ON Semiconductor

FINAL PRODUCT/PROCESS CHANGE NOTIFICATION #16400

Generic Copy

Issue Date: 06-Oct-2010

TITLE: PQ2/PQFP 32x32 & 28x28 Transfer from Amkor Korea to Amkor Philippines

PROPOSED FIRST SHIP DATE: 06-Jan-2011 or after customer approval (whichever comes first.)

AFFECTED CHANGE CATEGORY(S): Automotive, Digital, Foundry, Industrial

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:
Contact your local ON Semiconductor Sales Office or Rhal Alolod<rhal.alolod@onsemi.com>

SAMPLES: Contact your local ON Semiconductor Sales Office

ADDITIONAL RELIABILITY DATA: Available
Contact your local ON Semiconductor Sales Office or Josephine Guevarra
<Phine.Guevarra@onsemi.com>

NOTIFICATION TYPE:

Final Product/Process Change Notification (FPCN)

Final change notification sent to customers. FPCNs are issued at least 90 days prior to implementation of the change.

ON Semiconductor will consider this change approved unless specific conditions of acceptance are provided in writing within 30 days of receipt of this notice. To do so, contact <quality@onsemi.com>.

DESCRIPTION AND PURPOSE:

Amkor Technology Korea Plant 1 (ATK 1) , ON Semi assembly subcontractor is removing the PQ2 / PQFP 32 x 32mm & 28 x 28mm package in their portfolio due low demands and production is not economically viable. These packages are running in very low volume and were not active for the past two years.
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Transfer PQ2/PQFP from ATK1 to ATP1. All equipment transferred to ATP1 since 31 July 2010.

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RELIABILITY DATA SUMMARY:

The assembly route qualification tests have been concluded with positive results. The qualification passes. The qualified route is PQFP_L_C03.

The PQFP Packages of Amkor Technology Philippines are qualified for dry pack level 3 according to the IPC/JEDEC spec J-STD-020 (Moisture Induced Stress Sensitivity for Plastic Surface Mount Devices). This means that the PQFP packages assembled in Amkor Technology Philippines can be stored in a floor life condition of maximum 30°C/60%RH for one week (cumulative maximum outside of a sealed dry bag or dry storage before soldering). Packages should be dried if exposed to a non-controlled environment for longer than one week prior to soldering. The packages can be dried using either storage at 50°C/10% humidity for 96 hours or storage at 125°C for 12 hours. After drying, the packages can be stored during another week at a floor life condition of maximum 30°C/60%RH or they need to be dried (using the above conditions) just before soldering.

The PCB solder simulation method used during this qualification was convection reflow soldering. The maximum soldering temperature during the simulation was 260°C. This qualification covers PQFP's with a pin count of up to 256 pins and a die area of up to 81.28 square mm.

RELIABILITY TEST RESULTS

Table 1: Moisture Sensitivity Tests:

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
ACOUSTIC MICROSCOPY INSPECTION	462	0	0	Passed
BAKE DRY, 24 HOURS at 125°C	462	NA	NA	NA
MOISTURE ABSORBTION, 30°C/60%RH for 192 HOURS	462	NA	NA	NA
CONVECTION REFLOW SOLDERING, 3x at 260°C	462	NA	NA	NA
CONVECTION REFLOW SOLDERING, 3x at 260°C	462	0	0	Passed
ACOUSTIC MICROSCOPY INSPECTION	462	0	0	All devices have been put either in thermo-mechanical tests (231 pcs) or in corrosion tests (231 pcs) afterwards.

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Table 2: Thermo-Humidity Tests

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
MOISTURE SENSITIVITY TEST	462	0	NA	NA
TEMPERATURE CYCLING, 100x at -55/125°C	231	NA	NA	NA
FUNCTIONAL TEST	231	0	0	Passed
ACOUSTIC MICROSCOPY INSPECTION	231	0	NA	NA
AUTOCLAVE TEST, 121°C/100%RH for 192 HOURS	231	NA	NA	NA
FUNCTIONAL TEST	231	0	0	Passed
ACOUSTIC MICROSCOPY INSPECTION	231	0	NA	NA
POST 192 HRS AUTOCLAVE BOND PULL TEST	5	0	0	Passed

Remark: - Bond pull test was done on 80 wires from 5 parts with 3.0 gram minimum reading as passing criterion. Actual readings were 12.78 gram for average, 17.3 gram for highest, 8.5 gram for lowest, 2.07 gram for Sigma.

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
THB (85°C/85%RH) Unbiased for 500 HOURS	45	NA	NA	NA
FUNCTIONAL TEST	45	0	0	Passed

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
HAST (130°C/85%RH) biased for 96 HOURS	45	NA	NA	NA
FUNCTIONAL TEST	45	0	0	Passed

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Table 3: Thermo-mechanical tests

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
MOISTURE SENSITIVITY TEST	462	0	NA	NA
TEMPERATURE CYCLING FOR 500x at -65/150°C	231	NA	NA	NA
FUNCTIONAL TEST	231	0	0	Passed
ACOUSTIC MICROSCOPY INSPECTION	231	0	NA	NA
POST 500x TEMP CYCLE BOND PULL TEST	5	0	0	Passed

Table 4: High Temperature Storage Test

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
FUNCTIONAL TEST	45	0	NA	NA
HIGH TEMPERATURE STORAGE @ 150°C FOR 500 HOURS	45	NA	NA	NA
FUNCTIONAL TEST	45	0	0	Passed
HIGH TEMPERATURE STORAGE @ 150°C FOR 1000 HOURS	45	NA	NA	NA
FUNCTIONAL TEST	45	0	0	Passed

Table 5: Internal Visual Inspection

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGEMENT
INTERNAL VISUAL	10	0	0	Passed
BOND WORKMANSHIP (X-RAY)	45	0	0	Passed
DIE ATTACH WORKMANSHIP (X-RAY)	45	0	0	Passed
SCANNING ACOUSTIC MICROSCOPY	45	0	0	Passed
BALL SHEAR TEST	1	0	0	Passed
BOND PULL STRENGTH	5	0	0	Passed

CHANGED PART IDENTIFICATION:
No change on ONSEMI Part number.

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List of affected Customer Specific Parts:

PARTS

06817-810-XTD
06825-806-XTD
08809-502-XTD
0ESTA-001-XTD
0ISEA-001-XTD
0MORP-001-XTD
0MXDC-001-XTD
0TMTB-001-XTD
11822-501-XTD
13648-501-XTD
13691-001-XTD
13845-501-XTD
13972-501-XTD
14064-501-XTD
14233-501-XTD
15019-517-XTD
15022-504-XTD
15022-515-XTD
15522-507-XTD
19281-001-XTD
19626-003-XTD
20685-001-XTD
20870-900-EPT
20707-002-XTD
61537-001-XTD
61793-001-XTD
62228-001-XTD
62271-001-XTD
62283-001-XTD
06817-536-XTD
06821-018-XTD
06825-516-XTD
06825-802-XTD
08697-001-XTD
08809-501-XTD
08988-502-XTD
11088-501-XTD
11617-501-XTD
12117-502-XTD
12117-503-XTD
20331-001-EPR
62124-001-XTD
62125-001-XTD
62126-001-XTD
20870-001-XTD