



**Product Change Notices**

**PCN No.: 20120201**

**Date: March 9, 2012**

Subject: Apply Cu bonding wire on AME8815 TO-252 package

This is to inform you that Cu bonding wire will be applied on the AME8815 TO-252 series with below conditions:

1. AME to ensure "Electrical Characteristic" of Cu bonding wire package is 100% compliance AME8815 specifications.
2. AME qualified this new material package reliability.
3. The Part Number of each product is unchanged, but identification through D/C is available.

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 AME's authorized Sales Representative or Distributor.

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

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

**PCN Originator:**

Name: Bill Chou – Director, Engineering Department I

Email: [bill\\_chou@ame.com.tw](mailto:bill_chou@ame.com.tw)

Phone: +886.2.2627.8687 # 2110

Expected 1st Device Shipment Date: 3/1/2012

Effective Year/Work Week of Changed Product: NA



AME8815 TO-252 series Part Number – Au bonding wire

Part Number	Marking*	Output Voltage	Package
AME8815AECS150	AME8815 AECS150 yyww	1.50	TO-252-2
AME8815AECS150Z	AME8815 AECS150 yyww	1.50	TO-252-2
AME8815AECS180	AME8815 AECS180 yyww	1.80	TO-252-2
AME8815AECS180Z	AME8815 AECS180 yyww	1.80	TO-252-2
AME8815AECS190	AME8815 AECS190 yyww	1.90	TO-252-2
AME8815AECS190Z	AME8815 AECS190 yyww	1.90	TO-252-2
AME8815AECS250	AME8815 AECS250 yyww	2.50	TO-252-2
AME8815AECS250Z	AME8815 AECS250 yyww	2.50	TO-252-2
AME8815AECS330	AME8815 AECS330 yyww	3.30	TO-252-2
AME8815AECS330Z	AME8815 AECS330 yyww	3.30	TO-252-2
AME8815AECS475	AME8815 AECS475 yyww	4.75	TO-252-2
AME8815AECS475Z	AME8815 AECS475 yyww	4.75	TO-252-2
AME8815AECS500	AME8815 AECS500 yyww	5.00	TO-252-2
AME8815AECS500Z	AME8815 AECS500 yyww	5.00	TO-252-2



Part Number	Marking*	Output Voltage	Package
AME8815BECS150	AME8815 BECS150 yyww	1.50	TO-252-2
AME8815BECS150Z	AME8815 BECS150 yyww	1.50	TO-252-2
AME8815BECS180	AME8815 BECS180 yyww	1.80	TO-252-2
AME8815BECS180Z	AME8815 BECS180 yyww	1.80	TO-252-2
AME8815BECS190	AME8815 BECS190 yyww	1.90	TO-252-2
AME8815BECS190Z	AME8815 BECS190 yyww	1.90	TO-252-2
AME8815BECS250	AME8815 BECS250 yyww	2.50	TO-252-2
AME8815BECS250Z	AME8815 BECS250 yyww	2.50	TO-252-2
AME8815BECS330	AME8815 BECS330 yyww	3.30	TO-252-2
AME8815BECS330Z	AME8815 BECS330 yyww	3.30	TO-252-2
AME8815BECS475	AME8815 BECS475 yyww	4.75	TO-252-2
AME8815BECS475Z	AME8815 BECS475 yyww	4.75	TO-252-2
AME8815BECS500	AME8815 BECS500 yyww	5.00	TO-252-2
AME8815BECS500Z	AME8815 BECS500 yyww	5.00	TO-252-2



AME8815 TO-252 series Part Number – Cu bonding wire

Part Number	Marking*	Output Voltage	Package
AME8815AECS150	AME8815 AECS150 yyww	1.50	TO-252-2
AME8815AECS150Z	AME8815 AECS150 yyww	1.50	TO-252-2
AME8815AECS180	AME8815 AECS180 yyww	1.80	TO-252-2
AME8815AECS180Z	AME8815 AECS180 yyww	1.80	TO-252-2
AME8815AECS190	AME8815 AECS190 yyww	1.90	TO-252-2
AME8815AECS190Z	AME8815 AECS190 yyww	1.90	TO-252-2
AME8815AECS250	AME8815 AECS250 yyww	2.50	TO-252-2
AME8815AECS250Z	AME8815 AECS250 yyww	2.50	TO-252-2
AME8815AECS330	AME8815 AECS330 yyww	3.30	TO-252-2
AME8815AECS330Z	AME8815 AECS330 yyww	3.30	TO-252-2
AME8815AECS475	AME8815 AECS475 yyww	4.75	TO-252-2
AME8815AECS475Z	AME8815 AECS475 yyww	4.75	TO-252-2
AME8815AECS500	AME8815 AECS500 yyww	5.00	TO-252-2
AME8815AECS500Z	AME8815 AECS500 yyww	5.00	TO-252-2



