ON Semiconductor

FINAL PRODUCT/PROCESS CHANGE NOTIFICATION #16663

Generic Copy

Issue Date: 26-Jun-2012

TITLE: Conversion to Matte Tin due to SnPb Plating Line EOL in Amkor Korea K1

PROPOSED FIRST SHIP DATE: 26-Sep-2012 or earlier upon customer approval

AFFECTED CHANGE CATEGORY(S): Assembly - Plating Material

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

SAMPLES: Contact your local ON Semiconductor Sales Office

ADDITIONAL RELIABILITY DATA: Available
Contact your local ON Semiconductor Sales Office or Phine 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:

The purpose of this notification is to announce that the external lead frame plating finish on identified leaded products in AMKOR Korea will convert from SnPb to Matte Tin lead finish. The demand for tin-lead (SnPb) plating from customers is decreasing and has resulted in low utility and inefficiency of the SnPb plating line.

The product's external leads are currently electroplated with 63/ 37% SnPb. Assembly supplier had convert 100% of their lead frame based packages to Pb-free plating material last December 31, 2011. To ensure supply continuity for customers, On Semiconductor is converting LQFP and TQFP products to the Matte Tin lead finish. In addition, the dieattach and mold compound material has been changed per below Table 1.

Table 1: Bill of Material

Package	BOM	Current	Proposed
LQFP/ TQFP	Epoxy	Ablestik 84-1 LMIS-4	Ablestik 3230
	Mold Compound	EME7320CR	Sumitomo G700L
	Lead Finish	SnPb	Matte Tin

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RELIABILITY DATA SUMMARY:

The assembly qualification tests have concluded with passing results. 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 LQFP's with maximum die size area of 45.72 mm2 and maximum pin count of 208 assembled at Amkor Technology Korea, Plant 1.

Test	Test Conditions	Result
Moisture Preconditioning (PC)	Moisture Soak (MSL = 3) Solder Reflow (3x @ 260°C)	0/462 (Figure 1&2)
Delamination check (SAT)	Acoustic Microscopy	0/231
HAST Unbiased (UHST)	130°C/ 85%RH for 96 hrs	0/231 (Figure 4)
Preconditioning Temperature Cycling (TC)	-55°C to 125°C for 100 cycles	0/231 (Figure 3)
Temperature Cycling (TC)	-65°C to 150°C for 500 cycles	0/231 (Figure 5)
Wire Bond Pull Strength (WBP)	Cond. C or D. Minimum pull strength after temperature cycle = 3 grams	0/5 (Figure 8)
High Temperature Storage (HTS)	150°C for 1000 hrs	0/77
X-ray	Not Applicable	0/45 (Figure 6)
Internal Visual	Not Applicable	0/10 (Figure 7)
External Visual	Not Applicable	0/ All sample size (Figure 10)
Wire Bond Shear (WBS)	Not Applicable	0/5 (Figure 9)
Solderability (SD)	Not Applicable	0/15
Physical Dimensions (PD)	Not Applicable	0/30

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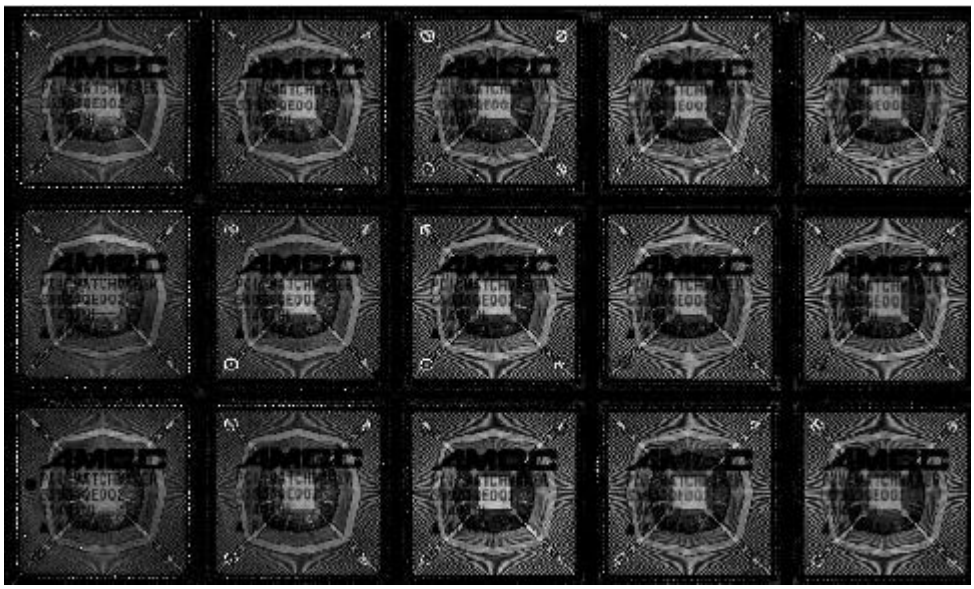

Figure 1. Acoustic Microscopy Image prior Moisture Resistance test.

