leads (pins) 7440-31-5	100.00 100.00 % of Total Weight 95.50	

B3KE 48 TFBGA 11:19 AM : 8/29/2013

AICROCHIP Semiconductor Device	e Type: 25 VFBGA 3x3x0.8	mm (FE)		ination Base opper Alloy (geneous Materials: _J . pc boards, display	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e1
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	7.50	(mg) Total	Mold Compound	% ot Total Weight	46.875
fused silica	60676-86-0	Mold Compound	35,442	5.671	354,422		fused silica	60676-86-0	75.61	
solid epoxy resin	25068-38-6	Mold Compound	5.030	0.805	50,297		solid epoxy resin	25068-38-6	10.73	
phenol resin	108-95-2	Mold Compound	5.030	0.805	50,297		phenol resin	108-95-2	10.73	
Cristalline Silica carbon black	112945-52-5 1333-86-4	Mold Compound Mold Compound	1.144 0.230	0.183 0.037	11,438 2,297		Cristalline Silica carbon black	112945-52-5 1333-86-4	2.44 0.49	
Copper	7440-50-8	Lead Frame	10.321	1.651	103.213		Carbon black	1333-00-4 Tota		
Glass fibers	65997-17-3	Lead Frame	6.153	0.984	61,525	4.60	(mg) Total	Lead Frame	% of Total Weight	28.75
Phenol polymer	9003-36-5	Lead Frame	6.153	0.984	61,525		Copper	7440-50-8	35.90	
Silica, chemically prepared	7631-86-9	Lead Frame	2.300	0.368	23,000		Glass fibers	65997-17-3	21.40	
Nickel	7440-02-0	Lead Frame	1.121	0.179	11,213		Phenol polymer	9003-36-5	21.40	
Barite	7727-43-7	Lead Frame	0.719	0.115	7,188		Silica, chemically prepared	7631-86-9	8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.575	0.092	5,750		Nickel	7440-02-0	3.90	
Araldite GY 250 (2-Methoxymethylethoxy)propanol	25068-38-6 34590-94-8	Lead Frame Lead Frame	0.575 0.230	0.092 0.037	5,750 2,300		Barite Magnesium silicate	7727-43-7 14807-96-6	2.50 2.00	
Misc.	system	Lead Frame	0.431	0.069	4.313		Araldite GY 250	25068-38-6	2.00	
Aluminium-hydroxide-oxide	24623-77-6	Lead Frame	0.144	0.023	1,438	(2-Met	hoxymethylethoxy)propanol	34590-94-8	0.80	
Gold	7440-57-5	Lead Frame	0.029	0.005	288		Misc.	system	1.50	
Silver (Ag)	7440-22-4	Die Attach	0.905	0.145	9,050		Aluminium-hydroxide-oxide	24623-77-6	0.50	
Diester Resin Acrlate Resin	Trade Secret	Die Attach	0.226 0.085	0.036 0.014	2,263 849		Gold	7440-57-5 Tota	0.10 I 100.00	
Acriate Resin Polymeric Resin	Trade Secret Trade Secret	Die Attach Die Attach	0.085	0.014	339	0.20	(mg) Total	Die Attach	% of Total Weight	1.25
Silicon	7440-21-3	Chip (Die)	5.000	0.800	50.000		Silver (Ag)	7440-22-4	72.40	
Doped Gold	7440-21-3	Wire Bond	0.625	0.100	6,250		Diester Resin	Trade Secret	18.10	
Tin	7440-31-5								10.10	
		SAC 305 Solder Dall	16.888	2.702	168.875		Acriate Resin	Trade Secret	6.79	
Silver	7440-22-4	SAC 305 Solder ball SAC 305 Solder ball	16.888 0.525	2.702 0.084	168,875 5,250		Acrlate Resin Polymeric Resin	Trade Secret Trade Secret	6.79 2.71	
									2.71	
Silver	7440-22-4	SAC 305 Solder ball	0.525 0.088	0.084	5,250	0.80		Trade Secret	2.71	5
Silver	7440-22-4	SAC 305 Solder ball SAC 305 Solder ball TOTALS:	0.525 0.088	0.084 0.014	5,250 875	0.80	Polymeric Resin	Trade Secret Tota	2.71 I 100.00	5
Silver Copper semiconductor device and its homogenous materials c	7440-22-4 7440-50-8 0.0160 g Tot	SAC 305 Solder ball SAC 305 Solder ball TOTALS:	0.525 0.088 100.000	0.084 0.014 16.000	5,250 875 1,000,000	0.80	Polymeric Resin (mg) Total	Trade Secret Tota Chip (Die)	2.71 I 100.00 % of Total Weight	5
Silver Copper semiconductor device and its homogenous materials cutive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/E	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoH	0.525 0.088 100.000	0.084 0.014 16.000	5,250 875 1,000,000	0.80	Polymeric Resin (mg) Total	Trade Secret Tota Chip (Die) 7440-21-3	2.71 I 100.00 % of Total Weight	0.625
Silver Copper semiconductor device and its homogenous materials concive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). spliance with the above EU Directives has been verified with the above the spliance with	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/E via internal design controls, suppliemical substance is NOT an intent ocument, there is no credible reasc	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data.	0.525 0.088 100.000 S Recast Directo the best o	0.084 0.014 16.000 ective) and wit	5,250 875 1,000,000 h EU		Polymeric Resin (mg) Total Doped Silicon	Trade Secret Tota Chip (Die) 7440-21-3 Tota	2.71 I 100.00 % of Total Weight 100 I 100.00	-
Silver Copper s semiconductor device and its homogenous materials concive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified with the above EU Directives has been verified with the list above, the charporated's knowledge and belief as of the date of this definition is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 flat.	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/E- via internal design controls, suppli emical substance is NOT an intent ocument, there is no credible reasc y regulatory scheme world-wide. ammability standard for plastics. Y	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. ional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concent	0.525 0.088 100.000 S Recast Director to the best of t	0.084 0.014 16.000 ective) and with	5,250 875 1,000,000 h EU		Polymeric Resin (mg) Total Doped Silicon (mg) Total	Trade Secret Tota Chip (Die) 7440-21-3 Tota Wire Bond	2.71 100.00 % of Total Weight 100 0 100.00 % of Total Weight 100.00	-
Silver Copper semiconductor device and its homogenous materials of citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified of the compounds used by Microchip meet the UL94 V0 file is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 file://ul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is shipped.	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/E- via internal design controls, supplinemical substance is NOT an intent ocument, there is no credible reascy regulatory scheme world-wide. ammability standard for plastics. Y s/plastics/	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. ional ingredient in the semiconductor device and, on to believe that the unavoidable impurity concentual concentration of the con	0.525 0.088 100.000 S Recast Directo the best optration of the	0.084 0.014 16.000 ective) and with the chemical subtraport at	5,250 875 1,000,000 h EU		Polymeric Resin (mg) Total Doped Silicon (mg) Total	Trade Secret Tota Chip (Die) 7440-21-3 Tota Wire Bond 7440-57-5	2.71 100.00 % of Total Weight 100 0 100.00 % of Total Weight 100.00	-
Silver Copper s semiconductor device and its homogenous materials control of the	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/E via internal design controls, suppli emical substance is NOT an intent ocument, there is no credible reasc y regulatory scheme world-wide. ammability standard for plastics. Y s/plastics/ ped are made from polyvinyl chlori in in this form concerning substance st of its knowledge and belief, as o as been compiled based on the ra ets and some information may not parts and the average weight of a	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoHer declarations, and /or analytical test data. ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concent ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to hose restricted by RoHS in Microchip Technology In the date listed in this form. Microchip Technology nges provided in Material Safety Data Sheets prowave been provided by subcontract assemblers a nticipated significant toxic metals components. Ti	0.525 0.088 100.000 S Recast Director to the best of the the second tration of the composition of the compos	0.084 0.014 16.000 ective) and wit of Microchip Teachemical sub t report at g slip on the of semiconducted cannot guar material suppliers.	5,250 875 1,000,000 h EU schnology stance, if uter box and or devices in antee the iers. Supplier information	0.10	Polymeric Resin (mg) Total Doped Silicon (mg) Total Doped Gold	Trade Secret Tota Chip (Die) 7440-21-3 Tota Wire Bond 7440-57-5	2.71 100.00 % of Total Weight 100.00 % of Total Weight 100.00	0.625
Silver Copper s semiconductor device and its homogenous materials concive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified vechemical substance is absent from the list above, the charporated's knowledge and belief as of the date of this dot, is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 file of the date of this dot, is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 file of the date of this dot, is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 file of the protective "tubes" in which the specific product is shipp tain "reels" may be made from PVC plastic. Torchip Technology Incorporated believes the information roriginal packing materials is true and correct to the besupleteness and accuracy of data in this form because it humation is often protected from disclosure as trade secrovided only as estimates of the average weight of these less of dopants, metals, and non-metal materials contained rochip Technology Incorporated does not provide any we ranties provided by Microchip Technology Incorporated stations, sales order acknowledgement, and invoices.	0.0160 g Tot 0.0160 g Tot 0.0160 g Tot omply with EU Directive 2002/95/E via internal design controls, suppli memical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. ammability standard for plastics. Y is/plastics/ ped are made from polyvinyl chlori in in this form concerning substance st of its knowledge and belief, as o has been compiled based on the ra ets and some information may not be a divided to the rate of the complete of the rate of the complete of	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoH er declarations, and /or analytical test data. ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concent ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to ho es restricted by RoHS in Microchip Technology In f the date listed in this form. Microchip Technology in ges provided in Material Safety Data Sheets prov have been provided by subcontract assemblers a nticipated significant toxic metals components. The in the finished parts. spect to the information provided in this declarati in Microchip's standard terms and conditions of s	0.525 0.088 100.000 S Recast Director to the best operated in the packing of the	0.084 0.014 16.000 ective) and wit of Microchip Teachemical sub t report at g slip on the of semiconducted cannot guaramaterial suppliers. es do not inclusive, limited pre provided in	5,250 875 1,000,000 h EU schnology stance, if uter box and or devices in rantee the lers. Supplier Information de trace	0.10	Polymeric Resin (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	Trade Secret Tota Chip (Die) 7440-21-3 Tota Wire Bond 7440-57-5 Tota SAC 305 Solder ball	2.71 100.00 % of Total Weight 100 0 % of Total Weight 100.00 % of Total Weight 100.00 % of Total Weight	0.625
Silver Copper s semiconductor device and its homogenous materials of circtive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified with the above and belief as of the date of this down, is not below the threshold of regulatory concern for any ding compounds used by Microchip meet the UL94 V0 file:://ul.com/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is shipp ain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information or original packing materials is true and correct to the besupleteness and accuracy of data in this form because it homation is often protected from disclosure as trade secretive original packing materials of the average weight of these revision of oppants, metals, and non-metal materials contained trochip Technology Incorporated does not provide any waranties provided by Microchip Technology Incorporated	7440-22-4 7440-50-8 0.0160 g Tot omply with EU Directive 2002/95/Ei via internal design controls, suppli emical substance is NOT an intent ocument, there is no credible reaso y regulatory scheme world-wide. ammability standard for plastics. Y s/plastics/ ped are made from polyvinyl chlori in in this form concerning substance st of its knowledge and belief, as o nas been compiled based on the ra et and some information may not y parts and the average weight of a d within silicon devices (silicon IC) arranty, express or implied, with re and its subsidiaries are contained changes to Material Content Declar- te users' reliance on the informatic	SAC 305 Solder ball SAC 305 Solder ball TOTALS: al Mass C (RoHS Directive), EU Directive 2011/65/EU (RoH er declarations, and /or analytical test data. ional ingredient in the semiconductor device and, in to believe that the unavoidable impurity concen- ou can access the UL iQTM family of databases to de (PVC) plastic. "Window envelopes" used to ho es restricted by RoHS in Microchip Technology In the date listed in this form. Microchip Technology In the date listed in this form. Microchip Technology ges provided in Material Safety Data Sheets prov have been provided by subcontract assemblers a nticipated significant toxic metals components. Ti in the finished parts. spect to the information provided in this declarati in Microchip's standard terms and conditions of s ations and shall not be liable for any damages, dir	0.525 0.088 100.000 S Recast Director to the best of t	0.084 0.014 16.000 ective) and wit of Microchip Te chemical sub t report at g slip on the o semiconducte d cannot gual material suppliers. es do not inclu usive, limited p e provided in	5,250 875 1,000,000 h EU chnology stance, if uter box and or devices in antee the iers. Supplier information de trace oroduct Microchip's ial or	0.10	Polymeric Resin (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	Trade Secret Tota Chip (Die) 7440-21-3 Tota Wire Bond 7440-57-5 Tota SAC 305 Solder ball 7440-31-5	2.71 100.00 % of Total Weight 100 0 % of Total Weight 100.00 % of Total Weight 100.00 % of Total Weight 96.50	0.625

