



Product / Process Change Notification SPOL-7GM2L2

Notice Date: 10/27/2008

Product Category: dsPIC; Ethernet Communication; Serial Communication;
PIC16xxx; PIC18xxx; PIC24xxx

Notification Subject: CCB#811: QUALIFICATION OF 28L QFN PACKAGE
(6X6X0.9MM) AT ATP ASSEMBLY

Notification Body:

PCN Status:
Final Notification

Microchip Part#s Affected (please see the link for these files at the end of this PCN):
[CCB 811_Microchip Catalog Part#s Affected.xls](#)
[CCB 811_Microchip Catalog Part#s Affected.pdf](#)

Description of Change:
New assembly site

Impacts to Data Sheet:
None

Reason for Change:
To improve production cycle time and on-time delivery performance for products in the 28L QFN package (6X6X0.9MM).

Change Implementation Status:
In progress

Estimated Change Implementation Date(s):
November 24, 2008 (Date Code: 0848)

NOTE: Please be advised that the utilization of this assembly site (ATP) for the 28L QFN package will depend on the backlog demand for products in this package.

Markings to Distinguish Revised From Unrevised Devices: (e.g.: Date Code, Device Marking, Ship Container Marking)
Traceability code

Attachment(s):

PCN_SPOL-7GM2L2_28L QFN_ANAP_CCB#811_Qual Report.pdf

CCB 811_Microchip Catalog Part#s Affected.pdf CCB 811_Microchip Catalog Part#s Affected.xls

Microchip Catalog Part#s Affected

DSPIC30F1010-20E/MM
DSPIC30F1010-30I/MM
DSPIC30F1010T-20E/MM
DSPIC30F1010T-30I/MM
DSPIC30F2010-20E/MM
DSPIC30F2010-20I/MM
DSPIC30F2010-30I/MM
DSPIC30F2010-30V/MMA31
DSPIC30F2010T-20E/MM
DSPIC30F2010T-20E/MM021
DSPIC30F2010T-20E/MMG
DSPIC30F2010T-20E/MMG020
DSPIC30F2010T-20I/MM
DSPIC30F2010T-30I/MM
DSPIC30F2010T-30I/MMG
DSPIC30F2010T-30V/MMA31
DSPIC30F2011-20E/ML
DSPIC30F2011-20I/ML
DSPIC30F2011-30I/ML
DSPIC30F2011T-20E/ML
DSPIC30F2011T-20I/ML
DSPIC30F2011T-30I/ML
DSPIC30F2012-20E/ML
DSPIC30F2012-20I/ML
DSPIC30F2012-30I/ML
DSPIC30F2012T-20E/ML
DSPIC30F2012T-20I/ML
DSPIC30F2012T-30I/ML
DSPIC30F2020-20E/MM
DSPIC30F2020-30I/MM
DSPIC30F2020-30I/MMB32
DSPIC30F2020T-20E/MM
DSPIC30F2020T-30I/MM
DSPIC30F2020T-30I/MMB32
DSPIC33FJ128GP202-I/MM
DSPIC33FJ128GP202T-I/MM
DSPIC33FJ128GP802-I/MM
DSPIC33FJ128GP802T-I/MM
DSPIC33FJ128MC202-I/MM
DSPIC33FJ128MC202T-I/MM
DSPIC33FJ128MC802-I/MM
DSPIC33FJ128MC802T-I/MM
DSPIC33FJ12GP202-E/ML
DSPIC33FJ12GP202-I/ML
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DSPIC33FJ32GP302T-I/MM
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DSPIC33FJ32MC202T-E/MM
DSPIC33FJ32MC202T-I/MM
DSPIC33FJ32MC302-I/MM
DSPIC33FJ32MC302T-I/MM
DSPIC33FJ64GP202-I/MM
DSPIC33FJ64GP202T-I/MM
DSPIC33FJ64GP802-I/MM
DSPIC33FJ64GP802T-I/MM
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DSPIC33FJ64MC202T-I/MM
DSPIC33FJ64MC802-I/MM
DSPIC33FJ64MC802T-I/MM
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ENC28J60/ML
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PIC16C63A-20I/ML
PIC16C63A-E/MLPKG
PIC16C63AT-04E/ML
PIC16C63AT-20E/ML
PIC16C63AT-20I/ML051
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PIC16F648AT-I/ML
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PIC16F72T-I/ML
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PIC16F737T-E/ML
PIC16F737T-I/ML
PIC16F73T-E/ML
PIC16F73T-I/ML
PIC16F76-E/ML
PIC16F76-I/ML
PIC16F767-E/ML
PIC16F767-I/ML
PIC16F767T-E/ML
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PIC16F76T-E/ML
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PIC16F913T-E/MLC02
PIC16F913T-I/ML
PIC16F916-E/ML
PIC16F916-E/MLC02
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PIC16F916T-E/MLC02
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PIC16LC72AT-04I/ML
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PIC18F25J10-I/ML020
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PIC24FJ32GA002-I/ML
PIC24FJ32GA002T-I/ML
PIC24FJ48GA002-I/ML
PIC24FJ48GA002T-I/ML
PIC24FJ64GA002-I/ML
PIC24FJ64GA002-I/MLC02
PIC24FJ64GA002T-I/ML
PIC24HJ128GP202-I/MM
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PIC24HJ128GP502-I/MM
PIC24HJ128GP502T-I/MM
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PIC24HJ12GP202T-E/ML
PIC24HJ12GP202T-I/ML
PIC24HJ32GP202-E/MM
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PIC24HJ64GP202T-I/MM
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PIC24HJ64GP502T-I/MM



