



Product Change Notices

PCN No.: 20120302

Date: April 6, 2012

Subject: Apply Cu bonding wire on all of the AME's products

This is to inform you that Cu bonding wire will be applied to all the AME's products of those packages that stated in table 1 with below conditions :

1. AME to ensure " Electrical Characteristic" of Cu bonding wire package is 100% meet compliance of AME specifications.
2. AME had qualified this new material package with reliability test.
3. The Part Number of each product is unchanged, but identification by using D/C is available.

Table 1

SOT-23 、 SOT-25 、 SOT-26 、 SOT-23A 、 SOT-89 、 SOT-143 、 SOT-223
TSOT-23 、 TSOT-25 、 TSOT-26 、 TSOT-23A 、 TSOT-25A 、 TSOT-26A
SOP-8 、 SOP-8/PP 、 MSOP8 、 MSOP10
DFN-6 、 DFN-8 、 DFN-10 、 DFN-12 、 QFN-12 、 QFN-16 、 QFN-20
TO-92 、 TO-220 、 TO-252 、 TO-263
DIP-8 、 DIP-40 、 PDIP-8 、 PQFP44 、 SC-70

This notification is for your information and concurrence.

If you require AME Qual/Rel data or samples to qualify this change, please contact AME, Inc. directly or through AME's authorized Sales Representative or Distributor.

Please note this PCN will be effective 30 days after the issuing date automatically if we do not receive any response, comment or questions from you.

REL- Cu Wire -B



If you have any questions concerning this change, please contact:

PCN Originator:

Name: Bill Chou – Director, Engineering Department

Email: bill_chou@ame.com.tw

Phone: +886.2.2627.8687 # 2110

Reason of Change:

Add Cu bonding wire to ensure the sufficient material source from supplier.

Qual/Rel Report:

Test Item	Method	Description	Result
HTOL	MIL-STD-883F 1005.8	T _{STRESS} =125°C, Duration= 1000hrs Biased	Pass
ESD	MIL-STD-883G Method 3015.7	Human Body Model, Class 2, 2kV minimum	Pass
Latch-up	JEDEC STANDARD NO.78 MARCH 1997	Level A, 100mA minimum	Pass
MSL	IPC/JEDEC J-STD-020D	85/85 168 hours, IR-reflow 3 cycles Peak Temp.= 260°C	MSL1
HTS	JESD22-A103C	150°C, 1000 hrs	Pass
THT (85/85)	JESD22-A101C	85°C, 85% RH, 1000hrs, without bias	Pass
PCT	JESD22-A102C	121°C, 100% RH, 2atm, 168hrs	Pass
TCT	JESD22-A104D	-65°C ~ 150°C, 500 cycles, DWELL=15min	Pass
Solderability	J-STD-002C	Temp.=260°C, Duration=5sec	Pass
IR-reflow	JESD22-A113F	See IR reflow Profile, Perform 3 cycles test	Pass

REL- Cu Wire -B



AME Cu Wire Reliability Report

Packages related to this report were shown below :

SOT-23 、 SOT-25 、 SOT-26 、 SOT-23A 、 SOT-89 、 SOT-143 、 SOT-223

TSOT-23 、 TSOT-25 、 TSOT-26 、 TSOT-23A 、 TSOT-25A 、 TSOT-26A

SOP-8 、 SOP-8/PP 、 MSOP8 、 MSOP10

DFN-6 、 DFN-8 、 DFN-10 、 DFN-12 、 QFN-12 、 QFN-16 、 QFN-20

TO-92 、 TO-220 、 TO-252 、 TO-263

DIP-8 、 DIP-40 、 PDIP-8 、 PQFP44 、 SC-70

Prepared by Jess Lin, Supervisor of Quality & Reliability Dept.

Approved by Amy Shen, Manager of Production Management Dept.



Table of Contents:

I 、 Failures In Time Calculation

II 、 Product Reliability Test Result

III 、 Package Reliability Test Result

IV 、 IR-reflow Test Result



I 、 Failures In Time Calculation:

Use HTOL test information mentioned in sectionIV, FIT (Failures In Time) can be calculated as below:

$$FIT = (x^2_{(v, CL)} \times 10^9) / (2 \times S \times H \times A_F) = (4.61 \times 10^9) / (2 \times 77 \times 1000 \times 280.59)$$

=106.57 (pieces per 10⁹ hours) @ 40°C with 90% Confidence Level.

Where A_F is acceleration factor setting activation energy to 1.0eV as zero failure.

