



June 2, 2014  
PPCN #130018 withdrawn

## **PROCESS/ PRODUCT CHANGE NOTIFICATION**

This is to inform you that Micrel has withdrawn PPCN 130018 to qualify Cu wire bonding at ASE Kunshan, China. Although copper wire bonding was fully qualified at ASE Kunshan by Micrel, initial mass production runs did not meet our in-line quality requirements. Micrel now believes that certain process improvements are required which will necessitate a new PPCN at a future date. Those process improvements are undergoing qualification now and we are confident that we will release a robust copper wire solution at ASE Kunshan in the near future.

### **Original PPCN for reference**

## **PROCESS/ PRODUCT CHANGE NOTIFICATION**

This is to inform you that Micrel has qualified Cu wire bonding process for certain SOIC-8L products at ASE Kunshan, China. Micrel will produce and deliver listed Micrel part numbers at ASE Kunshan starting Dec 15, 2013.

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

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## **TYPE OF CHANGE**

We are converting certain SOIC-8L products from existing Au wires manufactured at Stars Microelectronics, Thailand to the Cu wires manufactured at ASE Kunshan, China. Except the wire bond and assembly material and assembly location, the package type, form, fit and function will not be affected. These products will be tested and drop shipped from our qualified subcontractors including ASE Kunshan with the same packing and shipment format.

## **EFFECTIVITY**

Please contact Micrel Sales representative, if needed, to order samples with Cu wire bonding process at ASE Kunshan.

After Dec 15, 2013, Micrel will begin to test and drop ship the listed devices with Cu wire bonding process. The products shipped could be either with Au wire or Cu wires until the entire inventory with Au wire been deleted.



After Dec 15, 2013, the listed products assembled at Stars with Au wire process could only be ordered under special part numbers. Customers who desire to only use Au wire will need to contact Micrel Sales representative to assign special part numbers.

### **PRODUCT ID (DESCRIPTION)**

We list all the part numbers that would be converted to Cu wire process and assembled, tested, and drop shipped from ASE Kunshan.

MIC2025-1YM  
MIC2025-1YM TR  
MIC2025-2YM  
MIC2025-2YM TR  
MIC2026-1YM  
MIC2026-1YM TR  
MIC2026-2YM  
MIC2026-2YM TR  
MIC2042-1YM  
MIC2042-1YM TR  
MIC2042-2YM  
MIC2042-2YM TR  
MIC2075-1YM  
MIC2075-1YM TR  
MIC2075-2YM  
MIC2075-2YM TR  
MIC2545A-1YM  
MIC2545A-1YM TR  
MIC2545A-2YM  
MIC2545A-2YM TR  
SPN011007Y  
SPN011007Y TR

### **DESCRIPTION OF CHANGE**

Micrel has qualified Cu wire bonding process for SOIC-8L at ASE Kunshan. All the listed part numbers produced at Stars will be converted from the existing Au wires to Cu wires after Dec 15, 2013 and assembled at ASE Kunshan, tested, and drop shipped from our qualified subcontractors including ASE Kunshan.

### **EFFECT OF CHANGE**

Except the wire bond material at assembly, lead finish, and certain assemble material (refer to summary table below), there is no change in data sheet and the form, fit, or function of the product. We increase the die metal thickness about 30% more to



accommodate the Cu ball bonding on the bond pads. The land pattern, lead layout, naming, and lead count are the same. There is no change in the die or testing. There is no change in moisture sensitivity rating.

Assemble BOM	LF base	Lead finish	Die attach	Bond wire	Mold Compound
Stars Au wire	Cu	NiPdAu	ABLEBOND 2200D	Au	Sumitomo G600
ASE Cu wire		Sn	Hitachi EN-4900	Cu	Hitachi CEL-9240

The parts made with the Cu wires will have an additional code “C” added to the end of date code. The marking on the units with the Cu wires will show “YYWW C”. The marking on the units with current Au wire will show “YYWW” only.

The parts made at Stars with Au bond wires will have a “TH” country of origin (COO) mark; and the parts made at ASE with Cu wires will have a “CN” country of origin mark.

### **QUALIFICATION**

ASE Kunshan is Micrel’s qualified subcontractor. The Cu process is already a high-volume mass-production process at ASE Kunshan and shipped to ASE’s other customers. Test system (tester and handler models), hardware, and Test programs used at ASE Kunshan are the same as those currently used at other Micrel subcontractors to ensure an “exact copy” of the test to ASE Kunshan. Traceability is maintained by date code and lot number for all products. We attach a representative reliability report for qualifying Micrel products assembled with Cu process at ASE Kunshan.