Part Number	Marking*	Output Voltage	Package
AME8815BECS150	AME8815 BECS150 yyww	1.50	TO-252-2
AME8815BECS150Z	AME8815 BECS150 yyww	1.50	TO-252-2
AME8815BECS180	AME8815 BECS180 yyww	1.80	TO-252-2
AME8815BECS180Z	AME8815 BECS180 yyww	1.80	TO-252-2
AME8815BECS190	AME8815 BECS190 yyww	1.90	TO-252-2
AME8815BECS190Z	AME8815 BECS190 yyww	1.90	TO-252-2
AME8815BECS250	AME8815 BECS250 yyww	2.50	TO-252-2
AME8815BECS250Z	AME8815 BECS250 yyww	2.50	TO-252-2
AME8815BECS330	AME8815 BECS330 yyww	3.30	TO-252-2
AME8815BECS330Z	AME8815 BECS330 yyww	3.30	TO-252-2
AME8815BECS475	AME8815 BECS475 yyww	4.75	TO-252-2
AME8815BECS475Z	AME8815 BECS475 yyww	4.75	TO-252-2
AME8815BECS500	AME8815 BECS500 yyww	5.00	TO-252-2
AME8815BECS500Z	AME8815 BECS500 yyww	5.00	TO-252-2



**Reason of Change:**

Add Cu bonding wire to ensure the sufficient material source.

**Qual/Rel Report:**

Test Item	Method	Description	Result
HTOL	MIL-STD-883F 1005.8	T <sub>STRESS</sub> =125 , Duration= 1000hrs Biased	Pass
ESD	MIL-STD-883G Method 3015.7	Human Body Model, Class 2, 2kV minimum	Pass
	JEDEC EIA/JESD22-A115	Machine Model, Class B, 200V minimum	Pass
	JESD22-C101C	Charged Device Model, Class II, 200V minimum	Pass
Latch-up	JEDEC STANDARD NO.78 MARCH 1997	Level A, 100mA minimum	Pass
MSL	IPC/JEDEC J-STD-020C	85/85 168 hours, IR-reflow 3 cycles Peak Temp.= 260	MSL1
HTS	JESD22-A103D	150 , 1000 hrs	Pass
THT (85/85)	JESD22-A101C	85 ,85% RH, 1000hrs	Pass
PCT	JESD22-A102D	121 , 100% RH, 2atm, 168hrs	Pass
TCT	JESD22-A104D	-65 ~ 150 , 500 cycles, DWELL=15min	Pass
Solderability	J-STD-D02C	Temp.=260 , Duration=5sec	Pass
IR-reflow	JESD22-A113F	See IR reflow Profile, Perform 3 cycles test	Pass



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# Reliability Report for AME8815 Cu Wire Series Product

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

**Approved by Amy Shen, Manager of Production Management Dept.**

REL-AME8815-Cu-A



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## General Description:

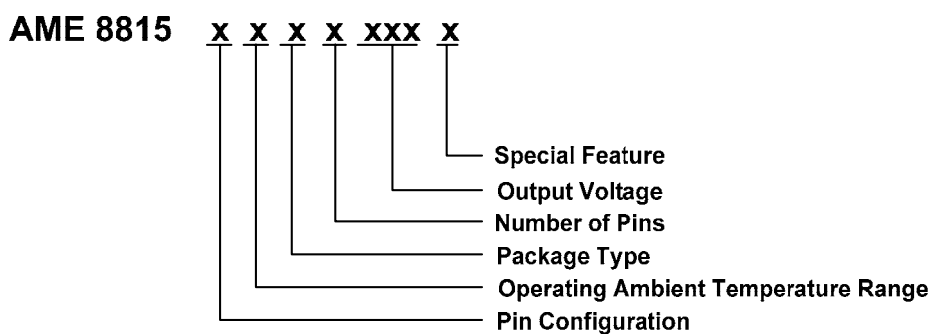
The AME8815 family of linear regulators feature low quiescent current (45mA typ.) with low dropout voltage, making them ideal for battery applications. It is available in TO-252 and TO-220 packages. The space-efficient SOT-223 and TO-263 packages are attractive for "Pocket" and "Hand Held" applications.

