

Supplier Name: Texas Instruments Inc. (DUNS# 00-732-1904)  
 Contact Info: [ti.com/support](http://ti.com/support)  
 Form/Declaration Type: Distribute - RoHS and IEC 62474 DB  
 Created on: 06/04/2022

Details for "OPA228UA"

**Current Product Information**

TI part number	Lead finish/Ball material	MSL rating/peak reflow	Assembly site	Package   Pins	Package body size (mm)	Total device mass (mg)*
OPA228UA		Level-3-260C-168 HR	TI MALAYSIA A/T	D   8	3.91x4.9x1.58	84.7

\*Total Device Mass  
 The summary mass is a rounded value and will be within approximately +/- 10% of the detailed mass value.

**Environmental Ratings Information**

RoHS	REACH	Green	IEC 62474 DB
Yes	Yes	Yes	Yes

**Component Information**

Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Component Level	
				Percentage %	ppm	Percentage %	ppm
<b>Bond Wire</b>							
Precious Metals	Gold	7440-57-5	0.128313	99.376539	993765	0.151514	1515
Precious Metals	Palladium	7440-05-3	0.000804	0.622686	6227	0.000949	9
Precious Metals	Silver	7440-22-4	0.000001	0.000774	8	0.000001	0
Sub-Total			0.129118	100	1000000	0.152465	1525
<b>Die Attach Adhesive</b>							
Other Inorganic Materials	Silica	7631-86-9	0.015617	2.000031	20000	0.018441	184
Precious Metals	Silver	7440-22-4	0.538778	68.999972	690000	0.636199	6362
Thermoplastics	Epoxy	85954-11-6	0.226443	28.999997	290000	0.267388	2674
Sub-Total			0.780838	100	1000000	0.922028	9220
<b>Lead Frame</b>							
Copper and Its Alloys	Copper	7440-50-8	24.25509	97.41	974100	28.640846	286408
Copper and Its Alloys	Iron	7439-89-6	0.5976	2.4	24000	0.705657	7057
Copper and Its Alloys	Phosphorus	7723-14-0	0.00747	0.03	300	0.008821	88
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.00747	0.03	300	0.008821	88
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.00747	0.03	300	0.008821	88
Zinc and Its Alloys	Zinc	7440-66-6	0.0249	0.1	1000	0.029402	294
Sub-Total			24.9	100	1000000	29.402367	294024
<b>Lead Frame Plating</b>							
Nickel and Its Alloys	Nickel	7440-02-0	0.355273	95.119946	951199	0.419513	4195
Precious Metals	Gold	7440-57-5	0.002913	0.77992	7799	0.00344	34
Precious Metals	Palladium	7440-05-3	0.015314	4.100134	41001	0.018083	181
Sub-Total			0.3735	100	1000000	0.441036	4410
<b>Mold Compound</b>							
Other Inorganic Materials	Fused Silica	60676-86-0	48.115309	86.000001	860000	56.815422	568154
Other Plastics and Rubber	Carbon Black	1333-86-4	0.167844	0.3	3000	0.198193	1982
Other Plastics and Rubber	Organic Phosphorus	1330-78-5	0.307714	0.55	5500	0.363354	3634
Thermoplastics	Epoxy	85954-11-6	7.357166	13.149999	131500	8.687474	86875
Sub-Total			55.948033	100	1000000	66.064443	660644
<b>Semiconductor Device</b>							
Ceramics / Glass	Doped Silicon	7440-21-3	2.555569	100	1000000	3.017662	30177
Sub-Total			2.555569	100	1000000	3.017662	30177
<b>Total</b>			84.687058			100	1000000

**Important Note**  
 The ppm calculations are at the homogeneous material level and are maximum concentration values. The ppm displayed represents the homogeneous material with the highest ppm for that substance. The amount (mg) calculations represent the maximum total amount of each substance within the component.  
 The ppm calculations are at the component level and are average concentration values. The amount (mg) calculations represent the average total amount of each substance within the component.  
[See Glossary of Terms for more details.](#)

**Important Part Information**

There is a remote possibility the Customer Part Number (CPN) your company uses could reference more than one TI part number. This is due to two or more users (EMSI's or subcontractors) using the same CPN for different TI part numbers. If this occurs, please check your Customer Part Number and cross reference it with the TI part number seen on this page.

**Product Content Methodology**

[For an explanation of the methods used to determine material weights, See Product Content Methodology](#)

**Material Declaration Certificate for Semiconductor IC Packaged Products**

TI certifies that the material content information provided by TI is representative and accurate to the best of their knowledge based on material information provided by its suppliers and their combination into finished IC packaged products. TI semiconductor products designated to be "Pb-free", "Green" or "RoHS Exempt" fully meets the latest EU RoHS Directive requirements along with other legislation as seen in the former JIG-101 list that has been transferred to the IEC 62474 database.

**Important Information/Disclaimer**

TI bases its material content information on information provided by third-party suppliers and has taken, and continues to take, reasonably diligent steps to provide any required or available information. TI may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers may consider certain information to be proprietary, and thus certain information may not be available for release by TI. The material content information is provided by TI "as is."

[For additional information, please contact TI customer support.](#)

[Signature: \(click here for a fuller statement with a signed certificate\)](#)

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 For further environmental statements, please go to [www.ti.com/ecoinfo](http://www.ti.com/ecoinfo)  
 Created on: 06/04/2022

**RoHS:** Means TI semiconductor products that are compliant with the current RoHS requirement that the maximum concentration values of the ten substances listed in RoHS Annex II do not exceed 0.1 % by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI semiconductor products labeled as "RoHS Compliant" are suitable for use in specified lead-free processes. TI may also reference these types of semiconductor products as "Pb-Free." These TI semiconductor products are also fully compliant with GADSL and the IEC 62474 database for electronic requirements.

**RoHS Exempt:** Means TI semiconductor products that contain lead (Pb) above the RoHS Annex II threshold, but that fall within one of the specific RoHS exemptions noted above or documented in <http://www.ti.com/lit/pdf/szzq088>

**Green:** Means the content of Chlorine (Cl) and Bromine (Br)-based flame retardants meet JS709B low halogen requirements of <=1 000ppm threshold; Antimony trioxide (Sb2O3) contained in halogen based flame retardant materials meets the <=1 000ppm threshold requirement; and Beryllium Oxide (BeO) is <=1000ppm.