25 VFBGA 11:19 AM: 8/29/2013

MICROCHIP Semiconductor Device Typ	e: 129 TFBGA 7x7	x1.0 (GW)		ination Base opper Alloy				ogeneous Materials: g. pc boards, display	rs)	JEDEC 97 Product Marking and/or Pkg. Labeling e1
	1	"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	51.44	(mg) Total	Mold Compound	% ot Total Weight	46.34
Silica, vitreous (or fused)	60676-86-0	Mold Compound	41.567	46.139	415.670		Silica, vitreous (or fused)	60676-86-0	89.70	
Epoxy Resin	Trade Secret	Mold Compound	2.549	2.829	25,487		Epoxy Resin	Trade Secret	5.50	
Phenolic Resin	Trade Secret	Mold Compound	2.085	2.315	20,853		Phenolic Resin	Trade Secret	4.50	
Carbon Black	1333-86-4	Mold Compound	0.139	0.154	1,390		Carbon Black	1333-86-4	0.30	
Copper	7440-50-8	Lead Frame	13.175	14.625	131,753			Total	100.00	
Glass fibers	65997-17-3	Lead Frame	7.854	8.718	78,538	40.74	(mg) Total	Lead Frame	% of Total Weight	36.7
Phenol, formaldehyde, (chloromethyl)oxirane polymer	9003-36-5	Lead Frame	7.854	8.718	78,538		Copper	7440-50-8	35.90	
Silica, chemically prepared	7631-86-9	Lead Frame	2.936	3.259	29,360		Glass fibers	65997-17-3	21.40	
Nickel	7440-02-0	Lead Frame	1.431	1.589	14,313			0000 00 5	21.40	
Barite	7727-43-7	Lead Frame	0.918	1.018	9,175		de, (chloromethyl)oxirane polymer Silica, chemically prepared	9003-36-5 7631-86-9	21.40 8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.916	0.815	7,340	1 '	Silica, cnemically prepared Nickel	7631-86-9 7440-02-0	3.90	
Araldite GY 250	25068-38-6	Lead Frame	0.734	0.815	7,340		Rarite	7727-43-7	2.50	
(2-Methoxymethylethoxy)propanol	34590-94-8	Lead Frame	0.294	0.326	2,936		Magnesium silicate	14807-96-6	2.00	
Misc.	system	Lead Frame	0.551	0.611	5,505		Araldite GY 250	25068-38-6	2.00	
Aluminium-hydroxide-oxide	24623-77-6	Lead Frame	0.184	0.204	1,835	(2-Meth	oxymethylethoxy)propanol	34590-94-8	0.80	
Gold	7440-57-5	Lead Frame	0.037	0.041	367	1	Misc.	system	1.50	
Silica, vitreous (or fused)	60676-86-0	Die Attach	0.280	0.311	2,800	,	Aluminium-hydroxide-oxide	24623-77-6	0.50	
Epoxy/Acrylic	Trade Secret	Die Attach	0.070	0.078	700		Gold	7440-57-5	0.10	
Silicon	7440-21-3	Chip (Die)	3.490	3.874	34,900			Total	100.00	•'
Copper	7440-50-8	Wire Bond	0.934	1.037	9,341	0.39	(mg) Total	Die Attach	% of Total Weight	0.35
Palladium	7440-05-3	Wire Bond	0.026	0.029	259		Silica, vitreous (or fused)	60676-86-0	80.00	
Tin	7440-31-5	Plating on external leads (pins)	11.734	13.025	117,344		Epoxy/Acrylic	Trade Secret	20.00	
Silver	7440-22-4	Plating on external leads (pins)	0.365	0.405	3,648			Total	100.00	- · · · · · · · · · · · · · · · · · · ·
Copper	7440-50-8	Plating on external leads (pins)		0.067			(mg) Total			3.49
			0.061		608	3.87		Chip (Die)	% of Total Weight	3.49
		TOTALS		111.000	1,000,000	3.87	Doped Silicon	7440-21-3	% of Total Weight 100	3.49
	0.111 g 1					3.87				3.49
		TOTALS otal Mass	100.000	111.000	1,000,000	1.07		7440-21-3	100	0.96
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 2002/9	TOTALS Otal Mass S/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	100.000	111.000	1,000,000		Doped Silicon	7440-21-3 Total	100 100.00	
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via intended in the chemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume	with EU Directive 2002/9 ernal design controls, sul I substance is NOT an int nt, there is no credible re	TOTALS S/EC (RoHS Directive), EU Directive 2011/65/EU (Rol pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce	ds Recast Dire	111.000 ective) and with	1,000,000 th EU echnology		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond	100 100.00 % of Total Weight	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interpretable to the chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal	with EU Directive 2002/9 ernal design controls, sul I substance is NOT an ini nt, there is no credible re latory scheme world-wide bility standard for plastic:	TOTALS S/EC (RoHS Directive), EU Directive 2011/65/EU (Rol pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce	ds Recast Directly to the best on the stration of the	111.000 ective) and with	1,000,000 th EU echnology		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond 7440-50-8	100 100.00 % of Total Weight 97.30	
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). mpliance with the above EU Directives has been verified via into the chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal p://ul.com/global/eng/pages/offerings/industries/chemicals/plase e protective "tubes" in which the specific product is shipped ar	with EU Directive 2002/9 ernal design controls, sup- I substance is NOT an ini- nt, there is no credible re- latory scheme world-wide bility standard for plastic- tics/	TOTALS Fotal Mass S/EC (RoHS Directive), EU Directive 2011/65/EU (Roford (Ro	IS Recast Directly to the best on the best on the state of the second transfer of the secon	111.000 ective) and with the first section of the f	1,000,000 th EU echnology ostance, if		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond 7440-50-8 7440-05-3	100 100.00 % of Total Weight 97.30 2.70	
his semiconductor device and its homogenous materials comply rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). It is a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal tp://ul.com/global/eng/pages/offerings/industries/chemicals/plas he protective "tubes" in which the specific product is shipped ar train "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in this eir original packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be formation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts yels of dopants, metals, and non-metal materials contained with	with EU Directive 2002/9 ernal design controls, sup I substance is NOT an int nt, there is no credible re latory scheme world-wide bility standard for plastications e made from polyvinyl ch s form concerning substance s knowledge and belief, a en compiled based on the d some information may and the average weight of	TOTALS Total Mass 5/EC (RoHS Directive), EU Directive 2011/65/EU (Rol pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce. b. You can access the UL iQTM family of databases in loride (PVC) plastic. "Window envelopes" used to he conces restricted by RoHS in Microchip Technology is s of the date listed in this form. Microchip Technology is s of the date listed in Material Safety Data Sheets pro not have been provided by subcontract assemblers of anticipated significant toxic metals components. 1	Is Recast Direction of the contration of the con	attive) and with the chemical substitution of the chemical substitution of the chemical supportal supporta	1,000,000 th EU echnology stance, if outer box and or devices in rantee the liers. Supplier Information	1.07	Doped Silicon (mg) Total Copper Palladium	7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total Plating on external	100 100.00 % of Total Weight 97.30 2.70	0.96
rective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via into a chemical substance is absent from the list above, the chemical corporated's knowledge and belief as of the date of this docume y, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal p://ul.com/global/eng/pages/offerings/industries/chemicals/plase e protective "tubes" in which the specific product is shipped arratain "reels" may be made from PVC plastic. Crochip Technology Incorporated believes the information in this irroriginal packing materials is true and correct to the best of it impleteness and accuracy of data in this form because it has be ormation is often protected from disclosure as trade secrets an provided only as estimates of the average weight of these parts	with EU Directive 2002/9 ernal design controls, sup- I substance is NOT an int, there is no credible re- latory scheme world-wide bility standard for plastications, e made from polyvinyl chastications, s form concerning substances is knowledge and belief, and some information may and the average weight in silicon devices (silicon y, express or implied, wit	TOTALS Total Mass S/EC (RoHS Directive), EU Directive 2011/65/EU (Rol pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce b. You can access the UL iQTM family of databases in loride (PVC) plastic. "Window envelopes" used to he unces restricted by RoHS in Microchip Technology in s of the date listed in this form. Microchip Technology in s of the date listed in Material Safety Data Sheets pro onthe have been provided by subcontract assemblers of anticipated significant toxic metals components. To IC) in the finished parts.	Is Recast Directly to the best of the best	attive) and with the sective of Microchip Tourish the section of t	1,000,000 th EU echnology stance, if outer box and or devices in rantee the liers. Supplier Information ude trace	1.07	Doped Silicon (mg) Total Copper Palladium (mg) Total	7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total Plating on external leads (pins)	100 100.00 % of Total Weight 97.30 2.70 100.00 % of Total Weight	0.96
ective 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via into chemical substance is absent from the list above, the chemical properties of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal cylu.com/global/eng/pages/offerings/industries/chemicals/plast protective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic. Trochip Technology Incorporated believes the information in this ir original packing materials is true and correct to the best of it in pleteness and accuracy of data in this form because it has be immation is often protected from disclosure as trade secrets an orovided only as estimates of the average weight of these parts als of dopants, metals, and non-metal materials contained with prochip Technology Incorporated does not provide any warrant tranties provided by Microchip Technology Incorporated and its	with EU Directive 2002/9 ernal design controls, supernal design contro	TOTALS Total Mass S/EC (RoHS Directive), EU Directive 2011/65/EU (Rol pplier declarations, and /or analytical test data. entional ingredient in the semiconductor device and ason to believe that the unavoidable impurity conce. b. You can access the UL iQTM family of databases in loride (PVC) plastic. "Window envelopes" used to he unces restricted by RoHS in Microchip Technology is sof the date listed in this form. Microchip Technology is of the date listed in Material Safety Data Sheets pro of anticipated significant toxic metals components. To IC) in the finished parts. In respect to the information provided in this declara ed in Microchip's standard terms and conditions of larations and shall not be liable for any damages, di	Is Recast Directory of the best of the packing obtain a test of the packing of th	attive) and with the control of Microchip To chemical subtract to the control of	ath EU echnology ostance, if outer box and or devices in rantee the liers. Supplier Information ude trace product Microchip's tial or	1.07	Doped Silicon (mg) Total Copper Palladium (mg) Total Tin	7440-21-3 Total Wire Bond 7440-50-8 7440-05-3 Total Plating on external leads (pins)	100 100.00 % of Total Weight 97.30 2.70 100.00 % of Total Weight	0.96

APK 11:20 AM : 8/29/2013

AICROCHIP Semiconductor Device Typ	e: MAQE 48 WFE	3GA 4x6x0.8mm (3T)		ination Base opper Alloy (Package Homogeneou Electronics (e.g. pc be			JEDEC 97 Product Marking and/or Pkg. Labeling e1
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	14.50	(mg) Total	Mold Compound	% ot Total Weight	50.51
FUSED SILICA	60676-86-0	Mold Compound	39.144	11,234	391,437		FUSED SILICA	60676-86-0	77.50	1
EPOXY RESINS, CURED	Trade Secret	Mold Compound	4,925	1,414	49,252	1	EPOXY RESINS, CURED	Trade Secret	9.75	1
HIGH MOLECULAR EPOXY / EPOXY PHENOL RESIN	Trade Secret	Mold Compound	4.925	1.414	49,252	HIGH MOLECULAR EPOXY		Trade Secret	9.75	1
CRYSTALLINE SILICA	14808-60-7	Mold Compound	1.263	0.363	12,633		CRYSTALLINE SILICA	14808-60-7	2.50	
CARBON BLACK	1333-86-4	Mold Compound	0.253	0.072	2,526		CARBON BLACK	1333-86-4	0.50]
Copper	7440-50-8	Lead Frame	8.616	2.473	86,160			Total		
Glass fibers	65997-17-3	Lead Frame	5.136	1.474 1.474	51,360	6.89	(mg) Total	Lead Frame	% of Total Weight	24
Phenol, formaldehyde, (chloromethyl)oxirane polymer	9003-36-5 7631-86-9	Lead Frame Lead Frame	5.136 1.920	0.551	51,360	1	Copper Glass fibers	7440-50-8 65997-17-3	35.90 21.40	
Silica, chemically prepared Nickel	7440-02-0	Lead Frame	0.936	0.551	19,200 9,360	Phenol, formaldehyde, (chl		9003-36-5	21.40	1
Barite	7727-43-7	Lead Frame	0.600	0.172	6,000		Silica, chemically prepared	7631-86-9	8.00	
Magnesium silicate	14807-96-6	Lead Frame	0.480	0.172	4,800	i	Nickel	7440-02-0	3.90	1
Araldite GY 250	25068-38-6	Lead Frame	0.480	0.138	4,800	1	Barite	7727-43-7	2.50	1
(2-Methoxymethylethoxy)propanol	34590-94-8	Lead Frame	0.192	0.055	1,920	1	Magnesium silicate	14807-96-6	2.00	1
Misc.	system	Lead Frame	0.360	0.103	3,600]	Araldite GY 250	25068-38-6	2.00	1
Aluminium-hydroxide-oxide	24623-77-6	Lead Frame	0.120	0.034	1,200	(2-Meth	oxymethylethoxy)propanol	34590-94-8	0.80	
Gold	7440-57-5	Lead Frame	0.024	0.007	240		Misc.	system	1.50	
Solid Epoxy Resin	Trade Secret	Die Attach	0.020	0.006	195	,	Aluminium-hydroxide-oxide	24623-77-6	0.50	
Phenol Resin	Trade Secret	Die Attach	0.020	0.006	195		Gold	7440-57-5	0.10	
Fused Silica	60676-86-0	Die Attach	0.052	0.015	520			Total		
Liquid epoxy resin	Trade Secret	Die Attach	0.020	0.006	195	0.04	(mg) Total	Die Attach	% of Total Weight	0.13
Synthetic Rubber	Trade Secret	Die Attach	0.020	0.006	195		Solid Epoxy Resin	Trade Secret	15.00	
Silicon	7440-21-3	Chip (Die)	5.980	1.716	59,800		Phenol Resin	Trade Secret	15.00	
Doped Gold	7440-57-5	Wire Bond	1.870	0.537	18,700		Fused Silica	60676-86-0	40.00	
Tin	7440-31-5	Plating on external leads (pins)	16.722	4.799	167,221		Liquid epoxy resin	Trade Secret	15.00	
Tin Silver	7440-31-5 7440-22-4	Plating on external leads (pins) Plating on external leads (pins)	16.722 0.700	4.799 0.201	167,221 7,004			Trade Secret Trade Secret	15.00 15	j
Tin	7440-31-5	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins)	16.722 0.700 0.088	4.799 0.201 0.025	167,221 7,004 876	470	Liquid epoxy resin Synthetic Rubber	Trade Secret Trade Secret Total	15.00 15 100.00	
Tin Silver	7440-31-5 7440-22-4 7440-50-8	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) TC	16.722 0.700	4.799 0.201	167,221 7,004	1.72	Liquid epoxy resin Synthetic Rubber (mg) Total	Trade Secret Trade Secret Total Chip (Die)	15.00 15 100.00 % of Total Weight	5.98
Tin Silver Copper	7440-31-5 7440-22-4 7440-50-8 0.0287 g To	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) Total Mass	16.722 0.700 0.088 TALS: 100.000	4.799 0.201 0.025 28.700	167,221 7,004 876 1,000,000		Liquid epoxy resin Synthetic Rubber	Trade Secret Trade Secret Total	15.00 15 100.00	
Tin Silver Copper Copper	7440-31-5 7440-22-4 7440-50-8 0.0287 g To	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) Total Mass	16.722 0.700 0.088 TALS: 100.000	4.799 0.201 0.025 28.700	167,221 7,004 876 1,000,000		Liquid epoxy resin Synthetic Rubber (mg) Total	Trade Secret Trade Secret Total Chip (Die)	15.00 15 100.00 % of Total Weight	5.98
Tin Silver Copper s semiconductor device and its homogenous materials comply 2/53/EC (End-of-Life Vehicles (ELV) Directive).	7440-31-5 7440-22-4 7440-50-8 0.0287 g To with EU Directive 2002/95	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) Total Mass //EC (RoHS Directive), EU Directive 2011/65/EU	16.722 0.700 0.088 TALS: 100.000	4.799 0.201 0.025 28.700	167,221 7,004 876 1,000,000		Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon	Trade Secret Trade Secret Total Chip (Die) 7440-21-3	15.00 15 100.00 % of Total Weight	5.98
Silver Copper Semiconductor device and its homogenous materials comply 2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical provated's knowledge and belief as of the date of this docume	7440-31-5 7440-22-4 7440-50-8 0.0287 g To with EU Directive 2002/95 ernal design controls, supplement, there is no credible reant, there is no credible reant,	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) To otal Mass //EC (RoHS Directive), EU Directive 2011/65/EU plier declarations, and /or analytical test data entional ingredient in the semiconductor devi	16.722 0.700 0.088 TALS: 100.000 J (RoHS Recast Dire	4.799 0.201 0.025 28.700 ctive) and with	167,221 7,004 876 1,000,000 h EU Directive		Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total	Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond	15.00 15 100.00 % of Total Weight 100 % of Total Weight	1.87
Tin Silver Copper s semiconductor device and its homogenous materials comply 2/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified via into the chemical substance is absent from the list above, the chemical substance is absent from the list above, the chemical supporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal	7440-31-5 7440-22-4 7440-50-8 0.0287 g To with EU Directive 2002/95 ernal design controls, supplements in NOT an intent, there is no credible realatory scheme world-wide.	Plating on external leads (pins) Tootal Mass /EC (RoHS Directive), EU Directive 2011/65/EU plier declarations, and /or analytical test data entional ingredient in the semiconductor devi	16,722 0.700 0.088 TALS: 100.000 J (RoHS Recast Dire ce and, to the best concentration of the	4.799 0.201 0.025 28.700 ctive) and with	167,221 7,004 876 1,000,000 h EU Directive		Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total	Trade Secret Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond 7440-57-5	15.00 15 100.00 % of Total Weight 100 % of Total Weight	5.98
Silver Copper semiconductor device and its homogenous materials comply //53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via interpreted in the semical substance is absent from the list above, the chemical reporated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any regulating compounds used by Microchip meet the UL94 V0 flammal: //ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar	7440-31-5 7440-22-4 7440-50-8 0.0287 g To with EU Directive 2002/95 ernal design controls, supplements in NOT an intent, there is no credible realatory scheme world-wide. bility standard for plastics	Plating on external leads (pins) Plating on external leads (pins) Plating on external leads (pins) To otal Mass /EC (RoHS Directive), EU Directive 2011/65/EU plier declarations, and /or analytical test data entional ingredient in the semiconductor devi soon to believe that the unavoidable impurity You can access the UL iQTM family of datal	16.722 0.700 0.088 TALS: 100.000 J (RoHS Recast Dire ce and, to the best of concentration of the bases to obtain a tes	4.799 0.201 0.025 28.700 ctive) and with	167,221 7,004 876 1,000,000 h EU Directive echnology ostance, if	0.54 5.03	Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total Doped Gold	Trade Secret Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond 7440-57-5 Total	15.00 15 100.00 % of Total Weight 100 % of Total Weight 100.00	5.98
Silver Copper Semiconductor device and its homogenous materials comply 2/53/EC (End-of-Life Vehicles (ELV) Directive). Impliance with the above EU Directives has been verified via interchemical substance is absent from the list above, the chemical orporated's knowledge and belief as of the date of this docume, is not below the threshold of regulatory concern for any regulding compounds used by Microchip meet the UL94 V0 flammal ozivul.com/global/eng/pages/offerings/industries/chemicals/plase protective "tubes" in which the specific product is shipped are tain "reels" may be made from PVC plastic. Prochip Technology Incorporated believes the information in the iroriginal packing materials is true and correct to the best of its impleteness and accuracy of data in this form because it has be promation is often protected from disclosure as trade secrets and vided only as estimates of the average weight of these parts are vided only as estimates of the average weight of these parts are	7440-31-5 7440-50-8 0.0287 g To with EU Directive 2002/95 ernal design controls, supplied to the second s	Plating on external leads (pins) Total Mass //EC (RoHS Directive), EU Directive 2011/65/EU plier declarations, and /or analytical test data entional ingredient in the semiconductor devi ason to believe that the unavoidable impurity You can access the UL iQTM family of datal oride (PVC) plastic. "Window envelopes" use unces restricted by RoHS in Microchip Techne is of the date listed in this form. Microchip Techne is of the date listed in Material Safety Data Shee to have been provided by subcontract assem	I 16,722 0.700 0.088 TALS: 100.000 J (RoHS Recast Dire ce and, to the best of concentration of the bases to obtain a test of	4.799 0.201 0.025 28.700 ctive) and with of Microchip Trechemical sub- th report at ag slip on the of a semiconducted cannot gual material suppliers. I	167.221 7,004 876 1,000,000 h EU Directive echnology ostance, if outer box and cor devices in trantee the iers. Supplier Information is	5.03	Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total	Trade Secret Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond 7440-57-5 Total Plating on external leads (pins)	15.00 15 100.00 % of Total Weight 100 % of Total Weight 100.00 100.00 % of Total Weight	1.87
Tin Silver	7440-31-5 7440-50-8 0.0287 g Ti with EU Directive 2002/95 ernal design controls, sup I substance is NOT an inte nt, there is no credible rea latory scheme world-wide. bility standard for plastics stics/ e made from polyvinyl chla is form concerning substa s knowledge and belief, as en compiled based on the d some information may n d the average weight of a on devices (silicon IC) in t y, express or implied, with	Plating on external leads (pins) otal Mass /EC (RoHS Directive), EU Directive 2011/65/Et plier declarations, and /or analytical test data entional ingredient in the semiconductor devi ison to believe that the unavoidable impurity . You can access the UL iQTM family of datal oride (PVC) plastic. "Window envelopes" use inces restricted by RoHS in Microchip Technic s of the date listed in this form. Microchip Technic to thave been provided by subcontract assem inticipated significant toxic metals componen the finished parts.	I 16.722 0.700 0.088 O 17ALS: 100.000 J (RoHS Recast Director of the bases to obtain a test obtain a test of the bases to obtain a test obtain a test of the bases to obtain a test obtain a test of the bases of the b	4.799 0.201 0.025 28.700 ctive) and with of Microchip To e chemical sub at report at g slip on the of est semiconduct est cannot gua material suppliers. I do not include usive, limited	167,221 7,004 876 1,000,000 h EU Directive echnology ostance, if outer box and or devices in orantee the iers. Supplier information is e trace levels	5.03	Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total Tin	Trade Secret Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-31-5	15.00 15 100.00 % of Total Weight 100.00 % of Total Weight 100.00 100.00 % of Total Weight	5.98
semiconductor device and its homogenous materials comply /53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified via interpretarily in the semical substance is absent from the list above, the chemical prorated's knowledge and belief as of the date of this docume is not below the threshold of regulatory concern for any reguling compounds used by Microchip meet the UL94 V0 flammal //ul.com/global/eng/pages/offerings/industries/chemicals/plas protective "tubes" in which the specific product is shipped ar in "reels" may be made from PVC plastic. ochip Technology Incorporated believes the information in the original packing materials is true and correct to the best of its pleteness and accuracy of data in this form because it has be mation is often protected from disclosure as trade secrets an ided only as estimates of the average weight of these parts ar opants, metals, and non-metal materials contained within silic ponting Technology Incorporated does not provide any warrant anties provided by Microchip Technology Incorporated and its	7440-31-5 7440-22-4 7440-50-8 0.0287 g Tr with EU Directive 2002/95 ernal design controls, supplements of the second se	Plating on external leads (pins) Total Mass //EC (RoHS Directive), EU Directive 2011/65/Et plier declarations, and /or analytical test data entional ingredient in the semiconductor devi ason to believe that the unavoidable impurity . You can access the UL iQTM family of datal oride (PVC) plastic. "Window envelopes" use unces restricted by RoHS in Microchip Technes of the date listed in this form. Microchip Technes of the date listed in this form. Microchip Technes of the date listed in this form. Microchip Technes of the date listed in this form. Microchip Technes of the date listed in this form. Microchip Technes of the date listed in this form. Microchip that Shee ot have been provided by subcontract assemnticipated significant toxic metals componen the finished parts.	I 16,722 0.700 0.088 TALS: 100.000 J (RoHS Recast Directory of the best of concentration of the bases to obtain a test obtain a te	4.799 0.201 0.025 28.700 ctive) and with of Microchip Tree chemical sub- treport at treport at treport at semiconducted cannot gua- material suppliers. I do not include usive, limited re provided in	167.221 7,004 876 1,000,000 h EU Directive echnology ostance, if outer box and or devices in trantee the iers. Supplier Information is e trace levels product Microchip's	5.03	Liquid epoxy resin Synthetic Rubber (mg) Total Doped Silicon (mg) Total Doped Gold (mg) Total Tin Silver	Trade Secret Trade Secret Trade Secret Total Chip (Die) 7440-21-3 Wire Bond 7440-57-5 Total Plating on external leads (pins) 7440-31-5	15.00 15 100.00 % of Total Weight 100 % of Total Weight 100.00 100.00 % of Total Weight 4.00 4.00	1.87

