



March 13, 2015
PPCN #150004

PROCESS/ PRODUCT CHANGE NOTIFICATION

This is to inform you that Micrel Inc has qualified an improved lead frame for TMLF[®] (or TQFN) 1x1-4L packages. The modified lead frame design will improve the testability of our products.

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

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TYPE OF CHANGE

We are improving our lead frame design for TMLF1x1-4L packages by connecting the paddle to the ground pin for a better testability. Other than this additional connection, the package type, material, dimension, form, fit and function will not be affected. These products will be shipped with the same packing and shipment format.

EFFECTIVITY

Starting June 1st, 2015, Micrel will begin to assemble the listed devices with the improved lead frame, final test and drop ship to customers.

PRODUCT ID (DESCRIPTION)

See the product list in the attached Excel file "Part list for PPCN 150004 Lead frame improvement for TMLF1x1-4L" for Micrel's products that would be assembled with the improved lead frame.

DESCRIPTION OF CHANGE

Micrel is improving our lead frame design for TMLF1x1-4L packages by connecting the paddle to the ground pin for a better testability. Other than this additional connection, the package type, material, dimension, form, fit and function will not be affected.

EFFECT OF CHANGE

Except the lead frame layout change to connect the paddle to the ground pin, there is no change in form, fit or function of the product. There is no change in the Si die.

MLF[®] is a trademark of Amkor



QUALIFICATION

We attach a representative reliability report for qualifying products assembled with the improved lead frame.



RELIABILITY REPORT

DATE: 2/26/2015

QUALITY ENG:	PURPOSE: Qualify new fused Lead Frame design for TMLF1010_4L Package					
HG	CR140208					
ASSEMBLY	PACKAGE TYPE :	MSL	MOLD COMP.	DIE ATTACH	LOT #	FAB PROCESS
Chengdu, China MIC5365-3.3YMT	TMLF 1010-4L NiPdAu Plating PPF- ASM	LEVEL 1	SUMITOMO EME-G770HP	ABLESTIK 8290	DA19422MQF DA19422MQG DA19422MQH	CSI 0.5

QUALIFICATION RESULTS :

TEST DESCRIPTION	METHOD/CONDITIONS	LOT ID.	DATE CODE	POST ATE Rej/ss		
Level 1 Pre-conditioning Flow	JESD22-A113 PRECONDITIONING:	DA19422MQF	1432	0/600		
	STEP1-> ELECTRICAL TEST	DA19422MQG	1432	0/600		
	STEP2-> EXTERNAL VISUAL	DA19422MQH	1432	0/600		
	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	LOT #	DATE CODE	168 HR Rej/pass	1000 HR Rej/pass	COMMENTS
HTOL <i>High Temperature Operating Life With Level 1 Pre-conditioning</i>	JESD22-A108 Ta= + 125°C Vcc = Operating Max	DA19422MQF	1432	0/77	0/77	
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	96 HR Rej/pass	COMMENTS	
PRESSURE POT With Level 1 Pre-conditioning	JESD22-A102	DA19422MQF	1432	0/77		
	Ta = +121°C/100%RH	DA19422MQG	1432	0/77		
	15 PSIG	DA19422MQH	1432	0/77		
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	DA19422MQF	1432	0/77	0/77	
	Ta = -65°C / +150°C	DA19422MQG	1432	0/77	0/77	
		DA19422MQH	1432	0/77	0/77	



TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	1000 HR Rej/pass	2000 HR Rej/pass	
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103 Ta = +150°C	DA19422MQF	1432	0/76	0/76	
		DA19422MQG	1432	0/76	N/A	
		DA19422MQH	1432	0/76	N/A	
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	250 HR Rej/pass	500 HR Rej/pass	1000 HR Rej/pass
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103 Ta = +175°C	DA19422MQF	1432	0/76	0/76	0/76
		DA19422MQG	1432	0/76	0/76	0/76
		DA19422MQH	1432	0/76	0/76	0/76
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	100 HR Rej/pass	200 HR Rej/pass	400 HR Rej/pass
HTSL High Temperature Storage Life With Level 1 Pre-conditioning	JESD22-A103 Ta = +200°C	DA19422MQF	1432	0/76	0/76	0/76
		DA19422MQG	1432	0/76	0/76	0/76
		DA19422MQH	1432	0/76	0/76	0/76
TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	96 HR Rej/pass	192 HR Rej/pass	
HAST With Level 1 Pre-conditioning	Ta= +131°C/85%RH JESD22-A118	DA19422MQF	1432	0/77	0/77	
		DA19422MQG	1432	0/77	0/77	
		DA19422MQH	1432	0/77	0/77	

TEST DESCRIPTION	METHOD/CONDITIONS	LOT #	DATE CODE	P / F	COMMENTS
RADIOGRAPHIC X-RAY	MIL STD 883 TM2010	DA19422MQF	1432	5 / 0	PASS
		DA19422MQG	1432	5 / 0	
		DA19422MQH	1432	5 / 0	