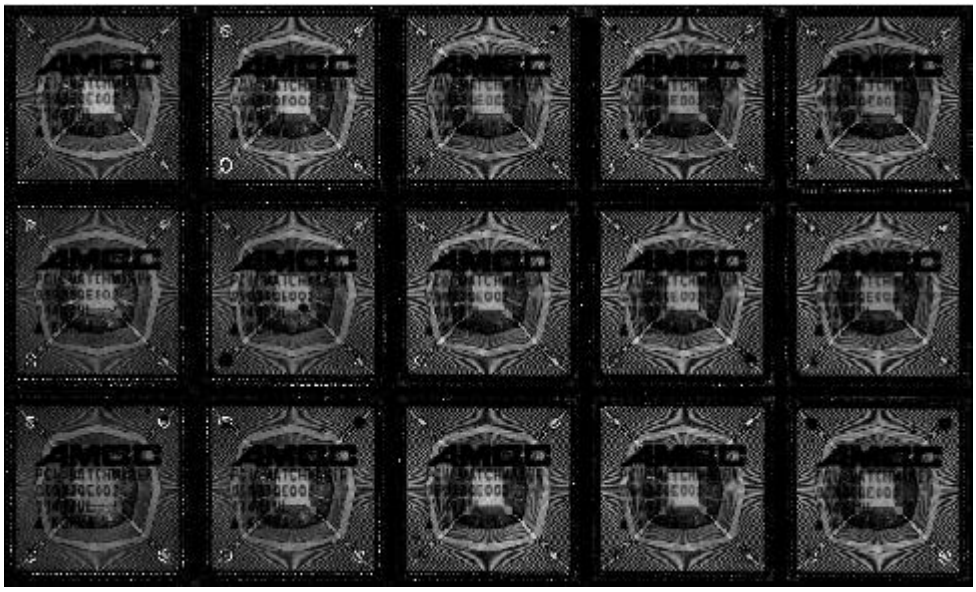

Figure 2. Acoustic Microscopy Image after Moisture Resistance test.

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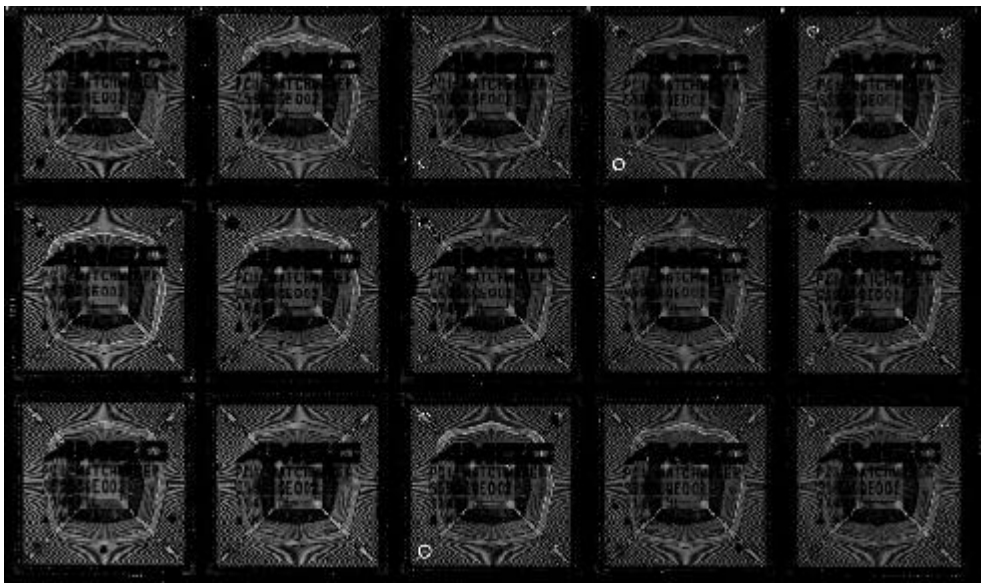

Figure 3. Acoustic Microscopy Image after Preconditioning Temperature Cycling Test.