## RELIABILITY REPORT

DATE: 9/10/2013

QUALITY ENG :	PURPOSE: ASEK Copper Wire Bonding
H. GRIMM	Qualification of Cu Wire bonding for MICREL BCD2 Products.  ASE Cu Wire bonding process has passed Reliability testing and is released to production.

PART NUMBERS	PACKAGE TYPE	ASSEMBLY LOCATION	FAB LOCATION	PROCESS NAME
MIC2026-1YM	SOICN-8L	ASE, Kunshun, CHINA	FORTUNE DRIVE, SAN JOSE	BCD2
MIC2026-2YM	SOICN-8L	ASE, Kunshan, CHINA	FORTUNE DRIVE, SAN JOSE	BCD2

### DIE QUALIFICATION RESULTS

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	168 HR Rej/ss	1000 HR Rej/ss	2000 HR Rej/ss	COMMENTS
HTOL  High Temperature Operating Life Test  With Level 1 Pre-conditioning  Tpeak + 260°C 3X Reflow	JESD22, Method 108	1301	BA38061MQI	0/77	0/77	0/77	
	TA= + 125°C	1305	BA39230MQB	0/77	0/77	0/77	
	VCC = 5.5V	1306	BA39230MQD	0/77	0/77	0/77	

### PACKAGE QUALIFICATION RESULTS

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	COMMENTS	
HAST  With Level 1 Pre-conditioning  Tpeak + 260°C 3X Reflow	JESD22-A110	1301	BA38061MQI	0/65		
	Ta= +131°C/85%RH	1305	BA39230MQB	0/65		
		1306	BA39230MQD	0/77		
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	1000 cy Rej/ss	COMMENTS	
TEMP CYCLE  With Level 1 Pre-conditioning  Tpeak + 260°C 3X Reflow	JESD22-A104	1301	BA38061MQI	0/77		
	Ta = -65°C/+150°C	1305	BA39230MQB	0/77		
		1306	BA39230MQD	0/77		
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	1000 HR Rej/ss	2000 HR Rej/ss	COMMENTS



HTSL  <i>High Temperature Storage Life With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A103  Ta = +150°C	1301  1305  1306	BA38061MQI  BA39230MQB  BA39230MQD	0/76  0/76  0/76	0/76  0/76  0/76	
<b>TEST DESCRIPTION</b>	<b>METHOD/CONDITIONS</b>	<b>DATE CODE</b>	<b>LOT ID.</b>	<b>500 HR Rej/ss</b>	<b>1000 HR Rej/ss</b>	<b>COMMENTS</b>
BIAS HUMIDITY  <i>With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A101  Ta= +85°C/85%RH	1238	BA24646NMC	0/77	0/77	
<b>TEST DESCRIPTION</b>	<b>METHOD/CONDITIONS</b>	<b>ASSEM. LOT ID.</b>		<b>P / F</b>	<b>COMMENTS</b>	
CSAM INSPECTION	IPC/JEDEC JSTD-020	MIC2026-1-2 MCL305N005/007		84 / 0		
<b>TEST DESCRIPTION</b>	<b>METHOD/CONDITIONS</b>	<b>LOT ID.</b>		<b>P / F</b>	<b>COMMENTS</b>	
PHYSICAL DIMENSIONS	MIL STD 883	MIC2026-1-2 MCL305N005/007		1 / 0		
<b>TEST DESCRIPTION</b>	<b>METHOD/CONDITIONS</b>	<b>LOT ID.</b>		<b>P / F</b>	<b>COMMENTS</b>	
RADIOGRAPHIC X-RAY	MIL STD 883 TM2010	MIC2026-1-2 MCL305N005/007		5 / 0		
<b>TEST DESCRIPTION</b>	<b>METHOD/CONDITIONS</b>	<b>LOT ID.</b>		<b>P / F</b>	<b>COMMENTS</b>	
SOLDERABILITY	JESD22-B102	MIC2026-1-2 MCL305N005/007		5 / 0	MATTE TIN PLATING	
FLAMMABILITY	UL-94V-0  Certified	All mold compounds used by Micrel meet this standard. See the UL website on-line list of material flammability certifications. Micrel requires a Certificate of Compliance from the assembly house and we verify the certifications on the web.				