28.70 100.00

MAQE 48 WFBGA 11:20 AM: 8/29/2013

Compliant to IEC 61249-2-21:2003

Basic Substance	MICROCHIP Semiconductor Device Type:	BG 121 // o	odi TERGA 10Y10Y1 (2Y)		ation Base :	-		Package Homogeneou 8.1 Electronics (e.g. pc bo			JEDEC 97 Product Marking and/or Pkg. Labeling e1
Basic Observation	Connectination Device Type.	I IZI (Le.		% Total					Mald Commound /	0/ a4 Ta4al	
Build 1852 1973 1974 1975	Basic Substance	CAS Number			mg/part	nnm	107.44	(mg) Total			
Description 2006-2546 Most Company of Telegory File 3-308 Telegory 1-308 Most Company of Telegory 1-308			•					fused silica			1
Migris Latentinos								solid epoxy resin			
Carbon Lista	phenol resin	108-95-2	Mold Compound / Halogen-Free	3.630	6.983	36,296		phenol resin	108-95-2	6.50	
Copyright Copy											j
Class Form Committed programs Company								Carbon black			j
Comparison Com	Copper	7440-50-8	Substrate + Solder Mask (AUS308)Halogen-Free	7.762	14.933	77,616				100.00	
Site_Abminist propaged 7611-860 Substants + Solvet Mask (AUSSSSPE) (abusine 1.00 to 1.00 1.00	Glass fibers	65997-17-3	Substrate + Solder Mask (AUS308)Halogen-Free	4.627	8.902	46,267	41.60	(mg) Total	Mask (AUS308)		
National 7440-222 Substitute 500eth Males (AUSSDEPHates) Feet 1.00	Phenol, formaldehyde, (chloromethyl)oxirane polymer			4.627				Copper			1
Substant Principal Princ	Silica, chemically prepared	7631-86-9	Substrate + Solder Mask (AUS308)Halogen-Free	1.730	3.328	17,296			65997-17-3	21.40	1
Blast											l
Magnesian stocks			Substrate + Solder Mask (AUS308)Halogen-Free								ł
Administry (Y.200 2,998-386 Substantia - Solder Mass (AMS-309) Hallocyn Frie 0.173 0.353 1.726											1
Caber Cabe											1
Marcian Marc											l
Automate Hydroxide coate			Substrate + Solder Mask (AUS308)Halogen-Free								1
Stever (Ag)	Aluminium-hydroxide-oxide	24623-77-6	Substrate + Solder Mask (AUS308)Halogen-Free	0.108	0.208	1,081		(2-Methoxymethylethoxy)propanol	34590-94-8	0.80	
Disease Research Trade Secret Diseas Altach Disease Dise									system		j
Action Resin Trade Secret De Altach 0.052 0.999 516 Total 190.00 Physimatic Resin Trade Secret De Altach De Altach 0.051 0.040 200 1.46 (mg) Total 190.00 Physimatic Resin Trade Secret 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 7.4 Total 1.46 Physimatic Resin Trade Secret 7.4 Total 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 7.4 Total 1.46 Total 1.46 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 7.4 Total 1.46 Total 1.46 Physimatic Resin Trade Secret 7.4 Total 1.46 Total 1.46											ı
Polymeric Regin Trade Secret Die Attach 0.021 0.040 206 1.46 (mg) Total Die Attach Waldin For reporting purposes, ellicon integrated cross presented to be all ellicon 1.7460-21-3 Chips (Die 1.7460-21-3 Chip								Gold			1
For reporting purposes, life in the specific product of the specific product of the specific product is shipped are made from polymy with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If the semiconductor device and its homogenous materials comply with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If the semiconductor device and its homogenous materials comply with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If the semiconductor device and its homogenous materials comply with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If the semiconductor device and its homogenous materials comply with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If the semiconductor device and its homogenous materials comply with EU Directive 2002/SEC (Endo-Life Vehicles (EU) Directive). If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated when the threshold of real substance is about from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and its the semiconductor device and its three protective thuses" in which the specific product is shipped are made from polyvinyi chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the source box and certain "reels" may be made from PVC plastic. If the complete semiconductor device and the new real substance is NOT an intentional ingredient in the semiconductor device and the packing slip on the source box and certain "reels" may be made from PVC plastic. If the complete semiconductor device and the new real position of the semiconductor device and the new real position of an average weight of these period in Material Safety Data Sheets provided in Microchip Technology Incorporated as accuracy of data in this form concerning substances restricted by RoHS in Microchip Technology Incorporated as semiconductor or chemical	Acriate Resin	Trade Secret	Die Attach	0.052	0.099	516			Total		
For reporting purposes, allion integrated circuit presumed to be all silicion (740)-214 Chip (10e) 7,940 (17,940) (17,94	Polymeric Resin	Trade Secret	Die Attach	0.021	0.040	206	1.46	(mg) Total	Die Attach		
Total (Sher (Ag) 7,440-231-5 Solder Ball (SAC405) 12 224 23 519 122-240 A column Feature (Column Fea								Silver (Aa)			1
Silver (Ag) 1744-0224 Solder Ball (SAC4059) 0.512 0.985 5.120 1.028 to 1.02											1
Copier (Cu) 1744-05-08 Solder Ball (SAC405) 0.064 0.1-23 840 Polymeric Regin Trace Secret 3 3 October Ball (SAC405) 18-06 Write 1.030 1.931 10256.00 Polymeric Regin Trace Secret 3 3 October Ball (SAC405) 18-06 Polymeric Regin Trace Secret 3 3 October Ball (SAC405) 18-06 Polymeric Regin Trace Secret 3 3 October Ball (SAC405) 18-06 Polymeric Regin Trace Secret 3 October 19-06 Poly		7440-22-4		0.512				Acrlate Resin			
Palladium (Pd) 7440-05-3 Bond Wire 0.010 0.020 104.00 15.28 Total (mg) Chip (Die) Wighlight (Pd) (Pd) Wighlight (Pd) (Pd) (Pd) (Pd) (Pd) (Pd) (Pd) (Pd)					0.123			Polymeric Resin		3	j
Palladium (Pd) 7440-05-3 Bond Wire 0.010 0.020 104.00 192.40 1.000,000 192.400 192.400 1.000,000 192.400 1.000,000 192.4	Gold (Au)	7440-57-5	Bond Wire	1.030	1.981	10,296.00			Total	100.00	
This semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Directive shas been verified via internal design controls, supplier declarations, and /or analytical test data. If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not believe that the unavoidable impurity concentration of the chemical substance, if any, is not believe that the unavoidable impurity concentration of the chemical substance, if any, is not believe that the unavoidable impurity concentration of the chemical substance, if any, is not believe that the unavoidable impurity concentration of the chemical substance is a specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certation "redist" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certation "redist" in which the specific product is shipped are made from PVC plastic. Total 100.00 Total 10	Palladium (Pd)	7440-05-3	Bond Wire	0.010	0.020	104.00	15.28	Total (mg)	Chip (Die)		
This semiconductor device and its homogenous materials comply with EU Directive 2002/93/EC (ROHS Directive), EU Directive 2011/65/EU (ROHS Recast Directive) and with EU Directive 2002/93/EC (ROH-Of-Life Vehicles (ELV) Directive). 24.63 (mg) Total Solder Ball (SAC405) % of Total Weight (Compliance with the above EU Directives). 35.60 (mg) Total Solder Ball (SAC405) % of Total Weight (Compliance with the above EU Directives) as seen from the list above, the chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology incorporated sk knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. 36.80 (mg) Total Solder Ball (SAC405) % of Total Weight (PVG) plastic. The concerning substance is absent from the list above, the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. 36.80 (mg) Total Solder Ball (SAC405) % of Total Velocity (PVG) as the complex of the compl			TOTALS:	100.000	192.400	1,000,000					<u>]</u>
EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and for analytical test data. In (Sn) 7440-31-5 95.50 Tin (Sn) 7440-31-5 95.50 Tin (Sn) 7440-31-5 95.50 Silver (Ag) Silver (Ag	This semiconductor device and its homogenous materials comply w			U (RoHS Rec	ast Directive	and with			Total		1
If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/englpages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated devices in their original packing materials is true and correct to the best of the sweeting and some information in any not have been provided by subcontract devices in their original packing material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Supplier information is provided only as estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip Squotatio	EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).		, , ,	`		-	24.63	(mg) Total	Solder Ball (SAC405)		
Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide. Molding compounds used by Microchip meet the UL94 V9 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated deby a sestimate so that this form because it has been compiled based on the ranges provided by subcontract devices in their original packing material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Supplier information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materiac contained within silicon devices (silicon CI) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Total 100.00 Take 100.00	Compliance with the above EU Directives has been verified via inter	nal design contro	ols, supplier declarations, and for analytical test data	1.				Tin (Sn)	7440-31-5	95.50	
Molding compounds used by Microchip meet the UL 94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form Material Satest Poats Resets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal or devices (slicion IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Gold (Au) 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000 7440-57-5 99,0000	Technology Incorporated's knowledge and belief as of the date of the	nis document, the	re is no credible reason to believe that the unavoida					Silver (Ag)			
The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic. Microchip Technology Incorporated believes the information in this form concerning substances restricted by ROHS in Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by Subcontract assemblers and raw material suppliers. Supplier information is provided only as estimates of not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's subsidiaries are contained in Microchip's quotations, sales order acknowledgement, and invoices.	•	-							7440-22-4	4.00	4
Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by subcontract assemblers and raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products. Total 100.00			lastics. You can access the UL iQTM family of datak	pases to obtai	n a test repo	rt at		Copper (Cu)	7440-50-8	0.50]
Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw materials suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. 2.00 (mg) Total Bond Wire % of Total Weight 1.04 Weigh		made from polyv	inyl chloride (PVC) plastic. "Window envelopes" use	ed to hold the	packing slip	on the			Total	100.00	
cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. 1.04 2.00 (mg) Total Weight 1.04	Microchip Technology Incorporated believes the information in this										
Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices. Gold (Au) 7440-57-5 99.0000	cannot guarantee the completeness and accuracy of data in this for by raw material suppliers. Supplier information is often protected fre assemblers and raw material suppliers. Information is provided only metals components. These estimates do not include trace levels of	ot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided w material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract mobilers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic ls components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished					(mg) Total	Bond Wire			
Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.	flicrochip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are							Gold (Au)	7440-57-5	99,0000	[
Total 100.00	licrochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential r otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test										
	eports (303) or or this certificate or compliance for semiconductor	products.									1
						l			Total	100.00	100.0