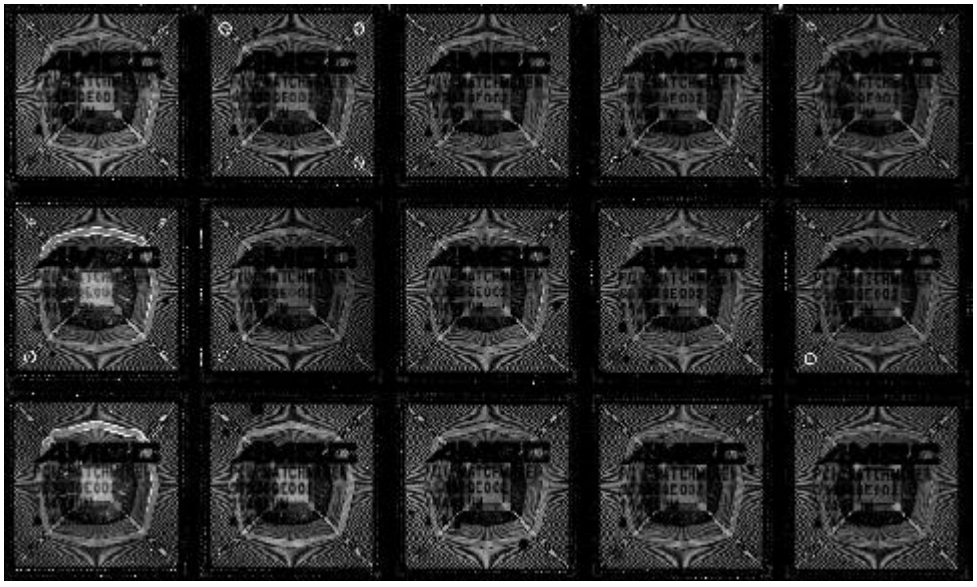

Figure 4. Acoustic Microscopy Image after Unbiased-HAST.

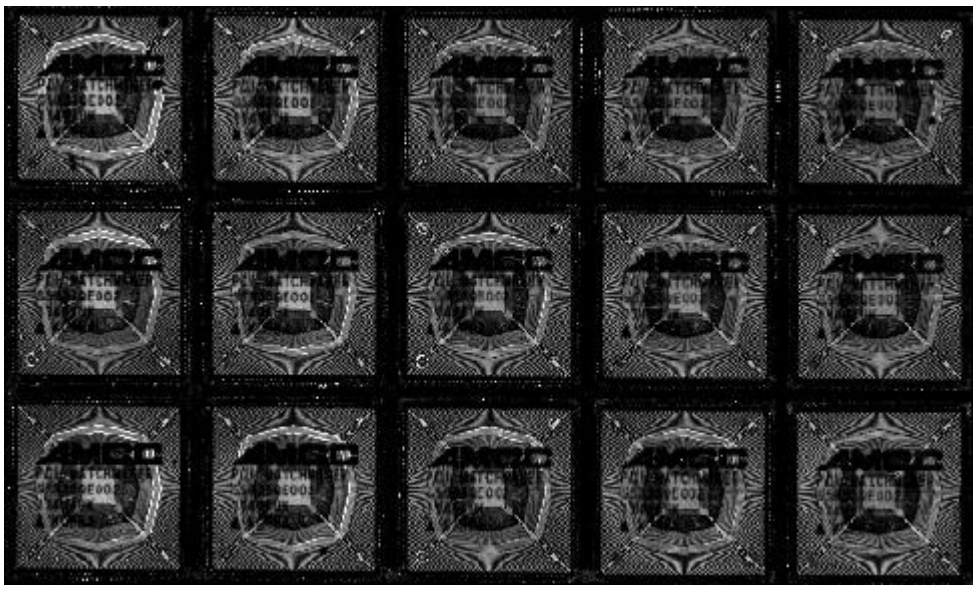

Figure 5. Acoustic Microscopy Image after Temperature Cycling Test.