Output voltages are set at the factory and trimmed to 1.5% accuracy.

These rugged devices have both Thermal Shutdown, and Current Fold-back to prevent device failure under the "Worst" of operating conditions.

The AME8815 is stable with an output capacitance of 4.7  $\mu$ F or greater.

## Product Information:



Product Grade or Option		Operating Temperature Range	Package Type	Number of Pins	Output Voltage	Special Feature
A: 1. IN 2. GND 3. OUT	B: 1. GND 2. OUT 3. IN	E: -40°C to 85°C	C: TO-252	S: 2 T: 3	120: V=1.2V 150: V=1.5V 180: V=1.8V 190: V=1.9V 250: V=2.5V 310: V=3.1V 330: V=3.3V 390: V=3.9V 475: V=4.75V 500: V=5.0V	Z: Lead Free



### Failures In Time Calculation:

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

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

=106.69 (pieces per 10<sup>9</sup> hours) @ 40 with 90% Confidence Level.

Where A<sub>F</sub> is acceleration factor setting activation energy to 1.0eV as zero failure.

### Product Reliability Test Result:

Test Item	Test Condition	Sample Size / Failures	Result
HTOL	T <sub>STRESS</sub> =125 Duration=1000hrs Biased, Read at 168/504/1000 hours	77 pcs / 0 pcs	Pass
ESD	Human Body Model Pin-to-Pin test Class 2, 2kV minimum	3 pcs per pin pair / 0 pcs	Pass
	Machine Model Pin-to-Pin test Class B, 200V minimum	3 pcs per pin pair / 0 pcs	Pass
	Charged Device Model Class II, 200V minimum	3 pcs package pair / 0 pcs	Pass
Latch-up	Level A, 100mA minimum	3 pcs per pin pair / 0 pcs	Pass



## Package Reliability Test Result:

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

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

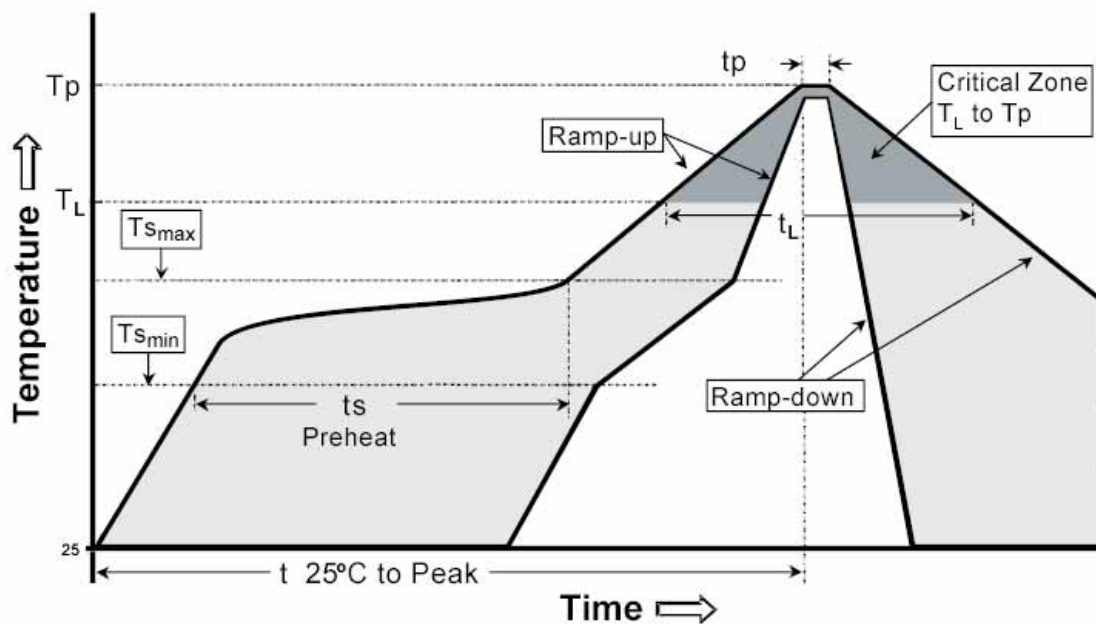


## IR-reflow Test Result:

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.
<b>Preheat</b>		
- 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
<b>Time maintained above</b>		
- 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.





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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-AME8815-Cu-A