BG 121 TFBGA 11:20 AM : 8/29/2013



Semiconductor Device Type: 04 (SAC 105) / WCSP AF/AL					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.078	1.551	15,514	
Aluminum	7429-90-5	0.016	0.325	3,249	
Titanium	7440-32-6	0.001	0.014	135	
Arsenic	7440-38-2	1.87E-09	3.74E-08	3.74E-04	
Boron	7440-42-8	2.70E-10	5.40E-09	5.40E-05	
Phosphorous	7723-14-0	3.09E-11	6.19E-10	6.19E-06	
Copper	7440-50-8	1.28E-03	0.026	256	
Polymer	Trade Secret	0.007	0.138	1,377	
Silicon	7440-21-3	4.647	92.947	929,470	
Tin	7440-31-5	0.246	4.925	49,250	
Silver	7440-22-4	0.003	0.050	500	
Copper	7440-50-8	0.001	0.025	250	
· ·	Totals	5.00	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device Type: 05 (SAC 105) / WCSP AG					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.087	1.542	15,423	
Aluminum	7429-90-5	0.018	0.323	3,230	
Titanium	7440-32-6	0.001	0.013	134	
Arsenic	7440-38-2	2.09E-09	3.72E-08	3.72E-04	
Boron	7440-42-8	3.02E-10	5.37E-09	5.37E-05	
Phosphorous	7723-14-0	3.46E-11	6.15E-10	6.15E-06	
Copper	7440-50-8	1.43E-03	0.025	254	
Polymer	Trade Secret	0.008	0.137	1,369	
Silicon	7440-21-3	5.198	92.403	924,034	
Tin	7440-31-5	0.308	5.472	54,722	
Silver	7440-22-4	0.003	0.056	556	
Copper	7440-50-8	0.002	0.028	278	
	Totals:	5.6250	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device Type: 08 (SAC 105) / WCSP AC					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.380	1.542	15,423	
Aluminum	7429-90-5	0.080	0.323	3,230	
Titanium	7440-32-6	0.003	0.013	134	
Arsenic	7440-38-2	9.17E-09	3.72E-08	3.72E-04	
Boron	7440-42-8	1.32E-09	5.37E-09	5.37E-05	
Phosphorous	7723-14-0	1.52E-10	6.15E-10	6.15E-06	
Copper	7440-50-8	6.27E-03	0.025	254	
Polymer	Trade Secret	0.034	0.137	1,369	
Silicon	7440-21-3	22.793	92.403	924,034	
Tin	7440-31-5	1.350	5.472	54,722	
Silver	7440-22-4	0.014	0.056	556	
Copper	7440-50-8	0.007	0.028	278	
	Totals:	24.67	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device Type: 08 (SAC 305) / WCSP FA					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.243	1.542	15,423	
Aluminum	7429-90-5	0.051	0.323	3,230	
Titanium	7440-32-6	0.002	0.013	134	
Arsenic	7440-38-2	5.86E-09	3.72E-08	3.72E-04	
Boron	7440-42-8	8.46E-10	5.37E-09	5.37E-05	
Phosphorous	7723-14-0	9.70E-11	6.15E-10	6.15E-06	
Copper	7440-50-8	4.01E-03	0.025	254	
Polymer	Trade Secret	0.022	0.137	1,369	
Silicon	7440-21-3	14.570	92.403	924,034	
Tin	7440-31-5	0.845	5.361	53,611	
Silver	7440-22-4	0.026	0.167	1,667	
Copper	7440-50-8	0.004	0.028	278	
	Totals:	15.77	100	100000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device Type: 14 (SAC 105) / WCSP AP					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.214	1.531	15,309	
Aluminum	7429-90-5	0.045	0.321	3,206	
Titanium	7440-32-6	0.002	0.013	133	
Arsenic	7440-38-2	5.17E-09	3.69E-08	3.69E-04	
Boron	7440-42-8	7.46E-10	5.33E-09	5.33E-05	
Phosphorous	7723-14-0	8.55E-11	6.11E-10	6.11E-06	
Copper	7440-50-8	3.53E-03	0.025	252	
Polymer	Trade Secret	0.019	0.136	1,359	
Silicon	7440-21-3	12.841	91.724	917,240	
Tin	7440-31-5	0.862	6.156	61,563	
Silver	7440-22-4	0.009	0.063	625	
Copper	7440-50-8	0.004	0.031	313	
	Totals:	14 0000	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

14_105 CS 9:54 AM : 8/29/2013



Semiconductor Device Type: 16 (SAC 305) / WCSP FB					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.429	1.531	15,309	
Aluminum	7429-90-5	0.090	0.321	3,206	
Titanium	7440-32-6	0.004	0.013	133	
Arsenic	7440-38-2	1.03E-08	3.69E-08	3.69E-04	
Boron	7440-42-8	1.49E-09	5.33E-09	5.33E-05	
Phosphorous	7723-14-0	1.71E-10	6.11E-10	6.11E-06	
Copper	7440-50-8	7.07E-03	0.025	252	
Polymer	Trade Secret	0.038	0.136	1,359	
Silicon	7440-21-3	25.712	91.724	917,240	
Tin	7440-31-5	1.691	6.031	60,313	
Silver	7440-22-4	0.053	0.188	1,875	
Copper	7440-50-8	0.009	0.031	313	
	Totals	28 03	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

16_305 CS 9:54 AM : 8/29/2013



Semiconductor Device Type: 18 (SAC 105) / WCSP AM					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.418	1.516	15,164	
Aluminum	7429-90-5	0.088	0.318	3,176	
Titanium	7440-32-6	0.004	0.013	132	
Arsenic	7440-38-2	1.01E-08	3.66E-08	3.66E-04	
Boron	7440-42-8	1.46E-09	5.28E-09	5.28E-05	
Phosphorous	7723-14-0	1.67E-10	6.05E-10	6.05E-06	
Copper	7440-50-8	6.90E-03	0.025	250	
Polymer	Trade Secret	0.037	0.135	1,346	
Silicon	7440-21-3	25.069	90.850	908,504	
Tin	7440-31-5	1.902	6.893	68,929	
Silver	7440-22-4	0.059	0.214	2,143	
Copper	7440-50-8	0.010	0.036	357	
	Totals:	27.59	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

18_105 CS 9:54 AM : 8/29/2013



Semiconductor Device Type: 20 (SAC 105) / WCSP AE					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.465	1.516	15,164	
Aluminum	7429-90-5	0.097	0.318	3,176	
Titanium	7440-32-6	0.004	0.013	132	
Arsenic	7440-38-2	1.12E-08	3.66E-08	3.66E-04	
Boron	7440-42-8	1.62E-09	5.28E-09	5.28E-05	
Phosphorous	7723-14-0	1.85E-10	6.05E-10	6.05E-06	
Copper	7440-50-8	7.66E-03	0.025	250	
Polymer	Trade Secret	0.041	0.135	1,346	
Silicon	7440-21-3	27.855	90.850	908,504	
Tin	7440-31-5	2.157	7.036	70,357	
Silver	7440-22-4	0.022	0.071	714	
Copper	7440-50-8	0.011	0.036	357	
	Totals	30 6600	100	100000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

9:54 AM: 8/29/2013



Semiconductor Device Type: 28 (SAC 105) / WCSP AH					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.314	1.497	14,969	
Aluminum	7429-90-5	0.066	0.314	3,135	
Titanium	7440-32-6	0.003	0.013	130	
Arsenic	7440-38-2	7.58E-09	3.61E-08	3.61E-04	
Boron	7440-42-8	1.09E-09	5.21E-09	5.21E-05	
Phosphorous	7723-14-0	1.25E-10	5.97E-10	5.97E-06	
Copper	7440-50-8	5.18E-03	0.025	247	
Polymer	Trade Secret	0.028	0.133	1,329	
Silicon	7440-21-3	18.834	89.686	896,857	
Tin	7440-31-5	1.724	8.208	82,083	
Silver	7440-22-4	0.018	0.083	833	
Copper	7440-50-8	0.009	0.042	417	
•	Totals:	21 00	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

28_105 CS 9:54 AM : 8/29/2013



Semiconductor Device Type: 32 (SAC 105) / WCS AD					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	0.629	1.497	14,969	
Aluminum	7429-90-5	0.132	0.314	3,135	
Titanium	7440-32-6	0.005	0.013	130	
Arsenic	7440-38-2	1.52E-08	3.61E-08	3.61E-04	
Boron	7440-42-8	2.19E-09	5.21E-09	5.21E-05	
Phosphorous	7723-14-0	2.51E-10	5.97E-10	5.97E-06	
Copper	7440-50-8	1.04E-02	0.025	247	
Polymer	Trade Secret	0.056	0.133	1,329	
Silicon	7440-21-3	37.711	89.686	896,857	
Tin	7440-31-5	3.451	8.208	82,083	
Silver	7440-22-4	0.035	0.083	833	
Copper	7440-50-8	0.018	0.042	417	
	Totals:	42 048	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device Type: 44 (SAC 105) / WCSP AQ					
Basic Substance	CAS Number	mg/part	% Total Weight	ppm	
Tungsten	7440-33-7	1.071	1.470	14,697	
Aluminum	7429-90-5	0.224	0.308	3,078	
Titanium	7440-32-6	0.009	0.013	128	
Arsenic	7440-38-2	2.58E-08	3.54E-08	3.54E-04	
Boron	7440-42-8	3.73E-09	5.11E-09	5.11E-05	
Phosphorous	7723-14-0	4.27E-10	5.86E-10	5.86E-06	
Copper	7440-50-8	1.76E-02	0.024	242	
Polymer	Trade Secret	0.095	0.130	1,305	
Silicon	7440-21-3	64.160	88.055	880,550	
Tin	7440-31-5	7.177	9.850	98,500	
Silver	7440-22-4	0.073	0.100	1,000	
Copper	7440-50-8	0.036	0.050	500	
•	Totals:	72 86	100	1000000	

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Device	ce Type: 48 (SAC 305) /	WCSP F	·c	
Basic Substance	CAS Number	mg/part	% Total Weight	ppm
Tungsten	7440-33-7	0.279	1.470	14,697
Aluminum	7429-90-5	0.058	0.308	3,078
Titanium	7440-32-6	0.002	0.013	128
Arsenic	7440-38-2	6.72E-09	3.54E-08	3.54E-04
Boron	7440-42-8	9.70E-10	5.11E-09	5.11E-05
Phosphorous	7723-14-0	1.11E-10	5.86E-10	5.86E-06
Copper	7440-50-8	4.59E-03	0.024	242
Polymer	Trade Secret	0.025	0.130	1,305
Silicon	7440-21-3	16.695	88.055	880,550
Tin	7440-31-5	1.830	9.650	96,500
Silver	7440-22-4	0.057	0.300	3,000
Copper	7440-50-8	0.009	0.050	500
	Totals	18 960	100	1000000

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

48_305 CS 9:54 AM : 8/29/2013



Semiconductor Dev	ice Type: 48 (SAC 266) /	WCSP A	ΛK	
Basic Substance	CAS Number	mg/part	% Total Weight	ppm
Tungsten	7440-33-7	1.168	1.470	14,697
Aluminum	7429-90-5	0.245	0.308	3,078
Titanium	7440-32-6	0.010	0.013	128
Arsenic	7440-38-2	2.82E-08	3.54E-08	3.54E-04
Boron	7440-42-8	4.07E-09	5.11E-09	5.11E-05
Phosphorous	7723-14-0	4.66E-10	5.86E-10	5.86E-06
Copper	7440-50-8	1.93E-02	0.024	242
Polymer	Trade Secret	0.104	0.130	1,305
Silicon	7440-21-3	69.993	88.055	880,550
Tin	7440-31-5	7.694	9.680	96,800
Silver	7440-22-4	0.207	0.260	2,600
Copper	7440-50-8	0.048	0.060	600
	Totals:	79.4880	100	1000000

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Dev	ice Type: 64 (SAC 305) /	WCSP [Υ	
Basic Substance	CAS Number	mg/part	% Total Weight	ppm
Tungsten	7440-33-7	1.212	1.429	14,289
Aluminum	7429-90-5	0.254	0.299	2,993
Titanium	7440-32-6	0.011	0.012	124
Arsenic	7440-38-2	2.92E-08	3.44E-08	3.44E-04
Boron	7440-42-8	4.22E-09	4.97E-09	4.97E-05
Phosphorous	7723-14-0	4.83E-10	5.70E-10	5.70E-06
Copper	7440-50-8	2.00E-02	0.024	235
Polymer	Trade Secret	0.108	0.127	1,268
Silicon	7440-21-3	72.586	85.609	856,090
Tin	7440-31-5	10.227	12.063	120,625
Silver	7440-22-4	0.318	0.375	3,750
Copper	7440-50-8	0.053	0.063	625
	Totals:	84.79	100	1000000

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.



Semiconductor Dev	ice Type: 80 (SAC 305) /	WCSP F	s	
Basic Substance	CAS Number	mg/part	% Total Weight	ppm
Tungsten	7440-33-7	1.082	1.361	13,608
Aluminum	7429-90-5	0.227	0.285	2,850
Titanium	7440-32-6	0.009	0.012	119
Arsenic	7440-38-2	2.61E-08	3.28E-08	3.28E-04
Boron	7440-42-8	3.76E-09	4.74E-09	4.74E-05
Phosphorous	7723-14-0	4.31E-10	5.43E-10	5.43E-06
Copper	7440-50-8	1.78E-02	0.022	224
Polymer	Trade Secret	0.096	0.121	1,208
Silicon	7440-21-3	64.808	81.532	815,324
Tin	7440-31-5	12.784	16.083	160,833
Silver	7440-22-4	0.397	0.500	5,000
Copper	7440-50-8	0.066	0.083	833
	Totals:	79,4880	100	1000000

