ON Semiconductor

FINAL PRODUCT/PROCESS CHANGE NOTIFICATION # 16405

Generic Copy

10-Feb-2010

TITLE: Changed from Matrix 270 mils to HDLF 250 mils pad size, PLCC 44L

PROPOSED FIRST SHIP DATE: 10-May-2010

AFFECTED CHANGE CATEGORY(S): Assembly Manufacturing

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:
Contact your local ON Semiconductor Sales Office or <Henry.Hernandez@onsemi.com>

SAMPLES: Contact your local ON Semiconductor Sales Office or <Isa.Calderon@onsemi.com>

ADDITIONAL RELIABILITY DATA: Available
Contact your local ON Semiconductor Sales Office or <Mark.Wasilewski@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:

- To Change the Lead frame matrix 270 mils pad size with sid#101305388 to HDLF 250 mils pad size with sid# 101312688 with the following reason as follows:
  - Matrix 270 mils pad size – no longer available
  - Increasing manufacturing efficiency and equipment utilization using high density lead frame

- No changes on lead frame material and package outline except for pad size from 270 mils to 250 mils. This pad size changed has no impact on assembly workmanship and within the assembly design rule.

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RELIABILITY DATA SUMMARY:

The assembly qualification tests have concluded with passing results. Qualification was run according to ON Semiconductor Global Specification 1000019, ON Semiconductor Assembly Reliability Qualification. ON Semiconductor releases the package and materials set under consideration for dry pack level 3 of IPC/JEDEC standard J-STD-020 (Moisture/Reflow Sensitivity Classification for Non-Hermetic Solid State Surface Mount Devices).

This qualification covers PLCC's with maximum die size area of 41.58 mm^2 and maximum pin count of 52 pins assembled at Amkor Technology Philippines.

TEST VEHICLE IDENTIFICATION

Device Identification	: 11804-002
Lot Identification	: B88473.1
Lot Assembly Tracecode	: 0942NAW
Die-attach Material	: 8361J EPOXY
Mold compound	: EME-G600
Die Coat Material	: Not applicable
Leadframe Material	: Copper
Lead Finish	: Matte Tin Plating
Lot Assembly House	: Amkor Technology Philippines, Plant 2
Package pin count	: 44L PLCC
Pad size	: 6.859 mm x 6.859 mm
Die Size	: 6.00 mm x 4.95 mm
Package marking	: LASER
Wire bond method	: Ball - Stitch
Wire bond material	: 1.2 Mil Gold

Reliability Test Results:

MOISTURE RESISTANCE TEST

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
ACOUSTIC MICROSCOPY INSPECTION	154	0	0	PASSED
BAKE DRY, 21 HOURS AT 125°C	154	Not applicable		
MOISTURE ABSORPTION, 30°C/60% RH FOR 192 HOURS	154	Not applicable		
REFLOW SOLDERING, 3X AT 260°C	154	Not applicable		
FUNCTIONAL TESTING	154	0	0	PASSED
ACOUSTIC MICROSCOPY INSPECTION	154	0		PASSED

Remarks:
No functional failures were observed after Moisture Resistance Test. Also, no delaminations were found upon acoustic microscopy inspection after the stress. Device passed Moisture Resistance Test.

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THERMO-HUMIDITY TEST

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
MOISTURE RESISTANCE TEST	154	0	0	PASSED
PRECONDITIONING TEMPERATURE CYCLING TEST, 100X AT -55°C/125°C	77	Not applicable		
FUNCTIONAL TEST	77	0	0	PASSED
ACOUSTIC MICROSCOPY INSPECTION	77	0	0	PASSED
UNBIASED-HAST, 130°C/85% RH FOR 96 HOURS	77	Not applicable		
FUNCTIONAL TEST	77	0	0	PASSED
ACOUSTIC MICROSCOPY INSPECTION	77	0	0	PASSED

Remarks:
No functional failures were observed after Thermo-humidity Test. Small amount of delaminations were found between the lead fingers and mold compound upon acoustic microscopy inspection after stress. Device passed Thermo-humidity Test.

THERMO-MECHANICAL TEST

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
MOISTURE RESISTANCE TEST	154	0	0	PASSED
TEMPERATURE CYCLING TEST, 500X AT -65°C/150°C	77	Not applicable		
FUNCTIONAL TEST	77	0	0	PASSED
ACOUSTIC MICROSCOPY INSPECTION	77	0		PASSED
BOND-PULL TEST[1]	5	0	0	PASSED

[1]Bond pull test was done on 100 wires from 5 parts with 2.5 grams minimum reading as passing criterion.

Remarks:
No functional failures were observed after Thermo-mechanical Test. Small amount of delaminations were found between the lead fingers and mold compound upon acoustic microscopy inspection after the stress. . Also, package passed post-TC Bond-Pull Test with Cpk = 1.52. Device passed Thermo-mechanical Test.

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HIGH TEMPERATURE STORAGE TEST

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
FUNCTIONAL TEST	77	0	0	PASSED
HIGH TEMPERATURE STORAGE TEST, 150°C FOR 500H	77	Not applicable		
FUNCTIONAL TEST	77	0	0	PASSED
HIGH TEMPERATURE STORAGE TEST, 150°C FOR 1000H	77			
FUNCTIONAL TEST	77	0	0	PASSED

Remarks:
No functional failures were observed after High Temperature Storage Test. Device passed HTS Test.

INTERNAL INSPECTION

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
X-RAY INSPECTION	15	0	0	PASSED
SCANNING ACOUSTIC MICROSCOPY	15	0	0	PASSED
INTERNAL VISUAL	10	0	0	PASSED
BOND PULL TEST[1]	5	0	0	PASSED
BOND SHEAR TEST[2]	5	0	0	PASSED

Remarks:
No workmanship problems were detected during the internal contact tests of the PLCC package. All test results are positive and passed the qualification requirements.

EXTERNAL INSPECTION

TEST SEQUENCE	SAMPLE SIZE	FAILURES OBSERVED	FAILURES ALLOWED	JUDGMENT
EXTERNAL VISUAL	ALL	0	0	PASSED
PHYSICAL DIMENSIONS INSPECTION	10	0	0	PASSED
SOLDERABILITY TEST	15	0	0	PASSED

Remarks:
No workmanship problems were detected during the external inspection of PLCC package.

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ELECTRICAL CHARACTERISTIC SUMMARY:
Not applicable

CHANGED PART IDENTIFICATION:
Not applicable

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List of affected General Parts:

11804-001-XTP
11804-002-XTP
20552-001-XTP
11060-001-XTD
11411-001-XTD
11411-002-XTD