



April 7, 2015
PPCN #140009

PROCESS/ PRODUCT CHANGE NOTIFICATION

This is to inform you that, Micrel has qualified TSMC in Taiwan as an alternative wafer fabrication site for our MICRF112 and MICRF113 products in addition to the current ASM Fab in Australia.

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

NAME: Ira Hilf
EMAIL: ira.hilf@micrel.com
PHONE: 408-474-1237

TYPE OF CHANGE

We are adding TSMC as a wafer fabrication site in addition to the current ASM Fab site. The die design, test, package type, material, form, fit and function will not be affected. These products will be shipped with the same packing and shipment format.

EFFECTIVITY

Starting July 1st, 2015, products in the affected part list manufactured at TSMC wafer Fab may begin shipping. After July 1st, 2015, the products shipped to customers could be either wafer fabricated at TSMC or ASM.

PRODUCT ID (DESCRIPTION)

MICRF112YMM TR
MICRF112YMU TR
MICRF113YM6 TR

DESCRIPTION OF CHANGE

Micrel has qualified TSMC in Taiwan as an alternative wafer fabrication site in addition to the current ASM Fab in Austria.

EFFECT OF CHANGE

There is no change in form, fit or function of the product. Wafer fabricated from TSMC meets the data sheet and is electrically similar to the product fabricated at AMS. No significant difference in application performance was found. A reliability evaluation was performed and all products passed our reliability requirements.



QUALIFICATION

TSMC is already our qualified wafer fabrication subcontractors for many devices. Micrel customers have been receiving Micrel parts fabricated from TSMC since 2001. We performed a complete reliability assessment. The reliability report is attached.



RELIABILITY REPORT

DATE : 08/20/2014

QUALITY ENG :	PURPOSE:
H.GRIMM	TSMC FAB _ Quick Radio CMOS 0.35 Products

PART NUMBER	PACKAGE TYPE	ASSEMBLY LOCATION	FAB LOCATION	PROCESS NAME
MICRF112_MICRF113	MSOP-10L_SOT23-6L	IPOH,MALASIA_STARS,CHINA	TSMC	CMOS 0.35

DIE QUALIFICATION RESULTS

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	168 HR Rej/ss	1000 HR Rej/ss	COMMENTS
HTOL High Temperature Operating Life Test	JESD22, Method 108 TA= + 125°C VCC = 5.5V	1417	PC62280.3MNB	0/77	0/77	
		1415	PC62280.1MNB	0/77	0/77	
		1419	PC62280.2MNJ	0/77	0/77	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	168 HR Rej/ss	COMMENTS	
ELFR Early Life Failures Operating Life Test	JESD22, Method 108 TA= + 125°C VCC = 5.5V	1417	PC62280.3MNB	0/910	ELFR 0/1064	
		1415	PC62280.1MNB	0/77		
		1419	PC62280.2MNJ	0/77		

ELECTROSTATIC DISCHARGE

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	STRESS	RESULT Rej/ss	COMMENTS
ESD-HBM Human Body Model ATE Test @ Room +25C	R= 1500 Ohms C= 100 pF 1X +/- Voltage	1417	PC62280.3MNB	+/-500V	0/3	
				+/-1000V	0/3	
				+/-1500V	0/3	
		1415	PC62280.1MNB	+/-2000V	0/3	
				+/-3000V	0/3	
				+/-500V	0/3	
		1419	PC62280.2MNJ	+/-1000V	0/3	
				+/-1500V	0/3	
				+/-2000V	0/3	
1419	PC62280.2MNJ	+/-3000V	0/3			
		+/-500V	0/3			
		+/-1000V	0/3			
ESD-MM Machine Model ATE Test @ Room +25C	R= Zero_Ohm C= 200_pF 1X +/- Voltage	1419	PC62280.2MNJ	+/-1500V	0/3	
				+/-200V	0/3	
				+/-100V	0/3	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	STRESS	RESULT Rej/ss	COMMENTS



LATCH-UP	JESD-78 TA = +25°C	1419	PC62280.2MNJ	I/O LU O/V LU	0/6 0/6	
PACKAGE QUALIFICATION RESULTS						
TEST DESCRIPTION	METHOD/CONDITIONS	LOT ID.	DATE CODE	Rej/ss	L1 PRE-CONDITIONING FLOW	
<i>Level 1 Pre-conditioning Flow</i>	JESD22-A113	1417 1415 1419	PC62280.3MNB PC62280.1MNB PC62280.2MNJ	0/220 0/218 0/220	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	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	COMMENTS	
PRESSURE POT <i>With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A102 Ta = +121°C/100%RH 15 PSIG	1417 1415 1419	PC62280.3MNB PC62280.1MNB PC62280.2MNJ	0/45 0/45 0/45		
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	192 HR Rej/ss	COMMENTS
HAST <i>With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A110 (BIASED) Ta= +131°C/85%RH JESD22-A118 (UNBIASED)	1417 1415 1419	PC62280.3MNB PC62280.1MNB PC62280.2MNJ	0/45 0/45 0/45	0/45 0/45 0/45	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	500 CY Rej/ss	1000 CY Rej/ss	COMMENTS
TEMP CYCLE <i>With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A104 Ta = -65°C / +150°C Ta = -40°C / +125°C	1417 1415 1419	PC62280.3MNB PC62280.1MNB PC62280.2MNJ	0/45 0/45 0/45	0/45 0/45 0/45	
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	1000 HR Rej/ss		
HTSL <i>High Temperature Storage Life</i> <i>With Level 1 Pre-conditioning</i> Tpeak + 260°C 3X Reflow	JESD22-A103 Ta = +150°C	1417 1415 1419	PC62280.3MNB PC62280.1MNB PC62280.2MNJ	0/76 0/76 0/76		
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.				