MICROCHIP

QUALIFICATION REPORT
RELIABILITY LABORATORY

Q08088
CCB#811
PCN#: SPOL-7GM2L2

Date
September 11, 2008

28L QFN (6x6) New Package Qualification for ATP Assembly

(MSL Level 1 @ 260 °C)
(CCB#811)

Distribution

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MICROCHIP PACKAGE QUALIFICATION REPORT

Purpose	To qualify new package 28L QFN 6x6 at ATP
CN	BC080867
QUAL ID	Q08088
MP CODE	DECH14M4XV08
Part No.	PIC18F2520-E/MLV08
Bonding No.	BDE-000248R Rev. 01
<u>Package</u>	
Type	28L QFN
Package size	6 x 6 x 0.9 mm
Die thickness	11 mils
Die size	145.7 x 146.9 mils
<u>Lead Frame</u>	
Paddle size	169 x 169 mils
Material	ASM Singapore-C194
Surface	Ag spot plating
Process	Etched
Lead Lock	Half Etched
Part Number	101337326
<u>Die attach material</u>	
Epoxy	AMK-06
Wire	Au wire 1.0 mil-Tanaka Japan
Mold Compound	G700-Sumitomo Singapore
Plating Composition	Matte Tin



MICROCHIP PACKAGE QUALIFICATION REPORT

Assembly Yield

Lot No.	WF No.	Date Code
ANAP090400095	408350096.200	0817DHU
ANAP090400096	408350096.200	0817DHV
ANAP090400097	408350096.200	0817DJB

Result

Pass Fail _____

28L QFN (6x6) assembled by ATP pass reliability test per QCI-39000.
This package was qualified the Moisture/Reflow Sensitivity Classification Level 1 at 260 °C reflow temperature per IPC/JEDEC J-STD-020C standard.

Prepared By: Thinnapol N. **Date:** September 10, 2008 (Reliability Engineer)

Approved By: Surasit P. **Date:** September 10, 2008 (Reliability Manager)

PACKAGE QUALIFICATION REPORT

Qual Report : Q08088

Test Number (Reference)	Test Condition	Microchip Spec	Qty. (Acc.)	Date in	Date Out	Def/SS.	Result	Remarks
<u>MSL</u>								
MSL Level 1/260°C	85°C/ 85%RH Moisture Soak 168 hrs. System: TABAI ESPEC Model PR-3SPH 3x Convection-Reflow 260°C max System: HELLER (1808 EXL) (IPC/JEDEC J-STD-020C)	S12/14/16 (PDC)	135	07/01/08	07/10/08	0/135	Pass	
<u>Precondition</u>								
Electrical Test	Electrical Test :+25°C and 85°C System: J750	S12/14/16 (PDC)	693(0)	06/05/08	06/30/08	693		Good Devices
Bake	Bake 150°C, 24 hrs System: CHINEE	PI-92014B		07/01/08	07/02/08	693		
Moisture Soak	85°C/85%RH Moisture Soak 168 hrs. System: TABAI ESPEC Model PR-3SPH	PI-91173B		07/02/08	07/10/08	693		
Convection-Reflow	3x Convection-Reflow 260°C max System: HELLER (1808 EXL)	PI-91160B		07/10/08	07/10/08	693		
Electrical Test	Electrical Test :+25°C and 85°C System: J750	S12/14/16 (PDC)		07/10/08	07/11/08	0/693	Pass	