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

80_305 CS 9:54 AM : 8/29/2013

Semiconductor Device	e Type: MS and UA	8 (Lead) MSOP 3x3mm (A3)		nation Base /			•	geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
Basic Substance	CAS Number	"Contained In" Sub-Component	% Total Weight	mg/part	ppm	20.43	(mg) Total	Mold Compound	% ot Total Weight	T 79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	17.755	693.542		Silica, vitreous	60676-86-0	86.91	1
Epoxy Resin	Trade Secret	Mold Compound Mold Compound	6,121	1,567	61.207		Epoxy Resin	Trade Secret	7.67	
Phenolic Resin	Trade Secret	Mold Compound	4.078	1.044	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.063	2,474		Carbon Black	1333-86-4	0.31	1
Copper	7440-50-8	Lead Frame	10.031	2,568	100,314			Total	100.00	4
Iron	7439-89-6	Lead Frame	0.247	0.063	2,468	2.69	(mg) Total	Lead Frame	% of Total Weight	t 10.5
Silver	7440-22-4	Lead Frame	0.200	0.051	2.000		Copper	7440-50-8	95.54	1
Zinc	7440-66-6	Lead Frame	0.013	0.003	131		Iron	7439-89-6	2.35	1
Phosphorous	7723-14-0	Lead Frame	0.009	0.002	87		Silver	7440-22-4	1.91	1
Silver (Ag)	7440-22-4	Die Attach	0.563	0.144	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.027	1,050		Phosphorous	7723-14-0	0.08	1
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.014	563			Total	100.00	4
Modified Amine	827-43-0	Die Attach	0.026	0.007	263	0.19	(mg) Total	Die Attach	% of Total Weight	t 0.75
Silicon	7440-21-3	Chip (Die)	7.500	1.920	75,000		Silver (Ag)	7440-22-4	75	1
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.050	1.965		Modified Epoxy Resin	13561-08-5	14	i
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.004	0.001	35	D	iglycidylether of bisphenol-F	54208-63-8	8	i
Tin		Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.320	12,500		Modified Amine	827-43-0	4	i
• • • • • • • • • • • • • • • • • • • •		TOTALS:	100.000	25.600	1.000.000		Modified 7 timine	Total	100.00	4
	0.0050			20.000	.,000,000					
	comply with EU Directive 2	g Total Mass 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and wit	h EU	1.92	Total (mg) Doped Silicon	7440-21-3	% of Total Weight	7.5
semiconductor device and its homogenous materials ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified	comply with EU Directive 2	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ective) and wit	h EU	1.92	T		100	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Diance with the above EU Directives has been verified nemical substance is absent from the list above, the c porated's knowledge and belief as of the date of this c	comply with EU Directive 2 via internal design contro hemical substance is NOT locument, there is no cred	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer	to the best o	of Microchip To	echnology	0.05	T	7440-21-3	100	
tive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). bliance with the above EU Directives has been verified nemical substance is absent from the list above, the c porated's knowledge and belief as of the date of this c s not below the threshold of regulatory concern for ar ing compounds used by Microchip meet the UL94 V0 f	comply with EU Directive 2 via internal design contro hemical substance is NOT locument, there is no cred ny regulatory scheme work llammability standard for p	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer	to the best o	of Microchip To chemical sub	echnology		Doped Silicon	7440-21-3 Total Wire Bond - Copper, palladium	100	
ctive 2002/53/EC (End-of-Life Vehicle's (ELV) Directive). pliance with the above EU Directives has been verified hemical substance is absent from the list above, the corporated's knowledge and belief as of the date of this cis not below the threshold of regulatory concern for an ing compounds used by Microchip meet the UL94 V0 f/ful.com/global/eng/pages/offerings/industries/chemicsprotective "tubes" in which the specific product is ship	comply with EU Directive 2 via internal design contro hemical substance is NOT locument, there is no cred ny regulatory scheme worl lammability standard for p als/plastics/	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH ils, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and lible reason to believe that the unavoidable impurity concer d-wide.	to the best on tration of the	of Microchip To e chemical sub t report at	echnology ostance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd)	100 100.00 % of Total Weight	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the comporated's knowledge and belief as of the date of this compounds used by Microchip meet the UL94 V0 for classified the substance of the subs	comply with EU Directive 2 via internal design control homical substance is NOT homical substance is NOT homical substance is NOT homical substance worl lammability standard for pals/plastics/ opped are made from polyvi on in this form concerning test of its knowledge and by has been compiled based rets and some information oursts and the average weig	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Ils, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer d-wide. Ilastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir elilef, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro inay not have been provided by subcontract assemblers a tht of anticipated significant toxic metals components. The	to the best on tration of the obtain a test old the packing accorporated's ly Incorporate vided by raw rund raw mater	of Microchip To e chemical sub et report at g slip on the of semiconduct d cannot gua material suppliers.	echnology ostance, if outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	100 100.00 % of Total Weight 98	
ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the comporated's knowledge and belief as of the date of this or is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 for ////////////////////////////////////	comply with EU Directive 2 I via internal design contro hemical substance is NOT locument, there is no cred by regulatory scheme worl lammability standard for pals/plastics/ opped are made from polyvi on in this form concerning test of its knowledge and be has been compiled based trets and some information parts and the average weig tin silicon devices (silicon varranty, express or implie	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Ils, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer d-wide. Ilastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology Ir elilef, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro inay not have been provided by subcontract assemblers a tht of anticipated significant toxic metals components. The	to the best of the contraction of the contraction. The exclusion.	of Microchip To e chemical sub- treport at g slip on the of semiconduct ed cannot gua material suppliers. do not include usive, limited	echnology stance, if buter box and or devices in rantee the liers. Supplier Information is trace levels		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	100 100.00 % of Total Weight 98	0.2
pliance with the above EU Directives (ELV) Directive). pliance with the above EU Directives has been verified themical substance is absent from the list above, the crporated's knowledge and belief as of the date of this cis not below the threshold of regulatory concern for aring compounds used by Microchip meet the UL94 V0 I/ful.com/global/eng/pages/offerings/industries/chemiciprotective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic. sochip Technology Incorporated believes the informatic original packing materials is true and correct to the boleteness and accuracy of data in this form because it mation is often protected from disclosure as trade secided only as estimates of the average weight of these popants, metals, and non-metal materials contained with occhip Technology Incorporated does not provide any wanties provided by Microchip Technology Incorporated ations, sales order acknowledgement, and invoices.	comply with EU Directive 2 I via internal design contro hemical substance is NOT locument, there is no cred to regulatory scheme worl lammability standard for pals/plastics/ opped are made from polyvi on in this form concerning test of its knowledge and be has been compiled based tests and some information parts and the average weig tin silicon devices (silicon varranty, express or implied and its subsidiaries are ce changes to Material Conte he users' reliance on the in	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Ils, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and ible reason to believe that the unavoidable impurity concer d-wide. Diastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to he substances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets pro unay not have been provided by subcontract assemblers a the of anticipated significant toxic metals components. The IC) in the finished parts. Icd, with respect to the information provided in this declarate.	to the best of the bottom of the bottom of the bottom obtain a test of the packing accorporated's gylncorporated in the bottom of the bottom o	of Microchip To e chemical sub- et report at g slip on the of semiconduct ed cannot gua material suppliers. do not include usive, limited in re provided in	echnology ostance, if outer box and or devices in rantee the iers. Supplier Information is trace levels product Microchip's	0.05	Doped Silicon (mg) Total Copper Palladium	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	100 100.00 % of Total Weight 98 2	0.2
citive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). pliance with the above EU Directives has been verified hemical substance is absent from the list above, the croorated's knowledge and belief as of the date of this c is not below the threshold of regulatory concern for aring compounds used by Microchip meet the UL94 V0 f/l/ul.com/global/eng/pages/offerings/industries/chemicorotective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic. Dechip Technology Incorporated believes the informatic original packing materials is true and correct to the be oleteness and accuracy of data in this form because it mation is often protected from disclosure as trade sec ided only as estimates of the average weight of these inpants, metals, and non-metal materials contained with occhip Technology Incorporated does not provide any vanties provided by Microchip Technology Incorporated ations, sales order acknowledgement, and invoices.	comply with EU Directive 2 I via internal design contro hemical substance is NOT locument, there is no cred to regulatory scheme worl lammability standard for pals/plastics/ opped are made from polyvi on in this form concerning test of its knowledge and be has been compiled based tests and some information parts and the average weig tin silicon devices (silicon varranty, express or implied and its subsidiaries are ce changes to Material Conte he users' reliance on the in	is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and lible reason to believe that the unavoidable impurity concerd-wide. Islastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastics. You can access the UL iQTM family of databases to lastic substances restricted by RoHS in Microchip Technology Ir elief, as of the date listed in this form. Microchip Technolog on the ranges provided in haterial Safety Data Sheets provided by subcontract assemblers a plat of anticipated significant toxic metals components. The IC) in the finished parts. It is distincted in this declaration in the list of the finished parts. It is distincted in this declaration in the list of the provided in this declaration in the microchip's standard terms and conditions of the provided in this declaration is not provided in this declaration in the list of the provided in this declaration is and shall not be liable for any damages, dient in the provided in the pro	to the best of the bottom of the bottom of the bottom obtain a test of the packing accorporated's gylncorporated in the bottom of the bottom o	of Microchip To e chemical sub- et report at g slip on the of semiconduct ed cannot gua material suppliers. do not include usive, limited in re provided in	echnology ostance, if outer box and or devices in rantee the iers. Supplier Information is trace levels product Microchip's	0.05	Doped Silicon (mg) Total Copper Palladium (mg) Total	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 98 2 100.00 % of Total Weight	0.2

MS UA 08 MSOP 10:02 AM : 8/29/2013

MICROCHIP	Semiconductor Device	Type: Pand PA 8 (Le	ad) PDIP (Small Outline300") (C4 / CK)		ation Base A	. ,		•	geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	Comiconautor Bevice	Typo: Tanal 77 O(Est	"Contained In"	% Total			388.39	(mg) Total	Mold Compound	% ot Total Weigh	
E	sasic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	366.39				1 79.0
	Fused Silica	60676-86-0	Mold Compound	57.456	279.638	574,560		Fused Silica	60676-86-0	72.00	
N	letal Hydro Oxide	Trade Secret	Mold Compound	8.778	42.723	87,780		Metal Hydro Oxide	Trade Secret	11.00	
	Epoxy Resin Phenol Resin	Trade Secret Trade Secret	Mold Compound Mold Compound	5.586 5.586	27.187 27.187	55,860 55,860		Epoxy Resin Phenol Resin	Trade Secret Trade Secret	7.00 7.00	
	SiO2	14808-60-7	Mold Compound Mold Compound	1.995	9,710	19,950		SiO2	14808-60-7	2.50	1
	Carbon Black	1333-86-4	Mold Compound	0.399	1.942	3,990		Carbon Black	1333-86-4	0.50	
	Copper	7440-50-8	Lead Frame	10.031	48.823	100,314		Carbon Black	Total		4
	Iron	7439-89-6	Lead Frame	0.247	1.201	2,468	51.10	(mg) Total	Lead Frame	% of Total Weigh	t 10.5
	Silver	7440-22-4	Lead Frame	0.200	0.974	2,000		Copper	7440-50-8	95.54	
	Zinc	7440-66-6	Lead Frame	0.013	0.064	131		Iron	7439-89-6	2.35	
	Phosphorous	7723-14-0	Lead Frame	0.009	0.042	87		Silver	7440-22-4	1.91	1
	Silver	7440-22-4	Die Attach	0.550	2.678	5,502		Zinc	7440-66-6	0.13	
	Epoxy Resin	9003-36-5	Die Attach	0.110	0.535	1,100		Phosphorous	7723-14-0	0.08	
	Diluent	3101-60-8	Die Attach	0.055	0.268	550			Total	100.00	
	Phenolic hardener	Trade secret	Die Attach	0.022	0.107	220	3.65	(mg) Total	Die Attach	% of Total Weigh	t0.75
A	mine type hardener	827-43-0	Die Attach	0.011	0.054	110			7440-22-4	73.36	5
	Dicyandiamide	461-58-5	Die Attach	0.002	0.009	18		Epoxy Resin		14.67	
	Silicon	7440-21-3	Chip (Die)	7.500	36.503	75,000		Diluent		7.33	
	Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.956	1,965		Phenolic hardener		2.93	
	Palladium	7440-05-3 7440-31-5 PI	Wire Bond palladium coated copper (CuPd)	0.004	0.017	35		Amine type hardener		1.47	
	Tin	7440-31-5 PI	ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	6.084	12,500		Dicyandiamide	461-58-5 Total	0.24 100.0 0	
			TOTALS:	100.000	486.700	1,000,000					
		0.4867 g	Total Mass				36.50	Total (mg)	Chip (Die)	% of Total Weigh	t 7.5
	e and its homogenous materials c of-Life Vehicles (ELV) Directive).	omply with EU Directive 200	02/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ctive) and with	h EU		Doped Silicon	7440-21-3	100	
Compliance with the above	e EU Directives has been verified	via internal design controls,	supplier declarations, and /or analytical test data.						Total	100.00	7
Incorporated's knowledge		ocument, there is no credibl	n intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concer wide.				0.97	(mg) Total	Wire Bond - Copper, palladium coated (CuPd)	% of Total Weigh	t 0.2
	by Microchip meet the UL94 V0 fl ages/offerings/industries/chemica		stics. You can access the UL iQTM family of databases to	o obtain a test	report at			Copper	7440-50-8	98	
The protective "tubes" in certain "reels" may be ma		ped are made from polyviny	I chloride (PVC) plastic. "Window envelopes" used to ho	old the packing	slip on the o	uter box and		Palladium	7440-05-3	2	
									Total	100.00	<u> </u>
their original packing mat- completeness and accura information is often prote- provided only as estimate	erials is true and correct to the be by of data in this form because it h ted from disclosure as trade secr	st of its knowledge and belie nas been compiled based or ets and some information m arts and the average weight	bstances restricted by RoHS in Microchip Technology Ir ôf, as of the date listed in this form. Microchip Technolog the ranges provided in Material Safety Data Sheets providay not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The) in the finished parts.	y Incorporate vided by raw n and raw mater	d cannot guar naterial suppli al suppliers. I	rantee the iers. Supplier Information is					
warranties provided by Mi			with respect to the information provided in this declarat tained in Microchip's standard terms and conditions of s				6.08	(mg) Total	Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	% of Total Weigh	t 1.25
otherwise, suffered by use		ne users' reliance on the info	Declarations and shall not be liable for any damages, di ormation in Material Content Declarations (MCD) or indep					Tin	7440-31-5	100.00	
								·	Total	100.00)
						•	486.70				100.000

