



April 17, 2015
PPCN #150003

PROCESS/ PRODUCT CHANGE NOTIFICATION

This is to inform you that Micrel has qualified Silver wire bonding process for certain SOIC-8L products at STARS, Thailand. Micrel will convert the listed Micrel part numbers from the existing Gold wire bonding to Silver wire bonding at STARS starting July 17, 2015.

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 Silver wires manufactured at the same site. Except the wire bond material, the package material, type, form, fit and function will not be affected. These products will be tested and drop shipped from our same qualified subcontractors including STARS with the same packing and shipment format.

EFFECTIVITY

Please contact Micrel Sales representative, if needed, to order samples with Silver wire bonding process at STARS.

After July 17, 2015, Micrel will begin to test and drop ship the listed devices with Silver wire bonding process. The products shipped could be either with Au wire or Silver wires until the entire inventory with Au wire been depleted.

After July 17, 2015, 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)

See the product list in the attached Excel file "Part list for PPCN 15003 Convert Au to Ag Bond Wire for SOIC-8L" for Micrel's products that would be converted to Silver wire process, assembled, tested, and drop shipped from STARS.

DESCRIPTION OF CHANGE



Micrel has qualified Silver wire bonding process for SOIC-8L at STARS using Tanaka Silver wire type SEC. Attached is a Tanaka brochure showing some of the properties of wire type SEC. All the listed part numbers produced at Stars will be converted from the existing Au wires to Silver wires after July 17, 2015 and assembled at STARS, tested, and drop shipped from our same qualified subcontractors including STARS.

EFFECT OF CHANGE

Except the wire bond material at assembly, there is no change in other assembly material, lead finish, data sheet and the form, fit, or function of the products. 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.

The parts made with the Silver wires will have an additional code "S" added to the end of date code. The marking on the units with the Silver wires will show "YYWWS". The marking on the units with current Au wire will show "YYWW" only.

Silver wire has shown superior high temperature storage results compared to gold.

QUALIFICATION

STARS is a Micrel's qualified subcontractor. The Silver process is already a mass-production process at STARS and shipped to STARS' other customers. Traceability is maintained by date code and lot number for all products. We attach a representative reliability report for qualifying Micrel products assembled with Silver process at STARS.



RELIABILITY REPORT

DATE: 2/19/2015

QUALITY ENG:		PURPOSE:					
H.Grimm		STARS, THAILAND ASSEMBLY using TANAKA SEC 2mil Ag-Alloy Wire (Qual Vehicle MIC2026)					
ASSEMBLY	PACKAGE TYPE :	MSL	M/C	DIE ATTACH	Qual Lot #	DATE CODE	FAB PROCESS
STARS ELECTRONICS, THAILAND	SOIC-8L RoHS, Bromine Free ASM PPF NiPdAu Plating	LEVEL 1	EME G600	2200D	BA38061MEL	1437	BCD2
					BA38061MEM	1438	BCD2
					BA38061MEN	1439	BCD2

QUALIFICATION RESULTS :

TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	168 HR Rej/pass	1000 HR Rej/pass	COMMENTS
HTOL <i>High Temperature Operating Life Test</i> With Level 1 Pre- conditioning	JESD-22, Method A108 TA= + 125°C, VCC = +5.5V	BA38061MEL	1437	0/77	0/77	
		BA38061MEM	1438	0/77	0/77	
		BA38061MEN	1439	0/77	0/77	
TEST DESCRIPTION	METHOD/CONDITIONS	LOT ID.	DATE CODE	Rej/ss	L1 PRE-CONDITIONING FLOW	
Level 1 Pre-conditioning Flow	JESD22-A113	BA38061MEL	1437	0/453	STEP1-> ELECTRICAL TEST STEP2-> EXTERNAL VISUAL BAKE 24H + 125C STEP3-> SOAK 168H +85c/85%rh STEP4-> 3X IR REFLOW +260c STEP5-> FLUX IMMERSION STEP6-> RINSE STEP7-> EXTERNAL VISUAL STEP8-> ELECTRICAL TEST	
		BA38061MEM	1438	0/450		
		BA38061MEN	1439	0/450		
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	168 HR Rej/pass	COMMENTS	
PRESSURE POT With Level 1 Pre- conditioning	JESD22-A102 Ta = +121°C/100%RH 15 PSIG	BA38061MEL	1437	0/45		
		BA38061MEM	1438	0/45		
		BA38061MEN	1439	0/45		
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	500 cyc Rej/pass	1000 cyc Rej/pass	COMMENTS



TEMP CYCLE With Level 1 Pre-conditioning	JESD22-A104	BA38061MEL	1437	0/45	0/45		
	Ta = -65°C/+150°C	BA38061MEM	1438	0/45	0/45		
		BA38061MEN	1439	0/45	0/45		
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	1000 HR Rej/pass		COMMENTS	
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103	BA38061MEL	1437	0/76			
	Ta = +150°C	BA38061MEM	1438	0/76			
		BA38061MEN	1439	0/76			
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	250 HR Rej/pass	500 HR Rej/pass	COMMENTS	
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103	BA38061MEL	1437	0/76	0/76	Information only accelerated test	
	Ta = +175°C	BA38061MEM	1438	0/76	0/76		
		BA38061MEN	1439	0/76	0/76		
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	100 HR Rej/pass	200 HR Rej/pass	411 HR Rej/pass	COMMENTS
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103	BA38061MEL	1437	0/76	0/76	0/76	Info only test
	Ta = +200°C	BA38061MEM	1438	0/76	0/76	0/76	
		BA38061MEN	1439	0/76	0/76	0/76	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	192 HR Rej/ss	COMMENTS	
HAST With Level 1 Pre-conditioning	JESD22-A110 (BIASED)	BA38061MEL	1437	0/45	0/45		
	Ta= +130°C/85%RH	BA38061MEM	1438	0/45	0/45		
		BA38061MEN	1439	0/45	0/45		
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	RESULT	COMMENTS		
SOLDER IRON	JESD22-B106B 5 seconds @+380°C	BA38061MEL	1437	0/5			
TEST DESCRIPTION	METHOD/CONDITIONS	LOT NUMBER	DATE CODE	STRESS	RESULT rej/ss	COMMENTS	
ESD-HBM	TA = +25°C R = 1500 Ohms, C = 100 pF 1X +/- Voltage	BA38061MEM	1438	+/-500V +/-1000V +/-1500V +/-2000V	0/6 0/6 0/6 0/6	3 samples from each lot per voltage level. Device passes 2kV HBM	
		BA38061MEN	1439				



TEST DESCRIPTION	METHOD/CONDITIONS	LOT NUMBER	DATE CODE	STRESS	RESULT rej/ss	COMMENTS
LATCH-UP	JESD-78, TA = +25°C I/O TRIGGER @+/- 200mA, O/V TEST @ ABS MAX VCC OR 1.5X VCC	BA38061MEL	1437	I/O LU O/V LU	0/6 0/6	
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.				

Conclusion: STARS Ag Wire bonding passed the Reliability Tests required for production release.