PACKAGE QUALIFICATION REPORT

Qual Report : Q08088

Test Number (Reference)	Test Condition	Microchip Spec	Qty. (Acc.)	Date in	Date Out	Def/SS.	Result	Remarks
Temp Cycle	Stress Condition: -65°C to +150 °C, 500 Cycles System : TABAI ESPEC TSA-70H Inspection: External crack inspection all units under 40X Optical magnification Electrical Test: +85 °C System: J750 Bond Strength: Bond Shear (14.0 grams) Wire Pull (> 3 grams)	PI-91020B		07/12/08	07/22/08	231		Parts had been pre-conditioned at 260 °C
		QCI-33003	30(0)	07/27/08	07/27/08	0/30		
		S12/14/16 (PDC)	231(0)	07/27/08	07/27/08	0/231	Pass	77 units / lot
		QCI-91022	15 (0)	07/27/08	07/28/08	0/15	Pass	(See attachment 1)
			15 (0)	07/27/08	07/28/08	0/15	Pass	Wire pull & bond shear after Temp Cycle
Pressure Cooker	Stress Condition: +121 °C, 100% RH, 15 PSI, 96 hrs. System: TABAI ESPEC TPC-421A Electrical Test: +25 °C System: J750	PI-92013B		07/12/08	07/16/08	231		Parts had been pre-conditioned at 260 °C
		S12/14/16 (PDC)	231(0)	07/16/08	07/24/08	0/231	Pass	77 units / lot

PACKAGE QUALIFICATION REPORT

Qual Report : Q08088

Test Number (Reference)	Test Condition	Microchip Spec	Qty. (Acc.)	Date in	Date Out	Def/SS.	Result	Remarks
HAST	Stress Condition: +130°C/85%RH, 96 hrs. System: HAST 6000X	PI-92010B		07/31/08	08/04/08	231		Parts had been pre-conditioned at 260°C
	Electrical Test: +25°C and 85°C System: J750	S12/14/16 (PDC)	231(0)	08/04/08	08/14/08	0/231	Pass	77 units / lot
Solderability	Steam Aging: Temp 93°C, 8Hrs System: SAS-3000 Solder Dipping: Solder Temp. 245°C System: ERSA RA 2200D Visual Inspection: External Visual Inspection	QCI-31003	22 (0)	07/13/08 07/14/08 07/14/08	07/14/08 07/14/08 07/14/08	22 22 0/22	Pass	
Physical Dimensions	Physical Dimension, 30 units from 1 lot	QCI-30017	30(0) Units	-	-	0/30	Pass	(See attachment 3) Physical Dimension
Bond Strength Data Assembly	Bond Shear (14.0 grams)	QCI-91022	30 (0) bonds Cpk>1.33	-	-	0/30 Cpk=4.83	Pass	(See attachment 2) Wire pull & bond shear data assembly
	Wire Pull (> 4 grams)		30 (0) wires Cpk>1.33	-	-	0/30 Cpk=4.18	Pass	

Cpk 1.33 is required for Q-100 qual only.