P PA 08 PDIP 10:02 AM : 8/29/2013

Semiconductor Device	Type: OA and SN 08	(Lead) (SOIC) (Small Outline -150mil) (C2)		nation Base A	,		•	geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling e3
	<u> </u>	"Contained In"	% Total			62.24	(mg) Total	Mold Compound	% ot Total Weight	79.8
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm		Silica, vitreous	60676-86-0	86.91	
Silica, vitreous Epoxy Resin	60676-86-0 Trade Secret	Mold Compound Mold Compound	69.354 6.121	54.096 4.774	693,542 61,207		Epoxy Resin	Trade Secret	86.91 7.67	
Phenolic Resin	Trade Secret	Mold Compound	4.078	3.181	40.778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.193	2,474		Carbon Black	1333-86-4	0.31	
Copper	7440-50-8	Lead Frame	10.031	7.825	100,314			Total		
Iron	7439-89-6	Lead Frame	0.247	0.192	2,468	8.19	(mg) Total	Lead Frame	% of Total Weight	10.5
Silver	7440-22-4	Lead Frame	0,200	0.156	2,000		Copper	7440-50-8	95.54	
Zinc	7440-66-6	Lead Frame	0.013	0.010	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.007	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4	Die Attach	0.563	0.439	5,625		Zinc	7440-66-6	0.13	
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.082	1,050		Phosphorous	7723-14-0	0.08	
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.044	563		<u> </u>	Total	100.00	
Modified Amine	827-43-0	Die Attach	0.026	0.020	263	0.59	(mg) Total	Die Attach	% of Total Weight	0.75
Silicon	7440-21-3	Chip (Die)	7.500	5.850	75,000		Silver (Ag)	7440-22-4	75	
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.153	1,965		Modified Epoxy Resir	13561-08-5	14	
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.004	0.003	35	D	iglycidylether of bisphenol-F	54208-63-8	8	
Tin	7440-31-5 PI	ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.975	12,500		Modified Amine		4	
		TOTALS:	100.000	78.000	1,000,000					
		TOTALS.	100.000	70.000	1,000,000			Total	100.00	
	comply with EU Directive 200	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH				5.85	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weight	7.5
th EU Directive 2002/53/EC (End-of-Life Vehicles (ELV	comply with EU Directive 200 /) Directive).	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH				5.85		Chip (Die)	% of Total Weight	7.5
th EU Directive 2002/53/EC (End-of-Life Vehicles (ELV ance with the above EU Directives has been verified mical substance is absent from the list above, the ch prated's knowledge and belief as of the date of this di-	comply with EU Directive 200 /) Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, ereason to believe that the unavoidable impurity concer	IS Recast Dire	ctive, without	excemption)	0.16		Chip (Die) 7440-21-3	% of Total Weight	
ith EU Directive 2002/53/EC (End-of-Life Vehicles (ELV liance with the above EU Directives has been verified emical substance is absent from the list above, the ch lorated's knowledge and belief as of the date of this di s not below the threshold of regulatory concern for an ag compounds used by Microchip meet the UL94 V0 fi	comply with EU Directive 200 // Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-v lammability standard for plas	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, ereason to believe that the unavoidable impurity concer	S Recast Dire	f Microchip Techenical sub	excemption)		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium	% of Total Weight 100 100.00	
ith EU Directive 2002/53/EC (End-of-Life Vehicles (ELV liance with the above EU Directives has been verified emical substance is absent from the list above, the ch orated's knowledge and belief as of the date of this di s not below the threshold of regulatory concern for an ng compounds used by Microchip meet the UL94 V0 fl ul.com/global/eng/pages/offerings/industries/chemical rotective "tubes" in which the specific product is ship	comply with EU Directive 200 // Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-v lammability standard for plas ils/plastics/	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concervide.	IS Recast Dire	octive, without If Microchip Te chemical sub	echnology ostance, if		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd)	% of Total Weight 100 100.00 % of Total Weight	
th EU Directive 2002/53/EC (End-of-Life Vehicles (ELV iance with the above EU Directives has been verified emical substance is absent from the list above, the chorated's knowledge and belief as of the date of this dinot below the threshold of regulatory concern for an ag compounds used by Microchip meet the UL94 V0 fill.com/global/eng/pages/offerings/industries/chemica otective "tubes" in which the specific product is ship	comply with EU Directive 200 // Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-v lammability standard for plas ils/plastics/	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, a reason to believe that the unavoidable impurity concervide. stics. You can access the UL iQTM family of databases to	IS Recast Dire	octive, without If Microchip Te chemical sub	echnology ostance, if		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	% of Total Weight 100 100.00 % of Total Weight 98 2	
rith EU Directive 2002/53/EC (End-of-Life Vehicles (ELV diance with the above EU Directives has been verified the mical substance is absent from the list above, the character's knowledge and belief as of the date of this do is not below the threshold of regulatory concern for an ing compounds used by Microchip meet the UL94 V0 flul.com/global/eng/pages/offerings/industries/chemical rotective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic. chip Technology Incorporated believes the information original packing materials is true and correct to the be leteness and accuracy of data in this form because it I nation is often protected from disclosure as trade secreted only as estimates of the average weight of these p	comply with EU Directive 2007 // Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-v lammability standard for plas ls/plastics/ pped are made from polyviny n in this form concerning su st of its knowledge and belie has been compiled based on tets and some information m arts and the average weight	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, ereason to believe that the unavoidable impurity concervide. stics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hobbstances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets prov ynot have been provided by subcontract assemblers a of anticipated significant toxic metals components. The	IS Recast Dire to the best on tration of the oobtain a test old the packing the corporated's by Incorporate vided by raw rand raw mater	f Microchip Te chemical subtreport at g slip on the c semiconducted cannot guar naterial suppliers.	excemption) echnology stance, if outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3	% of Total Weight 100 100.00 % of Total Weight 98 2	
with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV pliance with the above EU Directives has been verified hemical substance is absent from the list above, the chrorated's knowledge and belief as of the date of this dis not below the threshold of regulatory concern for an ing compounds used by Microchip meet the UL94 V0 fl/ful.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information original packing materials is true and correct to the be oleteness and accuracy of data in this form because it mation is often protected from disclosure as trade secrided only as estimates of the average weight of these propants, metals, and non-metal materials contained within orchip Technology Incorporated does not provide any weight provide and weight of the provide and the provide	comply with EU Directive 2007 // Directive). via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-v lammability standard for plas als/plastics/ ped are made from polyviny in in this form concerning su st of its knowledge and belie has been compiled based on rets and some information m arts and the average weight in silicon devices (silicon IC) rarranty, express or implied,	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, ereason to believe that the unavoidable impurity concervide. stics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to hobbstances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets prov ynot have been provided by subcontract assemblers a of anticipated significant toxic metals components. The	IS Recast Dire to the best on tration of the oobtain a test old the packing accorporated by raw rand raw mater se estimates of the control o	f Microchip Te chemical subtreport at g slip on the c semiconducted cannot gual material suppliers. do not include usive, limited jusive, limi	excemption) echnology stance, if outer box and or devices in rantee the iers. Supplier information is trace levels		Doped Silicon (mg) Total Copper Palladium	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3	% of Total Weight 100 100.00 % of Total Weight 98 2	0.2
th EU Directive 2002/53/EC (End-of-Life Vehicles (ELV iance with the above EU Directives has been verified emical substance is absent from the list above, the chorated's knowledge and belief as of the date of this dinot below the threshold of regulatory concern for an ag compounds used by Microchip meet the UL94 V0 flul.com/global/eng/pages/offerings/industries/chemica otective "tubes" in which the specific product is ship in "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information riginal packing materials is true and correct to the beteness and accuracy of data in this form because it if ation is often protected from disclosure as trade secret only as estimates of the average weight of these pants, metals, and non-metal materials contained within the provided by Microchip Technology Incorporated tons, sales order acknowledgement, and invoices.	comply with EU Directive 200 In provided in the EU Directive 200 In provided in the EU Directive 200 In provided in the EU Directive 200 In in this form concerning su st of its knowledge and belie has been compiled based on rets and some information marts and the average weight in silicon devices (silicon IC) In a provided in the EU Direction IC Contractive III of the EU Direction II of the EU	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. Intentional ingredient in the semiconductor device and, e reason to believe that the unavoidable impurity concervide. stics. You can access the UL iQTM family of databases to a chloride (PVC) plastic. "Window envelopes" used to he betances restricted by RoHS in Microchip Technology In f., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets pro y not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declarat	IS Recast Dire to the best of other of the oobtain a test of the packing the packing of the pack	f Microchip Te chemical subtractive, without treport at g slip on the c semiconducted cannot gual material suppliers. do not include usive, limited perovided in tt, consequent	echnology potance, if puter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's	0.16	Doped Silicon (mg) Total Copper Palladium	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external lead: (pins) - Matte Tin / annealed at 150°C for 1	% of Total Weight 100 100.00 % of Total Weight 98 2	0.2

OA SN 08 SOIC 10:02 AM : 8/29/2013

CROCHIP				nation Base /	,		•	Package Homogeneous Materials: 8.1 Electronics (e.g. pc boards, displays)		
Semiconductor Device	Type: SM 08 (Lead) S	OIJ (Small Outline-208 mil) (C3)								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	99.27	(mg) Total	Mold Compound	% ot Total Weigh	t 79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	86,277	693,542		Silica, vitreous	60676-86-0	86.91	1
Epoxy Resin	Trade Secret	Mold Compound	6.121	7.614	61,207		Epoxy Resin	Trade Secret	7.67	1
Phenolic Resin	Trade Secret	Mold Compound	4.078	5.073	40,778		Phenolic Resin	Trade Secret	5.11	
Carbon Black	1333-86-4	Mold Compound	0.247	0.308	2.474		Carbon Black	1333-86-4	0.31	1
Copper	7440-50-8	Lead Frame	10.031	12,479	100,314		Carbon Black	Total	0.0.	<u></u>
Iron	7439-89-6	Lead Frame	0.247	0.307	2.468	13.06	(mg) Total	Lead Frame	% of Total Weigh	
Silver	7440-22-4	Lead Frame	0.200	0.249	2,000	13.00		7440-50-8	95.54	10.5
Zinc	7440-22-4	Lead Frame	0.200	0.249	131		Copper	7440-50-8 7439-89-6		
							Iron		2.35	4
Phosphorous	7723-14-0	Lead Frame	0.009	0.011	87		Silver	7440-22-4	1.91	
Silver (Ag)	7440-22-4 13561-08-5	Die Attach	0.563 0.105	0.700 0.131	5,625		Zinc	7440-66-6	0.13 0.08	
Modified Epoxy Resin		Die Attach			1,050		Phosphorous	7723-14-0		Ţ
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.070	563			Total		
Modified Amine	827-43-0	Die Attach	0.026	0.033	263	0.93	(mg) Total	Die Attach	% of Total Weigh	t 0.75
Silicon	7440-21-3	Chip (Die)	7.500	9.330	75,000		Silver (Ag)	7440-22-4	75	
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.244	1,965		Modified Epoxy Resin	13561-08-5	14	
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.004	0.004	35		Diglycidylether of bisphenol-F	54208-63-8	8	
Tin	7440-31-5 Pla	ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	1.555	12,500		Modified Amine		4	
		TOTALS:	100.000	124.400	1,000,000			Total	100.00)
	0.1244 g	Total Mass				9.33				
		2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	S Recast Dire	ctive) and wit	h EU	9.33	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weigh	t 7.5
2002/53/EC (End-of-Life Vehicles (ELV) Directive). nce with the above EU Directives has been verified nical substance is absent from the list above, the ch	comply with EU Directive 200 via internal design controls, nemical substance is NOT an	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and	, to the best o	f Microchip Te	echnology		Doped Silicon	7440-21-3 Total Wire Bond -	100.00	
2002/53/EC (End-of-Life Vehicles (ELV) Directive). nce with the above EU Directives has been verified nical substance is absent from the list above, the clared's knowledge and belief as of the date of this dot below the threshold of regulatory concern for an	via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer	, to the best o	f Microchip Te chemical sub	echnology	0.25	1	7440-21-3 Total	100	
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified mical substance is absent from the list above, the che rated's knowledge and belief as of the date of this d not below the threshold of regulatory concern for an grompounds used by Microchip meet the UL94 V0 fi	comply with EU Directive 200 via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w lammability standard for plas	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer	, to the best o	f Microchip Te chemical sub	echnology		Doped Silicon	7440-21-3 Total Wire Bond - Copper, palladium	100.00	
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified mical substance is absent from the list above, the charted's knowledge and belief as of the date of this d not below the threshold of regulatory concern for an g compounds used by Microchip meet the UL94 V0 fil. Loom/global/eng/pages/offerings/industries/chemica btective "tubes" in which the specific product is ship	comply with EU Directive 200 via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w lammability standard for plas ils/plastics/	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity concer	, to the best ontration of the	f Microchip To chemical sub t report at	echnology sstance, if		Doped Silicon (mg) Total	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3	100 100.0i % of Total Weigh	0.2
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified mical substance is absent from the list above, the charted's knowledge and belief as of the date of this d not below the threshold of regulatory concern for an g compounds used by Microchip meet the UL94 V0 fl. Loom/global/eng/pages/offerings/industries/chemica bective "tubes" in which the specific product is ship "reels" may be made from PVC plastic. hip Technology Incorporated believes the informatio iginal packing materials is true and correct to the be teness and accuracy of data in this form because it in this often protected from disclosure as trade sected only as estimates of the average weight of these p	via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-wammability standard for plastis/plastics/ ped are made from polyvinyl in in this form concerning sul st of its knowledge and belie has been compiled based on rets and some information marts and the average weight	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity concertide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he constances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provuled in waterial Safety Data Sheets provuled have been provided by subcontract assemblers a of anticipated significant toxic metals components. The	, to the best o ntration of the o obtain a test old the packing ncorporated's yJ Incorporate vided by raw r and raw mater	f Microchip To chemical sub treport at g slip on the co semiconduct d cannot gua material suppliers.	echnology istance, if outer box and or devices in rantee the iers. Supplier information is		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	100 100.0i % of Total Weigh	0.2
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified mical substance is absent from the list above, the charted's knowledge and belief as of the date of this d not below the threshold of regulatory concern for an g compounds used by Microchip meet the UL94 V0 fl.com/global/eng/pages/offerings/industries/chemicatective "tubes" in which the specific product is ship "reels" may be made from PVC plastic. Inip Technology Incorporated believes the informatio gignal packing materials is true and correct to the beteness and accuracy of data in this form because it it tion is often protected from disclosure as trade sected only as estimates of the average weight of these pints, metals, and non-metal materials contained with hip Technology Incorporated does not provide any wites provided by Microchip Technology Incorporated	via internal design controls, nemical substance is NOT an occument, there is no credible y regulatory scheme world-watermability standard for plastis/plastics/ uped are made from polyvinyl in in this form concerning sulst of its knowledge and belie has been compiled based on rets and some information marts and the average weight in silicon devices (silicon IC)	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity concertide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he constances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provuled in waterial Safety Data Sheets provuled have been provided by subcontract assemblers a of anticipated significant toxic metals components. The	to the best on tration of the oo obtain a test old the packing accorporated's gy Incorporate vided by raw rand raw mater see estimates of the output of the	f Microchip To chemical sub treport at g slip on the c semiconduct d cannot gua naterial suppli ial suppliers. do not include usive, limited i	postance, if puter box and or devices in rantee the iers. Supplier information is e trace levels		Doped Silicon (mg) Total Copper	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3	100 100.0i % of Total Weigh	0.2
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive). iance with the above EU Directives has been verified emical substance is absent from the list above, the character's knowledge and belief as of the date of this directives has been verified emical substance is absent from the list above, the character's knowledge and belief as of the date of this directive in the threshold of regulatory concern for an given common content of the complete o	via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w lammability standard for plas lis/plastics/ pped are made from polyvinyl in in this form concerning sul st of its knowledge and belie has been compiled based on rets and some information marts and the average weight in silicon devices (silicon IC) varranty, express or implied, and its subsidiaries are conceptanges to Material Content the users' reliance on the info	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity concertide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he constances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets proy not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The in the finished parts.	to the best on tration of the oo obtain a test old the packing the occupant of the packing	f Microchip To chemical sub treport at g slip on the of semiconduct d cannot gua naterial suppliad ial suppliers. do not include usive, limited i e provided in	echnology stance, if outer box and or devices in rantee the iers. Supplier Information is trace levels product Microchip's	0.25	Doped Silicon (mg) Total Copper Palladium	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	98 2 100.00	0.2
we 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iance with the above EU Directives has been verified emical substance is absent from the list above, the character's knowledge and belief as of the date of this donot below the threshold of regulatory concern for an goompounds used by Microchip meet the UL94 V0 fil. I.com/global/eng/pages/offerings/industries/chemicatotective "tubes" in which the specific product is ship "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information in the process and accuracy of data in this form because it thation is often protected from disclosure as trade sected only as estimates of the average weight of these pants, metals, and non-metal materials contained with thip Technology Incorporated does not provide any we ties provided by Microchip Technology Incorporated ons, sales order acknowledgement, and invoices. Thip disclaims any duty to notify users of updates or dise, suffered by users or third parties as a result of the suffered b	via internal design controls, nemical substance is NOT an ocument, there is no credible y regulatory scheme world-w lammability standard for plas lis/plastics/ pped are made from polyvinyl in in this form concerning sul st of its knowledge and belie has been compiled based on rets and some information marts and the average weight in silicon devices (silicon IC) varranty, express or implied, and its subsidiaries are conceptanges to Material Content the users' reliance on the info	2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity concertide. titics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he constances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets provided in Material Safety Data Sheets provided by subcontract assemblers a of anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declarate tained in Microchip's standard terms and conditions of subcelarations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations and shall not be liable for any damages, diese and several supplementations are supplementations.	to the best on tration of the oo obtain a test old the packing the occupant of the packing	f Microchip To chemical sub treport at g slip on the of semiconduct d cannot gua naterial suppliad ial suppliers. do not include usive, limited i e provided in	echnology stance, if outer box and or devices in rantee the iers. Supplier Information is trace levels product Microchip's	0.25	Doped Silicon (mg) Total Copper Palladium (mg) Total	7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	100 100.00 % of Total Weight 98 2 100.00 % of Total Weight	ot 0.2