II 、 Product Reliability Test Result:

Test Item	Test Condition	Sample Size / Failures	Result
HTOL	T _{STRESS} =125°C Duration=1000hrs Biased, Read at 168/504/1000 hours	77 pcs / 0 pcs	Pass
ESD	Human Body Model Pin-to-Pin test Level 2, 2kV minimum	3 pcs per pin pair / 0 pcs	Pass
Latch-up	Level A, 100mA minimum	3 pcs per pin pair / 0 pcs	Pass



III 、 Package Reliability Test Result:

Test Item	Test Condition	Sample Size / Failures	Result
MSL	85/85 168 hours IR-reflow 3 cycles Peak Temp.= 260°C IPC/JEDEC J-STD-020C	22 pcs / 0 pcs	Level 1
HTS	Precondition ^{NOTE 1} Temp.=150°C Duration=1000 hours Unbiased, Read at 1000 hours	77 pcs / 0 pcs	Pass
THT	Precondition ^{NOTE 1} Temp.=85°C, R.H.=85% Duration=1000 hours Unbiased, Read at 1000 hours	77 pcs / 0 pcs	Pass
PCT	Precondition ^{NOTE 1} Temp.=121°C, R.H.=100% 15PSIG, Unbiased Duration=168 hours Read at 168 hours	77 pcs / 0 pcs	Pass
TCT	Precondition ^{NOTE 1} -65°C ~ 150°C 200 cycles Unbiased, Read at 500 cycles	77 pcs / 0 pcs	Pass
Solderability	Temp.=260°C (lead-free) Duration=5sec	5 pcs / 0 pcs	Pass

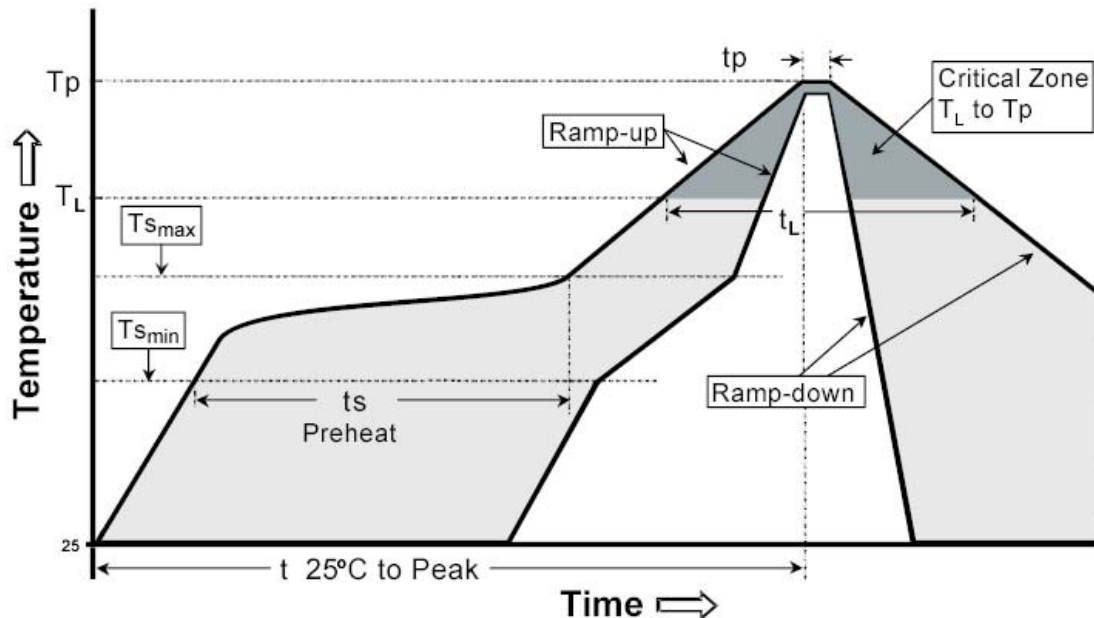
NOTE 1: 85/85 168 hours + IR-reflow 3 cycles with Peak Temp.= 260°C

IV、IR-reflow Test Result:

Test Item	Test Condition	Sample Size / Failures	Result
IR-reflow	See IR reflow Profile Perform 3 cycles test	22 pcs / 0 pcs	Pass

IR reflow Profile:

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate ($T_{s_{max}}$ to T_p)	3°C /second max.	3°C /second max.
Preheat		
- Temperature Min ($T_{s_{min}}$)	100°C	150°C
- Temperature Max ($T_{s_{max}}$)	150°C	200°C
- Time ($t_{s_{min}}$ to $t_{s_{max}}$)	60~120 seconds	60~180 seconds
Time maintained above		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60~150 seconds	60~150 seconds
Peak/Classification Temperature (T_p)	245°C	260°C
Time within 5°C of actual Peak Temperature (t_p)	10~30 seconds	20~40 seconds
Ramp-Down Rate	6°C /second max.	6°C /second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



REL- Cu Wire -B



AME, Inc. 安茂微電子股份有限公司

The product has successfully met AME's reliability standard that is required on all AME, Inc products.
Furthermore, QRA Dept. of AME, Inc monitors the reliability continuously to make sure that all product will still meet AME's reliability standard in the future.

REL- Cu Wire -B