Attachment 1

Wire Pull & Ball Shear (Q08088) After T/C 500 Cyps.													
Sub group	Wire Pull Strength (Grams)						Sub group	Ball Shear Strength (Grams)					
	wire1	mode	wire2	mode	wire3	mode		Ball 1	mode	Ball 2	mode	Ball 3	mode
1	10.75	5	12.15	5	10.10	5	1	39.20	2	39.20	2	43.80	2
2	11.95	5	11.70	5	9.95	5	2	39.40	2	36.60	2	43.00	2
3	11.10	5	10.05	5	13.10	5	3	42.60	2	41.00	2	42.20	2
4	10.15	5	10.30	5	10.95	5	4	37.40	2	40.40	2	40.20	2
5	12.30	5	11.75	5	11.20	5	5	41.60	2	40.60	2	41.60	2
MIN.	9.95						MIN.	36.60					
MAX	13.10						MAX	43.80					
AVG.	11.17						AVG.	40.59					
STD.	0.97						STD.	2.01					
Cpk.	2.81						Cpk.	4.41					
SPEC	3.00						SPEC	14.00					

WIRE PULL FAILURE MODE CRITERIA

MODE 1 = LIFTED WELD <Reject>
 MODE 2 = LIFTED BALL <Reject>
 MODE 3 = BROKEN AT MID-SPAN
 MODE 4 = BROKEN AT WELD
 MODE 5 = BROKEN AT BALL-NECK
 MODE 6 = CRATERING <Reject>

BALL SHEAR FAILURE MODE CRITERIA

MODE 1 = BALL LIFT <Reject>
 MODE 2 = BALL SHEAR
 MODE 3 = BALL PAD LIFT
 MODE 4 = CRATERING <Reject>

Note : Average ball diameter = 2.57 Mils

Attachment 2

<u>Wire Pull & Ball Shear Strength 28L QFN (6x6) Data Assembly</u>													
REL #Q08088 CN#BC080867													
DECH14M4XV08 WF#408350096.200													
Sub group	Wire Pull Strength (Grams)						Sub group	Ball Shear Strength (Grams)					
	wire1	mode	wire2	mode	wire3	mode		Ball 1	mode	Ball 2	mode	Ball 3	mode
1	11.74	5	11.14	5	13.00	5	1	38.19	2	39.07	2	41.50	2
2	11.72	5	11.85	5	12.39	5	2	38.14	2	38.28	2	43.28	2
3	11.27	5	11.11	5	11.02	5	3	39.21	2	41.52	2	41.20	2
4	11.80	5	10.81	5	11.51	5	4	39.25	2	43.07	2	39.85	2
5	12.80	5	12.43	5	12.68	5	5	39.52	2	40.81	2	38.43	2
6	12.61	5	11.97	5	12.09	5	6	36.72	2	40.59	2	41.75	2
7	11.91	5	12.12	5	11.69	5	7	38.88	2	39.31	2	36.91	2
8	11.72	5	12.25	5	12.76	5	8	37.11	2	39.36	2	38.22	2
9	12.43	5	13.01	5	11.64	5	9	37.52	2	37.88	2	39.52	2
10	10.77	5	12.44	5	12.40	5	10	37.25	2	40.71	2	40.81	2
MIN.	10.77						MIN.	36.72					
MAX	13.01						MAX	43.28					
AVG.	11.97						AVG.	39.46					
STD.	0.64						STD.	1.76					
Cpk	4.18						Cpk	4.83					
SPEC	4.00						SPEC	14.00					

WIRE PULL FAILURE MODE CRITERIA

MODE 1 = LIFTED WELD <Reject>
 MODE 2 = LIFTED BALL <Reject>
 MODE 3 = BROKEN AT MID-SPAN
 MODE 4 = BROKEN AT WELD
 MODE 5 = BROKEN AT BALL-NECK
 MODE 6 = CRATERING <Reject>