SM 8 SOIJ_SOIC 10:02 AM : 8/29/2013

ICROCHIP				nation Base /	,		•	geneous Materials: _I . pc boards, displays	s)	JEDEC 97 Product Markin and/or Pkg. Labeling
Semiconductor Device	Type: CT and OT 05	(Lead) SOT-23 (C7)								e3
		"Contained In"	% Total							
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	12.77	(mg) Total	Mold Compound	% ot Total Weigh	it 79.8
Silica vitreous	60676-86-0	Mold Compound	69.354	11.097	693,542		Silica, vitreous	60676-86-0	86.91	T
Epoxy Resin	Trade Secret	Mold Compound	6.121	0.979	61,207		Epoxy Resin	Trade Secret	7.67	1
Phenolic Resin	Trade Secret	Mold Compound	4.078	0.652	40,778		Phenolic Resin	Trade Secret	5.11	1
Carbon Black	1333-86-4	Mold Compound	0.247	0.040	2.474		Carbon Black	1333-86-4	0.31	1
Copper	7440-50-8	Lead Frame	10.031	1.605	100,314		U	Total	100.00)
Iron	7439-89-6	Lead Frame	0.247	0.039	2,468	1.68	(mg) Total	Lead Frame	% of Total Weigh	t 10.5
Silver	7440-22-4	Lead Frame	0.200	0.032	2,000	1.00	Copper	7440-50-8	95.54	1
Zinc	7440-66-6	Lead Frame	0.200	0.002	131		Iron	7439-89-6	2.35	1
Phosphorous	7723-14-0	Lead Frame	0.009	0.002	87		Silver	7440-22-4	1.91	1
Silver (Aq)	7440-22-4	Die Attach	0.563	0.090	5,625		Zinc	7440-66-6	0.13	1
Modified Epoxy Resin	13561-08-5	Die Attach	0.105	0.030	1.050		Phosphorous	7723-14-0	0.13	1
Diglycidylether of bisphenol-F	54208-63-8	Die Attach	0.056	0.009	563		Т поэрпогоиз	Total	0.00	_
Modified Amine	827-43-0	Die Attach	0.026	0.004	263	0.12	(mg) Total	Die Attach	% of Total Weigh	
Silicon	7440-21-3	Chip (Die)	7.500	1.200	75,000	0.12		7440-22-4		0.73
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.031	1.965		Silver (Ag) Modified Epoxy Resin	13561-08-5	75 14	1
Palladium	7440-05-3		0.197	0.001	35		iglycidylether of bisphenol-F	54208-63-8		-
Tin		Wire Bond palladium coated copper (CuPd) ting on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.200	12,500	L	Modified Amine	827-43-0	8	-
1111	7440-31-3 Pla			16.000			Woulled Affille			
		TOTALS:	100.000	16.000	1,000,000			Total		
miconductor device and its homogenous materials c		Total Mass				1.20	Total (mg)	Total Chip (Die)	% of Total Weigh	
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	omply with EU Directive 2002	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH				1.20	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weigh	nt 7.5
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	omply with EU Directive 2002	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH				1.20	1	Chip (Die)	% of Total Weigh	t 7.5
e 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Ince with the above EU Directives has been verified venical substance is absent from the list above, the charact's knowledge and belief as of the date of this do	omply with EU Directive 200; via internal design controls, emical substance is NOT an cument, there is no credible	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohsupplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conce	IS Recast Dire	ective) and wit	ch EU	0.03	1	Chip (Die) 7440-21-3	% of Total Weigh	7.5
re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified venical substance is absent from the list above, the charated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any grompounds used by Microchip meet the UL94 V0 flag.	omply with EU Directive 200: via internal design controls, emical substance is NOT an coument, there is no credible regulatory scheme world-w immability standard for plas	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohsupplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conce	IS Recast Dire	ective) and wit of Microchip To the chemical sub	ch EU		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium	% of Total Weigh	7.5
we 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified we mical substance is absent from the list above, the chorated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any g compounds used by Microchip meet the UL94 V0 fia L.com/global/eng/pages/offerings/industries/chemical otective "tubes" in which the specific product is shipp	omply with EU Directive 200: via internal design controls, emical substance is NOT an cument, there is no credible regulatory scheme world-w immability standard for plas s/plastics/	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohsupplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide.	IS Recast Dire	octive) and wit of Microchip To ochemical sub treport at	echnology ostance, if		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd)	% of Total Weigh	7.5
ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive). iance with the above EU Directives has been verified vehicles in the list above, the chorated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any g compounds used by Microchip meet the UL94 V0 flat. I.com/global/eng/pages/offerings/industries/chemical otective "tubes" in which the specific product is shipp "reels" may be made from PVC plastic. hip Technology Incorporated believes the information riginal packing materials is true and correct to the besteness and accuracy of data in this form because it hation is often protected from disclosure as trade secreted only as estimates of the average weight of these peters.	omply with EU Directive 200: via internal design controls, emical substance is NOT an cument, there is no credible regulatory scheme world-w ummability standard for plas s/plastics/ ped are made from polyvinyl in this form concerning sub t of its knowledge and belie as been compiled based on sits and some information mi tris and the average weight i	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conce ide. tics. You can access the UL iQTM family of databases of chloride (PVC) plastic. "Window envelopes" used to he ostances restricted by RoHS in Microchip Technology I f, as of the date listed in this form. Microchip Technolo the ranges provided in Material Safety Data Sheets pro yor have been provided by subcontract assemblers of anticipated significant toxic metals components. The	IS Recast Dire , to the best o ntration of the o obtain a test old the packing ncorporated's yy Incorporate vided by raw r and raw mater	octive) and with the chemical substitute of the chemical substitute of the chemical suppliers.	echnology stance, if outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	% of Total Weigh 100 100.00 % of Total Weigh 98	7.5 ot 7.5
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified vemical substance is absent from the list above, the chorated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any ng compounds used by Microchip meet the UL94 V0 fit ul.com/global/eng/pages/offerings/industries/chemical ortective "tubes" in which the specific product is shipp neets may be made from PVC plastic. Thip Technology Incorporated believes the information riginal packing materials is true and correct to the beseteness and accuracy of data in this form because it hation is often protected from disclosure as trade secreted only as estimates of the average weight of these parants, metals, and non-metal materials contained within this Technology Incorporated does not provide any watties provided by Microchip Technology Incorporated	omply with EU Directive 200: via internal design controls, emical substance is NOT an cument, there is no credible regulatory scheme world-w immability standard for plas s/plastics/ ped are made from polyvinyl in this form concerning sub t of its knowledge and belie as been compiled based on ints and some information ma ints and the average weight in silicon devices (silicon IC) erranty, express or implied, in	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (Rohs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conce ide. tics. You can access the UL iQTM family of databases of chloride (PVC) plastic. "Window envelopes" used to he ostances restricted by RoHS in Microchip Technology I f, as of the date listed in this form. Microchip Technolo the ranges provided in Material Safety Data Sheets pro yor have been provided by subcontract assemblers of anticipated significant toxic metals components. The	IS Recast Dire to the best of the obtain a test of the packing t	of Microchip To chemical sub treport at g slip on the co semiconducted cannot gua material suppli ial suppliers. do not include	echnology potance, if puter box and or devices in rantee the liers. Supplier Information is e trace levels		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3	% of Total Weigh 100 100.00 % of Total Weigh 98 2	7.5 ott 7.5
ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified a emical substance is absent from the list above, the chorated's knowledge and belief as of the date of this do not below the threshold of regulatory concern for any ag compounds used by Microchip meet the UL94 Vo flaul.com/global/eng/pages/offerings/industries/chemical rotective "tubes" in which the specific product is shipp a "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information riginal packing materials is true and correct to the besteness and accuracy of data in this form because it heation is often protected from disclosure as trade secreted only as estimates of the average weight of these parants, metals, and non-metal materials contained within this provided by Microchip Technology Incorporated contained within the provided by Microchip Technology Incorporated tions, sales order acknowledgement, and invoices.	omply with EU Directive 200: via internal design controls, emical substance is NOT an cument, there is no credible regulatory scheme world-w immability standard for plas s/plastics/ bed are made from polyvinyl in this form concerning sub- it of its knowledge and belie as been compiled based on ets and some information mi- ints and the average weight in silicon devices (silicon IC) arranty, express or implied, vand its subsidiaries are cont thanges to Material Content I e users' reliance on the infor	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and reason to believe that the unavoidable impurity conceide. tics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he ostances restricted by RoHS in Microchip Technology I f, as of the date listed in this form. Microchip Technology I the ranges provided in Material Safety Data Sheets pro y not have been provided by subcontract assemblers of anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declara	IS Recast Dire I, to the best o Intration of the Intration of t	of Microchip To the chemical sub- treport at g slip on the co- semiconducted cannot gua- material suppliers. do not include usive, limited in the provided in	echnology postance, if pouter box and por devices in rantee the liers. Supplier Information is e trace levels product Microchip's tial or	0.03	Doped Silicon (mg) Total Copper Palladium	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 7440-05-3 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	% of Total Weigh 100 100.00 % of Total Weigh 98 2 100.00 % of Total Weigh	7.5 of the total o

CT OT 5 SOT-23 10:02 AM : 8/29/2013

CROCHIP				nation Base /	,		•	geneous Materials: g. pc boards, displays	s)	JEDEC 97 Product Marking and/or Pkg. Labeling
Semiconductor Device Type	e: CH and OT 06									e3
		"Contained In"	% Total			13.57	, , , , , ,			
Basic Substance	CAS Number	Sub-Component	Weight	mg/part	ppm	13.57	(mg) Total	Mold Compound	% ot Total Weigh	79.8
Silica, vitreous	60676-86-0	Mold Compound	69.354	11.790	693,542		Silica, vitreous	60676-86-0	86.91	
Epoxy Resin (No bromine, No diantimony trioxide)	Trade Secret	Mold Compound	6.121	1.041	61,207		Epoxy Resin	Trade Secret	7.67	1
Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)	Trade Secret	Mold Compound	4.078	0.693	40,778		Phenolic Resin	Trade Secret	5.11	1
Carbon Black	1333-86-4	Mold Compound	0.247	0.042	2,474		Carbon Black	1333-86-4	0.31	1
Copper	7440-50-8	Lead Frame	10.031	1.705	100,314			Total	100.00	
Iron	7439-89-6	Lead Frame	0.247	0.042	2,468	1.79	(mg) Total	Lead Frame	% of Total Weigh	10.5
Silver	7440-22-4	Lead Frame	0.200	0.034	2,000	143	Copper	7440-50-8	95.54	10.0
Zinc	7440-66-6	Lead Frame	0.013	0.002	131		Iron	7439-89-6	2.35	
Phosphorous	7723-14-0	Lead Frame	0.009	0.002	87		Silver	7440-22-4	1.91	ł
Epoxy resin	Trade Secret	Die Attach	0.563	0.096	5,625		Zinc	7440-66-6	0.13	ł
Silicon dioxide	Trade Secret	Die Attach	0.169	0.029	1,688		Phosphorous	7723-14-0	0.08	ł
Silicon dioxide	Polymeric Retanning	Die Attacii	0.103	0.023	1,000		Filospilolous	Total		ļ
Curing / Hardener	Agent	Die Attach	0.019	0.003	188			TOTAL	100.00	
Silicon	7440-21-3	Chip (Die)	7.500	1,275	75,000	0.13	(mg) Total	Die Attach	% of Total Weigh	0.75
Copper	7440-50-8	Wire Bond palladium coated copper (CuPd)	0.197	0.033	1.965		Epoxy resin	Trade Secret	75	
Palladium	7440-05-3	Wire Bond palladium coated copper (CuPd)	0.004	0.001	35		Silicon dioxide	7631-86-9	23	
Tin		ating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour	1.250	0.213	12,500		Curing / Hardener	Trade Secret	3	-
	7440 01 0 11			17.000	1.000.000		Odning / Hardener	Total		<u> </u>
1111		TOTAL C.								
		TOTALS:	100.000	17.000	1,000,000			1		
iconductor device and its homogenous materials comply		Total Mass				1.28	Total (mg) Doped Silicon	Chip (Die) 7440-21-3	% of Total Weigh	
emiconductor device and its homogenous materials comply ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). liance with the above EU Directives has been verified via int	y with EU Directive 200	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data.	dS Recast Dire	ective) and wit	h EU	1.28		Chip (Die)	% of Total Weigh	7.5
miconductor device and its homogenous materials comply e 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via int mical substance is absent from the list above, the chemica rated's knowledge and belief as of the date of this docume	y with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and ereason to believe that the unavoidable impurity concer	IS Recast Dire	ective) and wit	h EU	0.03		Chip (Die) 7440-21-3	% of Total Weigh	7.5
miconductor device and its homogenous materials comply re 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ance with the above EU Directives has been verified via int mical substance is absent from the list above, the chemica rated's knowledge and belief as of the date of this docume not below the threshold of regulatory concern for any regulg compounds used by Microchip meet the UL94 V0 flamma	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible ulatory scheme world-v ability standard for plas	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceivide.	IS Recast Dire	ective) and wit of Microchip To ochemical sub	h EU		Doped Silicon	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium	% of Total Weigh	7.5
emiconductor device and its homogenous materials comply ve 2002/53/EC (End-of-Life Vehicles (ELV) Directive).	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no crediblulatory scheme world-v ubility standard for plas stics/	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceivide. stics. You can access the UL iQTM family of databases to	IS Recast Dire	octive) and wit of Microchip To ochemical sub t report at	h EU echnology stance, if		Doped Silicon (mg) Total	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd)	% of Total Weigh 100 100.00 % of Total Weigh	7.5
emiconductor device and its homogenous materials comply ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intermical substance is absent from the list above, the chemical orated's knowledge and belief as of the date of this docume to the below the threshold of regulatory concern for any regular compounds used by Microchip meet the UL94 V0 flammaul.com/global/eng/pages/offerings/industries/chemicals/plastotective "tubes" in which the specific product is shipped and	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible illatory scheme world-v ability standard for plas stics/ re made from polyviny is form concerning su is knowledge and belie een compiled based on ind some information m ind the average weight	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and e reason to believe that the unavoidable impurity conceivide. stics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to he be be the conceived in this form. Microchip Technology In f., as of the date listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The	IS Recast Dire I, to the best ontration of the so obtain a test old the packing ncorporated's gy Incorporate vided by raw r and raw mater	of Microchip To chemical sub t report at g slip on the c semiconduct d cannot gua material suppl ial suppliers.	h EU echnology stance, if outer box and or devices in rantee the liers. Supplier Information is		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	% of Total Weigh 100 100.00 % of Total Weigh 98	0.2
emiconductor device and its homogenous materials comply ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intermice with the above EU Directives has been verified via intermice in the list above, the chemical orated's knowledge and belief as of the date of this docume into below the threshold of regulatory concern for any regular compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/plast otective "tubes" in which the specific product is shipped an "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information in the riginal packing materials is true and correct to the best of it eteness and accuracy of data in this form because it has be ation is often protected from disclosure as trade secrets an ed only as estimates of the average weight of these parts an ants, metals, and non-metal materials contained within silic chip Technology Incorporated does not provide any warrant tities provided by Microchip Technology Incorporated and it ions, sales order acknowledgement, and invoices.	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible latory scheme world-v ability standard for plas stics/ ere made from polyviny is form concerning su is knowledge and belie ten compiled based on d some information m nd the average weight con devices (silicon Ic) ty, express or implied, is subsidiaries are con	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHs supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceivide. stics. You can access the UL iQTM family of databases to the chloride (PVC) plastic. "Window envelopes" used to be bestances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology the ranges provided in Material Safety Data Sheets pro ay not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declarated in Microchip's standard terms and conditions of the supplementations.	IS Recast Dire I, to the best o intration of the co obtain a test old the packing incorporated's gy Incorporate vided by raw r and raw mater ese estimates of tion. The exclusiale. These ar	octive) and with the control of Microchip To chemical subtrace and the control of	h EU achnology stance, if buter box and or devices in rantee the liers. Supplier Information is e trace levels product Microchip's		Doped Silicon (mg) Total Copper	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8	% of Total Weigh 100 100.00 % of Total Weigh 98	0.2
emiconductor device and its homogenous materials comply ive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Iliance with the above EU Directives has been verified via intermice with the above EU Directives has been verified via intermice in the list above, the chemical orated's knowledge and belief as of the date of this docume into below the threshold of regulatory concern for any regular compounds used by Microchip meet the UL94 V0 flamma ul.com/global/eng/pages/offerings/industries/chemicals/plastotective "tubes" in which the specific product is shipped an "reels" may be made from PVC plastic. Thip Technology Incorporated believes the information in the riginal packing materials is true and correct to the best of it eteness and accuracy of data in this form because it has beation is often protected from disclosure as trade secrets an ed only as estimates of the average weight of these parts a ants, metals, and non-metal materials contained within silicathip Technology Incorporated does not provide any warrant tites provided by Microchip Technology Incorporated and it	with EU Directive 200 ternal design controls, al substance is NOT an ent, there is no credible ulatory scheme world-ve ability standard for plas stics/ re made from polyviny his form concerning su ts knowledge and belie een compiled based on ad some information m and the average weight con devices (silicon IC) ty, express or implied, is subsidiaries are con es to Material Content	Total Mass 2/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS supplier declarations, and /or analytical test data. intentional ingredient in the semiconductor device and a reason to believe that the unavoidable impurity conceivide. stics. You can access the UL iQTM family of databases to chloride (PVC) plastic. "Window envelopes" used to be betances restricted by RoHS in Microchip Technology Inf., as of the date listed in this form. Microchip Technology Inf. as of the date listed in this form. Microchip Technology Inf. are provided in Material Safety Data Sheets proay not have been provided by subcontract assemblers a of anticipated significant toxic metals components. The in the finished parts. with respect to the information provided in this declarat tained in Microchip's standard terms and conditions of Declarations and shall not be liable for any damages, di	IS Recast Dire I, to the best of intration of the Is o obtain a test Is obtain a	of Microchip To chemical subtraction of the common of the	h EU echnology stance, if outer box and or devices in rantee the iters. Supplier Information is trace levels product Microchip's	0.03	Doped Silicon (mg) Total Copper Palladium	Chip (Die) 7440-21-3 Total Wire Bond - Copper, palladium coated (CuPd) 7440-50-8 Total Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1	% of Total Weigh 100 100.00 % of Total Weigh 98 2 100.00	0.2