PART NUMBER	PKG-TYPE
MIC5317-1.0YMT TR	TMLF1x1-4L
MIC5317-1.2YMT TR	TMLF1x1-4L
MIC5317-1.5YMT TR	TMLF1x1-4L
MIC5317-1.8YMT TR	TMLF1x1-4L
MIC5317-2.1YMT TR	TMLF1x1-4L
MIC5317-2.5YMT TR	TMLF1x1-4L
MIC5317-2.8YMT TR	TMLF1x1-4L
MIC5317-3.0YMT TR	TMLF1x1-4L
MIC5317-3.3YMT TR	TMLF1x1-4L
MIC5361-1.0YMT TR	TMLF1x1-4L
MIC5361-1.2YMT TR	TMLF1x1-4L
MIC5361-1.3YMT TR	TMLF1x1-4L
MIC5361-1.5YMT TR	TMLF1x1-4L
MIC5361-1.8YMT TR	TMLF1x1-4L
MIC5361-2.0YMT TR	TMLF1x1-4L
MIC5361-2.5YMT TR	TMLF1x1-4L
MIC5361-2.6YMT TR	TMLF1x1-4L
MIC5361-2.7YMT TR	TMLF1x1-4L
MIC5361-2.85YMT TR	TMLF1x1-4L
MIC5361-2.8YMT TR	TMLF1x1-4L
MIC5361-3.0YMT TR	TMLF1x1-4L
MIC5361-3.1YMT TR	TMLF1x1-4L
MIC5361-3.3YMT TR	TMLF1x1-4L
MIC5362-1.0YMT TR	TMLF1x1-4L
MIC5362-1.1YMT TR	TMLF1x1-4L
MIC5362-1.2YMT TR	TMLF1x1-4L
MIC5362-1.3YMT TR	TMLF1x1-4L
MIC5362-1.5YMT TR	TMLF1x1-4L
MIC5362-1.8YMT TR	TMLF1x1-4L
MIC5362-2.0YMT TR	TMLF1x1-4L
MIC5362-2.1YMT TR	TMLF1x1-4L
MIC5362-2.5YMT TR	TMLF1x1-4L
MIC5362-2.6YMT TR	TMLF1x1-4L
MIC5362-2.7YMT TR	TMLF1x1-4L
MIC5362-2.85YMT TR	TMLF1x1-4L
MIC5362-2.8YMT TR	TMLF1x1-4L
MIC5362-3.0YMT TR	TMLF1x1-4L
MIC5362-3.1YMT TR	TMLF1x1-4L
MIC5362-3.3YMT TR	TMLF1x1-4L
MIC5365-1.0YMT TR	TMLF1x1-4L
MIC5365-1.2YMT TR	TMLF1x1-4L
MIC5365-1.5YMT TR	TMLF1x1-4L
MIC5365-1.8YMT TR	TMLF1x1-4L
MIC5365-2.0YMT TR	TMLF1x1-4L
MIC5365-2.5YMT TR	TMLF1x1-4L
MIC5365-2.6YMT TR	TMLF1x1-4L
MIC5365-2.7YMT TR	TMLF1x1-4L
MIC5365-2.85YMT TR	TMLF1x1-4L
MIC5365-2.8YMT TR	TMLF1x1-4L
MIC5365-2.9YMT TR	TMLF1x1-4L
MIC5365-3.0YMT TR	TMLF1x1-4L

MIC5365-3.1YMT TR	TMLF1x1-4L
MIC5365-3.3YMT TR	TMLF1x1-4L
MIC5365-3.4YMT TR	TMLF1x1-4L
MIC5366-1.0YMT TR	TMLF1x1-4L
MIC5366-1.2YMT TR	TMLF1x1-4L
MIC5366-1.5YMT TR	TMLF1x1-4L
MIC5366-1.8YMT TR	TMLF1x1-4L
MIC5366-2.0YMT TR	TMLF1x1-4L
MIC5366-2.1YMT TR	TMLF1x1-4L
MIC5366-2.5YMT TR	TMLF1x1-4L
MIC5366-2.6YMT TR	TMLF1x1-4L
MIC5366-2.7YMT TR	TMLF1x1-4L
MIC5366-2.85YMT TR	TMLF1x1-4L
MIC5366-2.8YMT TR	TMLF1x1-4L
MIC5366-2.9YMT TR	TMLF1x1-4L
MIC5366-3.0YMT TR	TMLF1x1-4L
MIC5366-3.1YMT TR	TMLF1x1-4L
MIC5366-3.3YMT TR	TMLF1x1-4L
MIC5375-2.8YMT TR	TMLF1x1-4L
MIC5376-2.8YMT TR	TMLF1x1-4L
MIC5390-2.5YMT TR	TMLF1x1-4L
MIC5390-2.8YMT TR	TMLF1x1-4L
MIC5390-3.3YMT TR	TMLF1x1-4L
MIC5391-2.8YMT TR	TMLF1x1-4L
MIC5391-1.2YMT TR	TMLF1x1-4L
MIC5501-1.8YMT TR	TMLF1x1-4L
MIC5501-3.0YMT TR	TMLF1x1-4L
MIC5502-1.8YMT TR	TMLF1x1-4L
MIC5502-2.8YMT TR	TMLF1x1-4L
MIC5502-3.0YMT TR	TMLF1x1-4L
MIC5503-1.2YMT TR	TMLF1x1-4L
MIC5503-1.8YMT TR	TMLF1x1-4L
MIC5504-1.2YMT TR	TMLF1x1-4L
MIC5504-1.8YMT TR	TMLF1x1-4L
MIC5504-2.2YMT TR	TMLF1x1-4L
MIC5504-2.5YMT TR	TMLF1x1-4L
MIC5504-2.8YMT TR	TMLF1x1-4L
MIC5504-3.0YMT TR	TMLF1x1-4L
MIC5504-3.1YMT TR	TMLF1x1-4L
MIC5504-3.3YMT TR	TMLF1x1-4L
MIC5524-1.2YMT TR	TMLF1x1-4L
MIC5524-1.8YMT TR	TMLF1x1-4L
MIC5524-2.5YMT TR	TMLF1x1-4L
MIC5524-2.8YMT TR	TMLF1x1-4L
MIC5524-3.0YMT TR	TMLF1x1-4L
MIC5524-3.3YMT TR	TMLF1x1-4L