BALL SHEAR FAILURE MODE CRITERIA

MODE 1 = BALL LIFT <Reject>
 MODE 2 = BALL SHEAR
 MODE 3 = BALL PAD LIFT
 MODE 4 = CRATERING <Reject>

Attachment 3

Physical Dimension of 28L QFN (6x6) ATP assembly (Q08088)										
ITEM	Overall Length	Package Width	Overall Height	Lead Width	Lead Pitch	Standoff	Exposed Pad Width	Exposed Pad Length	Contact Length	Contact to Exposed Pad
	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)	(MIL.)
Spec Min.	5.9	5.9	0.8	0.23	0.5	0	3.65	3.65	0.5	0.2
Spec Max.	6.1	6.1	1	0.35	0.8	0.05	4.2	4.2	0.7	
1	5.985	5.983	0.877	0.297	0.652	0.022	4.112	4.114	0.590	0.636
2	5.982	5.987	0.868	0.300	0.655	0.014	4.116	4.115	0.587	0.361
3	5.981	5.981	0.875	0.298	0.653	0.013	4.113	4.116	0.586	0.359
4	5.976	5.981	0.904	0.283	0.648	0.024	4.111	4.110	0.586	0.410
5	5.979	5.984	0.874	0.280	0.648	0.013	4.129	4.114	0.590	0.366
6	5.981	5.985	0.881	0.286	0.649	0.019	4.111	4.118	0.592	0.409
7	5.980	5.979	0.864	0.282	0.647	0.012	4.105	4.111	0.585	0.368
8	5.981	5.985	0.871	0.284	0.648	0.012	4.112	4.119	0.578	0.364
9	5.982	5.982	0.887	0.290	0.648	0.009	4.113	4.114	0.592	0.658
10	5.987	5.980	0.907	0.286	0.646	0.011	4.109	4.115	0.585	0.416
11	5.982	5.981	0.882	0.284	0.648	0.018	4.111	4.110	0.578	0.362
12	5.979	5.982	0.859	0.870	0.648	0.014	4.108	4.113	0.592	0.368
13	5.980	5.980	0.865	0.283	0.647	0.026	4.112	4.112	0.585	0.364
14	5.982	5.981	0.863	0.284	0.648	0.015	4.109	4.114	0.587	0.389
15	5.979	5.984	0.859	0.283	0.646	0.012	4.108	4.114	0.585	0.359
16	5.978	5.983	0.869	0.287	0.648	0.043	4.112	4.114	0.562	0.360
17	5.978	5.986	0.842	0.284	0.647	0.012	4.112	4.133	0.514	0.400
18	5.981	5.981	0.869	0.286	0.647	0.012	4.111	4.118	0.523	0.360
19	5.980	5.984	0.859	0.288	0.648	0.013	4.115	4.118	0.591	0.396
20	5.982	5.978	0.860	0.289	0.648	0.014	4.112	4.116	0.548	0.384
21	5.978	5.981	0.864	0.282	0.647	0.020	4.111	4.106	0.526	0.366
22	5.982	5.982	0.847	0.286	0.647	0.029	4.109	4.112	0.542	0.380
23	5.979	5.983	0.853	0.281	0.647	0.021	4.107	4.113	0.516	0.365
24	5.981	5.983	0.868	0.281	0.648	0.020	4.109	4.105	0.521	0.365
25	5.981	5.982	0.865	0.280	0.646	0.009	4.112	4.106	0.514	0.380
26	5.982	5.982	0.858	0.286	0.647	0.012	4.110	4.119	0.518	0.383
27	5.978	5.979	0.862	0.282	0.647	0.028	4.107	4.110	0.150	0.364
28	5.981	5.982	0.849	0.289	0.648	0.013	4.114	4.113	0.504	0.359
29	5.981	5.979	0.858	0.287	0.645	0.013	4.111	4.113	0.518	0.362
30	5.982	5.983	0.855	0.281	0.647	0.034	4.109	4.118	0.532	0.360
MIN	5.976	5.978	0.842	0.280	0.645	0.009	4.105	4.105	0.150	0.359
MAX	5.987	5.987	0.907	0.870	0.655	0.043	4.129	4.133	0.592	0.658
Average	5.981	5.982	0.867	0.305	0.648	0.018	4.111	4.114	0.546	0.392
STD	0.002	0.002	0.015	0.107	0.002	0.008	0.004	0.005	0.081	0.071

Attachment 4

Ball Diameter			
	Q08088-01	Q08088-02	Q08088-03
Item	ANAP090400095	ANAP090400096	ANAP090400097
	Mils	Mils	Mils
1	2.57	2.49	2.61
2	2.53	2.57	2.66
3	2.54	2.60	2.58
4	2.61	2.50	2.61
5	2.54	2.52	2.69
6	2.57	2.63	2.60
7	2.52	2.61	2.52
8	2.57	2.56	2.53
9	2.56	2.62	2.55
10	2.50	2.57	2.50
		MIN	2.49
		MAX	2.69
		Average	2.57
		STD	0.05