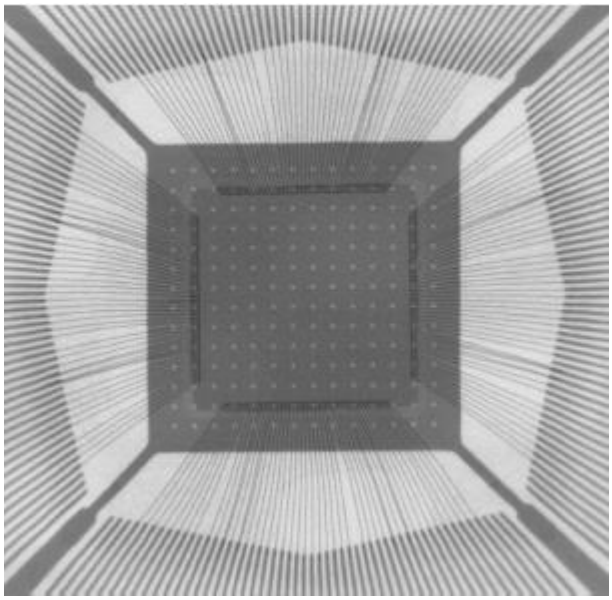

Figure 6. X-ray image of the LQFP package

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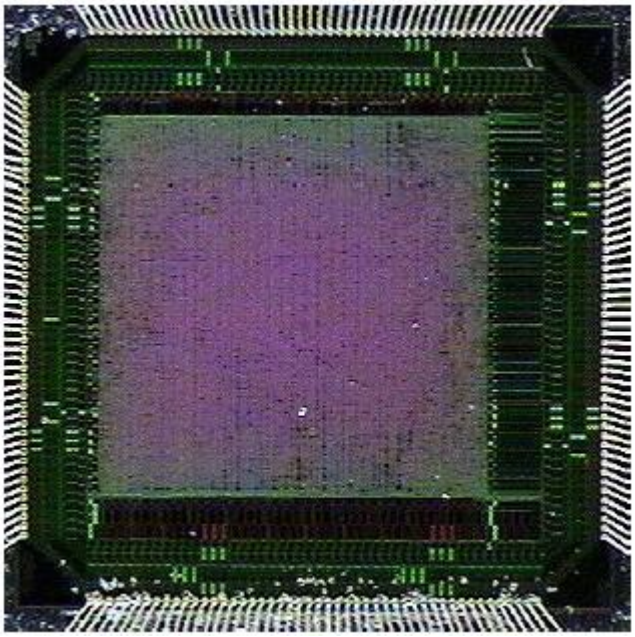

Figure 7. Die image of the LQFP package.

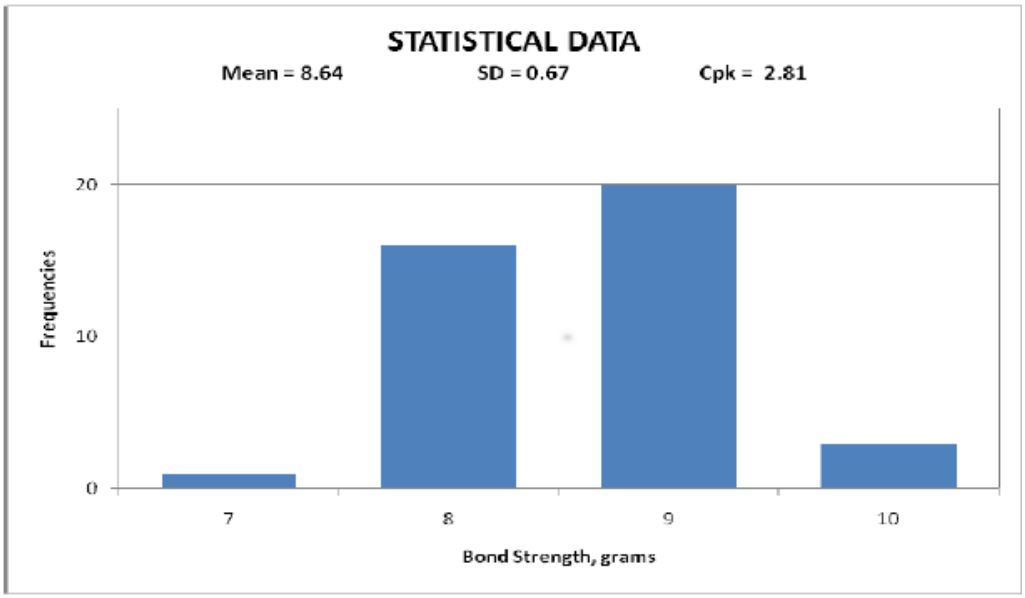

Figure 8. Histogram of Bond Pull Test Result.