CH OT_06-SOT-23 NC 10:02 AM : 8/29/2013

Salica vinerama (CAS Number) source (CAS Numbe	Y Package Homogeneous Materials I ar		on Base Alloy: r Alloy (Cu)		TQFP 10x10x1mm (T4/TY)	Type: PT 44 (Lead)	AICROCHIP Semiconductor Device
Silica viteous 60076-86-0 Mold Compound 60.354 190.545 603.547 Epony Reain 1766-86-0 Mold Compound 4.076 11.145 40.778 Carbon Black 1333-86-4 Mold Compound 4.076 11.145 40.778 Nickal 1740-05-0 Load Frame 10.000 27.331 10.003 Nickal 1740-05-0 Load Frame 10.000 27.331 10.003 Silicon 1740-21-3 Load Frame 0.0.077 0.128 1.0567 Marganiam 1740-95-6 Load Frame 0.0.077 0.128 1.0567 Marganiam 1740-95-7 0.0568 1.0568	ppm 218.09 (mg) Total Mold Compound % ot Total Weight	218.09	mg/part ppm			CAS Number	Basic Substance
Epoxy Resin Trade Secret Mold Compound 6,121 16,728 61,977 Phenolic Resin Trade Secret Mold Compound 4,778 11,145 40,728 Carbon Black 1333-86-4 Mold Compound 0,247 0,676 2,474 Carbon Black 1333-86-4 Mold Compound 0,247 0,733 10,000 Carbon Black 1333-86-4 Mold Compound 0,247 0,733 10,000 Carbon Black 1333-86-4 Carbon Black			<u> </u>		Mold Compound		
Phenoic Rean							
Copper 7440-90-9 Lead Frame 10,000 27,313 100,003 100,	40,778 Phenolic Resin Trade Secret 5.11	8	11.145 40,778	4.078		Trade Secret	Phenolic Resin
Nickel 7440-02-0 Lead Frame 0.0767 0.729 2.667 28.70 (mg) Total Lead Frame 9.0176 1.752 1.0479 1.752 1.0479 1.752 1.0479 1.752 1.0479 1.752 1.0479 1.752 1.0479 1.752 1.0479 1.752 1.053 1				0.247			Carbon Black
Silver 7440:22-4 Lead Frame 0.075 0.479 1.752 Silcon 7440:23-3 Lead Frame 0.047 0.129 473 473 473 4740:24-4 Die Attach 0.000 1.400 1.0029 1.005 Silver 7440:24-1 Die Attach 0.000 1.	100,003 Total 100.00	03	27.331 100,003	10.000	Lead Frame	7440-50-8	Copper
Silver 7440-22-4 Lead Frame 0.475 0.479 1.752 Copper 7440-90-8 9-9 Silver 7440-21-3 Lead Frame 0.047 0.129 473 Silver 7440-22-4 Die Attach 0.000 1.040 0.000 1.040 0.000 Silver 7440-22-4 Die Attach 0.000 1.040 0.000 0.000 0.000 Silver 7440-22-4 Die Attach 0.000 1.040 0.000 0.000 0.000 0.000 0.000 Silver 7440-22-4 Die Attach 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Silver 7440-21-3 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Silver 7440-91-8 Wire Bond palladium coated copper (CuPrd) 0.004 0.010 35 0.000	2,667 28.70 (mg) Total Lead Frame % of Total Weight	7 28.70	0.729 2,667	0.267	Lead Frame	7440-02-0	Nickel
Silicon 7440-21-3 Lead Frame 0.011 0.029 105 Silver (Ag) 7459-95-4 Lead Frame 0.011 0.029 105 Silver (Ag) 7440-22-4 Die Attach 0.600 1.640 0.000 1.640			0.479 1.752	0.175	Lead Frame	7440-22-4	Silver
Magnesium 7439-95-4 Lead Frame 0.011 0.029 105 Silver 7440-22-4 Die Attach 0.0500 1.640 5.000 Acrysted Urehane Oligomer General Die Attach 0.150 0.410 1.500 Silicon 7440-21-3 Copper 7440-50-8 Wire Bond palladium coated copper (CuPs) 7500 2.048 75,000 Total 7440-51-3 Palladium 7440-05-3 Wire Bond palladium coated copper (CuPs) 7460-750 2.048 75,000 Total 7460-751 Palladium 7440-05-3 Wire Bond palladium coated copper (CuPs) 7460-751 Palladium 7440-751 Palladium 7440-							
Acrylate Urethane Oligomer General Die Attach 0.150 0.410 1.500 Silicon 7440-21-3 Who Palladium Color Copper 7440-9-8 Wire Bord palladium coated copper (CuPd) 0.197 0.537 1.965 2.05 (mg) Total Die Attach % of 1 Total Palladium 7440-95-8 Wire Bord palladium coated copper (CuPd) 0.004 0.010 35 Silicon 7440-95-1 Plating on external leads (pine) - Mater Tin / presented at 150°C for 1 hour 120°C lead of 1 to 1							
Silicon 7440-21-3 Wire Bond palladium coated copper (CuPit) 0.197 0.537 1.965 Pelladium 7440-55-3 Wire Bond palladium coated copper (CuPit) 0.197 0.537 1.965 Pelladium 7440-55-3 Wire Bond palladium coated copper (CuPit) 0.004 0.010 35 Tin 7440-31-5 Plating on external leads piese) - Mater Tin / annealed at 1507 for 1 to 100.000 273.300 1,000,000 O.273.30 Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). O.273.3 g Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). But Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). But Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). In palladium 7440-31-5 Plating on external leads (Policy Comporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if yill not below the threshold of requistory concern for any regulatory concern for any regulatory scheme world-wide. Oxper (CuPA) In palladium 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). Oxper (CuPA) In palladium 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). In palladium 2002/95/EC (Rod-Of-Life Ve				0.600			
Silicon 7440-21-3 Wire Bond palladium coated copper (CuPit) 0.197 0.537 1.965 Pelladium 7440-55-3 Wire Bond palladium coated copper (CuPit) 0.197 0.537 1.965 Pelladium 7440-55-3 Wire Bond palladium coated copper (CuPit) 0.004 0.010 35 Tin 7440-31-5 Plating on external leads piese) - Mater Tin / annealed at 1507 for 1 to 100.000 273.300 1,000,000 O.273.30 Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). O.273.3 g Total Mass is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). But Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). But Directive 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). In palladium 7440-31-5 Plating on external leads (Policy Comporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if yill not below the threshold of requistory concern for any regulatory concern for any regulatory scheme world-wide. Oxper (CuPA) In palladium 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). Oxper (CuPA) In palladium 2002/95/EC (Rod-Of-Life Vehicles (EUV) Directive). In palladium 2002/95/EC (Rod-Of-Life Ve							
Copper (7440-50-8) Wire Bond pelladium coated copper (CUPd) 0.094 0.010 35 Pelladium 7440-93-1-5 Plating on external leads (pres) - Mellate Tin / annealed at 150°C for 1 hos 1.250 3.416 12.500 TOTALS: 100.000 273.30 1,000,000 TOTALS: 100.000 273.000,000 TOTALS: 100.000 273.30 1,000,000 TOTALS: 100.000,000 TOTALS:							
Palladium 7440-05-3 Wire Bond palladium causted copper (CUPd) 0.004 0.010 35 Tin 7440-31-5 Pating on external leads (prin) - Mater Tin / amended at 150°C for 1 hod 1.250 0.34.16 12,500 0.000 273.300 1,000,000 TOTALS: 100.000 273.300 TOT							
Tin 7440-31-5 Plating on external leads (pins) - Matter Tin / annealed at 150°C for 1 nou 1.250					1 11 7		· · · · · · · · · · · · · · · · · · ·
O.2733 g Total Mass O.273 g Total Mass O.274 (Fights Package Lip Andrew Lip A							
0.2733 g Total Mass 0.273 g Total Mass 20.50 Total (mg) Chip (Die) % of Total (mg) Chip (Die) (mg) Chip (mg) C						71.00.0	
Is semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoHS Recast Directive) and with EU Doped Silicon T440-21-3	1,000,000		273.300 1,000,00	100.000			
poped Silicon 7440-21-3 Total Chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology orporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if (is not below the threshold of regulatory concern for any regulatory scheme world-wide. Iding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at 20//ul.com/global/eng/pages/offerings/industries/chemicals/plastics/s protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "reels" may be made from PVC plastic. Total Copper 7440-50-8 Palladium 7440-05-3 Total Palladium 7440-05-3 Total Palladium 7440-05-3 Palladium	20.50 Total (mg) Chip (Die) % of Total Weight	20.50			g Lotal Mass	0.2733	
chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology opporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if palladium coated copper (CuPd) (mg) Total palladium co					0		
proprorated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if is not below the threshold of regulatory concern for any regulatory scheme world-wide. ding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at concerning simulations of the complete the unavoidable ing/pages/offerings/industries/chemicals/plastics/ protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "reels" may be made from PVC plastic. Total T			e) and with EU	IS Recast Direc	0		
p://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/ e protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and tain "reels" may be made from PVC plastic. Total Tot	Doped Silicon 7440-21-3 100		e) and with EU	IS Recast Direc	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH	omply with EU Directive 2	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).
Total To	Doped Silicon		crochip Technology	, to the best of	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concer	omply with EU Directive 2 via internal design contro memical substance is NOT ocument, there is no cred	ctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). ppliance with the above EU Directives has been verified chemical substance is absent from the list above, the ch proprated's knowledge and belief as of the date of this di
rochip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in rodiginal packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the pleteness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier rmation is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is vided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels opants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts. Plating on external leads (pins) - Matter Tin / % of Tattions estees order acknowledgement and invoices.	Doped Silicon 7440-21-3 100 Total 100.00 nnology ance, if 0.55 (mg) Total Palladium coated copper (CuPd) Total Weight Copper (CuPd)		crochip Technology mical substance, if	, to the best of ntration of the o	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concer d-wide.	omply with EU Directive 2 via internal design contro nemical substance is NOT ocument, there is no cred y regulatory scheme work ammability standard for p	nctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the chroporated's knowledge and belief as of the date of this di, is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 fl
(pins) - Matter In / annealed at 150°C for 1	Doped Silicon 7440-21-3 100 Total 100.00 Total 100.00 Total 100.00 Total 100.00 Total 100.00 Total Wire Bond palladium coated % of Total Weight Copper (CuPd) Copper 7440-50-8 98 Prince Provand	f 0.55	crochip Technology mical substance, if oort at	, to the best of ntration of the o	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, tible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to	omply with EU Directive 2 via internal design contro nemical substance is NOT ocument, there is no cred y regulatory scheme work ammability standard for p ls/plastics/	nctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the chroporated's knowledge and belief as of the date of this di, is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 fl://lul.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship
inour I	Doped Silicon 7440-21-3 100 Total 100.00	and s in e	crochip Technology mical substance, if ort at p on the outer box a niconductor devices unnot guarantee the rial suppliers. Supp uppliers. Informatio	, to the best of ntration of the o o obtain a test old the packing ncorporated's s gy Incorporate vided by raw m and raw materia	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, ible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to hosubstances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets proving the provided by subcontract assemblers a ht of anticipated significant toxic metals components. The	omply with EU Directive 2 via internal design contro nemical substance is NOT ocument, there is no cred y regulatory scheme work ammability standard for p ls/plastics/ ped are made from polyvi n in this form concerning st of its knowledge and be nas been compiled based ets and some information arts and the average weig	nctive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the chorporated's knowledge and belief as of the date of this did is not below the threshold of regulatory concern for an diding compounds used by Microchip meet the UL94 Voffict/lul.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship ain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information or original packing materials is true and correct to the be upleteness and accuracy of data in this form because it mation is often protected from disclosure as trade secrided only as estimates of the average weight of these p
crochip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or nerwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or this Certificate of Compliance for semiconductor products.	Doped Silicon 7440-21-3 100 Total 100.00 Total 100.00 Total 100.00 Mire Bond palladium coated copper (CuPd) % of Total Weight copper (CuPd) Copper 7440-50-8 98 Palladium 7440-05-3 2 Total 100.00 devices in the the is. Supplier formation is cace levels Plating on external leads (pins) - Matte Tin / % of Total Weight (Crochin's 1440 - 1	and s in plier on is	crochip Technology mical substance, if ort at p on the outer box a niconductor devices unnot guarantee the rial suppliers. Supp uppliers. Informatio ot include trace leve	, to the best of ntration of the of o obtain a test old the packing incorporated's sylincorporated vided by raw mand raw materialse estimates dition. The exclusion	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, bible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastics. You can access the UL iQTM family of databases to a lastic, a so the data listed in this form. Microchip Technology In the ranges provided in Material Safety Data Sheets provided by subcontract assemblers a thit of anticipated significant toxic metals components. The IC) in the finished parts. d, with respect to the information provided in this declaration.	omply with EU Directive 2 via internal design contro nemical substance is NOT ocument, there is no cred y regulatory scheme work ammability standard for p Is/plastics/ ped are made from polyvi n in this form concerning st of its knowledge and be as been compiled based ets and some information arts and the average weig in silicon devices (silicon arranty, express or implie	incitive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the chorporated's knowledge and belief as of the date of this diplication is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 Volf (chulocom/global/eng/pages/offerings/industries/chemical protective "tubes" in which the specific product is ship ain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information or original packing materials is true and correct to the beupleteness and accuracy of data in this form because it materials in the form because it in the form protected from disclosure as trade secretided only as estimates of the average weight of these popants, metals, and non-metal materials contained within cochip Technology Incorporated does not provide any weranties provided by Microchip Technology Incorporated
Total	Doped Silicon 7440-21-3 100 Total 100.00 Total 100.00 Total 100.00 Total 100.00 Mire Bond palladium coated copper (CuPd) % of Total Weight copper (CuPd) Copper 7440-50-8 98 Palladium 7440-05-3 2 Total 100.00 devices in thee the is. Supplier formation is cace levels Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour Notal 100.00	and s in e plier on is els b's 3.42	crochip Technology mical substance, if for at p on the outer box a miconductor devices unnot guarantee the rial suppliers. Supp uppliers. Informatio ot include trace levels, limited product ovided in Microchip onsequential or	to the best of ontration of the of o obtain a test old the packing necorporated's say Incorporated by raw mand raw materiase estimates dision. The exclusion. The exclusion are to or indirect or indirect or indirect.	2002/95/EC (RoHS Directive), EU Directive 2011/65/EU (RoH Is, supplier declarations, and /or analytical test data. an intentional ingredient in the semiconductor device and, lible reason to believe that the unavoidable impurity concerd-wide. lastics. You can access the UL iQTM family of databases to myl chloride (PVC) plastic. "Window envelopes" used to hosubstances restricted by RoHS in Microchip Technology In elief, as of the date listed in this form. Microchip Technolog on the ranges provided in Material Safety Data Sheets proving not have been provided by subcontract assemblers a third anticipated significant toxic metals components. The IC) in the finished parts. d, with respect to the information provided in this declarationtained in Microchip's standard terms and conditions of subclarations and shall not be liable for any damages, dinto the part of the provided of the provided of the provided on the pro	omply with EU Directive 2 via internal design contro via internal design via internal desig	incitive 2002/53/EC (End-of-Life Vehicles (ELV) Directive). Inpliance with the above EU Directives has been verified chemical substance is absent from the list above, the chryporated's knowledge and belief as of the date of this did, is not below the threshold of regulatory concern for an ding compounds used by Microchip meet the UL94 V0 fit://ul.com/global/eng/pages/offerings/industries/chemica protective "tubes" in which the specific product is ship ain "reels" may be made from PVC plastic. Tochip Technology Incorporated believes the information or original packing materials is true and correct to the behalten and accuracy of data in this form because it is remained only as estimates of the average weight of these propants, metals, and non-metal materials contained within cochip Technology Incorporated does not provide any wranties provided by Microchip Technology Incorporated attions, sales order acknowledgement, and invoices contained and invoices.

PT 44 TQFP 10:02 AM : 8/29/2013