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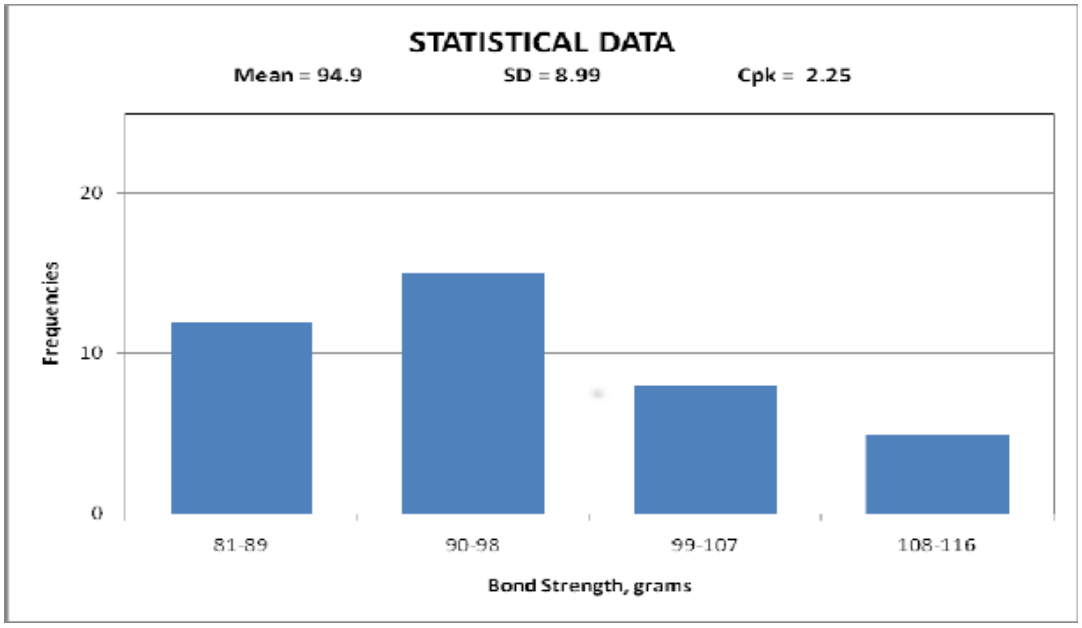

Figure 9. Histogram of Bond Shear Test Result.

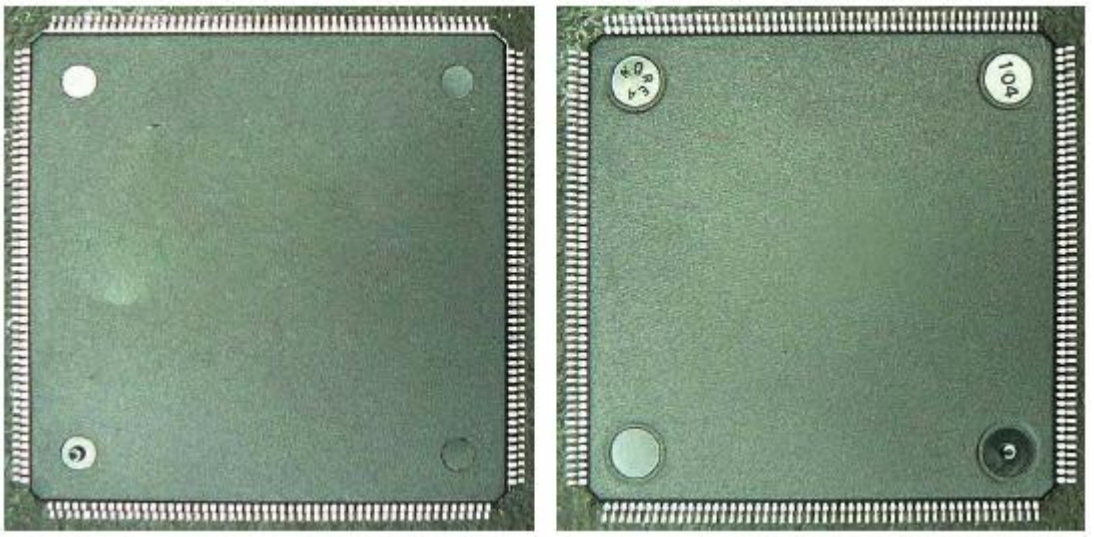

Figure 10. Top (left-side) and bottom (right-side) view of the LQFP package.

CHANGED PART IDENTIFICATION:

Products assembled can be identified with lead free compliancy marking (e3).

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List of affected Customer Specific Parts:

11086-802-XTD
19265-001-XTP
20459-001-XTD
20459-001-XTP
20459-012-XTD