



September 4, 2014
PPCN #140011

PROCESS/ PRODUCT CHANGE NOTIFICATION

This is to inform you that Micrel Inc has qualified Unisem Advanced Technologies (UAT) in Ipoh, Malaysia as an alternative chip assembly, die probing, and drop shipment subcontractor site for Wafer Level Chip Scale packages (WLCSP). This location is in addition to the current Jiangyin Changdian Advanced Packaging Co. (JCAP), China or SILTECH, China as WLCSP subcontractors. This change adds more capacity and provides the flexibility to enable Micrel to continue to make on-time deliveries to our growing end customers.

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

NAME: Hank Chou
EMAIL: hank.chou@micrel.com
PHONE: 408-435-2422

TYPE OF CHANGE

We are adding UNISEM UAT as an alternative WLCSP subcontractor. The package type, form, fit and function will not be affected. These products will be shipped with the same packing and shipment format.

EFFECTIVITY

Effective Nov 30, Micrel may begin shipment of the WLCSP products from Unisem UAT with the listed parts. In the future, these products that shipped to customers could be either from JCAP, SILTECH or Unisem UAT.

PRODUCT ID (DESCRIPTION)

Please refer to the part numbers listed in the attached spread sheet "PPCN 140011 part list to qualify UNISEM UAT for WLCSP" for Micrel's WLCSP products that could be assembled and shipped at UNISEM UAT site.

DESCRIPTION OF CHANGE

Micrel has qualified Unisem UAT for assembly, test and shipment of the listed Micrel WLCSP products. See the table for material comparison.



Site	Solder ball	Backside coat	UBM	Polyimide
UNISEM	SNAC105	HYSOL/Lintec	Ti/Cu	HD4100
JCAP	SAC105	Lintec	Ti/Cu	HD4100
SiITech	SAC266	LM8895	Ti/Cu/Ni/Cu	HD8820

EFFECT OF CHANGE

Except the die backside coating material at assembly, there is no change in data sheet and the form, fit, or function of the products. The land pattern, ball finish, ball layout, and naming are the same.

The parts made at JCAP or SILTECH will have a “CN” country of origin mark; and the parts made at UNISEM UAT will have a “MY” country of origin mark.

QUALIFICATION

UNISEM has been Micrel’s qualified assembly and test subcontractors. UNISEM is already qualified and manufacturing Flip Chip (FC) packages in high volume production. Traceability is maintained by part number, date code, lot number, and country of origin (CO) for all products. We attach a representative reliability report to qualify WLCSP products assembled at UNISEM UAT.



RELIABILITY REPORT

DATE: 8/14/2014

QUALITY ENG :	PURPOSE:
H.GRIMM	ASSEMBLY SITE QUALIFICATION UNISEM ADVANCED TECHNOLOGY, IPOH MALAYSIA

PART NUMBER	PACKAGE TYPE	ASSEMBLY LOCATION	FAB LOCATION	PROCESS NAME
MIC2782YCS	WLP08120-6BUMP	UNISEM_UAT MALAYSIA	Korea Dongbu	Dongbu .18AN

ESD RATINGS	LATCH UP RATINGS	MSL	Theta JA	RSIC	RoHS
2000V HBM 200V MM	I/O TRIGGER @ +/-100mA @ Vin 3.6v O/V TEST @ 1.5X VCC	LEVEL 1			Ball > SNAC105 size - pitch 250mm - 400mm

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	1414	M2094452MQD	0/77	0/77	

PACKAGE QUALIFICATION RESULTS

TEST DESCRIPTION	METHOD/CONDITIONS	LOT ID.	DATE CODE	Rej/ss	L1 PRE-CONDITIONING FLOW
PCB Assembly Flow	JESD22-A113	1414	M2094452MQD	0/127	STEP1-> ELECTRICAL TEST STEP2-> PCB ASSEMBLY ON RIDER CARDS STEP3-> 1X IR REFLOW +260c STEP4-> ELECTRICAL TEST

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	COMMENTS
PRESSURE POT	JESD22-A102 Ta = +121°C/100%RH 15 PSIG	1414 1414 1414 1410 1410 1410	M2094452MQB M2094452MQD M2094452MQA M3074300MQA M3074300MQC M3074300MQD	0/45 0/44 0/45 0/45 0/45 0/45	MIC2782DL YCS MIC2782DL YCS MIC2782DL YCS MIC2782EL YCS MIC2782EL YCS MIC2782EL YCS

TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	96 HR Rej/ss	192 HR Rej/ss	COMMENTS



HAST	JESD22-A110 (BIASED) Ta= +131°C/85%RH JESD22-A118 (UNBIASED)	1414 1410 1410 1410	M2094452MQA M3074300MQA M3074300MQC M3074300MQD	0/45 0/45 0/45 0/45	0/45 0/45 0/44	MIC2782DL YCS MIC2782EL YCS MIC2782EL YCS MIC2782EL YCS
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	500 CY Rej/ss	1000 CY Rej/ss	COMMENTS
TEMP CYCLE	JESD22-A104 Ta = -65°C / +150°C	1410 1410 1410 1414 1414 1414	M3074300MQD M3074300MQC M3074300MQA M2094452MQD M2094452MQB M2094452MQA	0/45 0/44 0/45 0/45 0/45 0/44	0/44 0/45 0/45 0/45	MIC2782EL YCS MIC2782EL YCS MIC2782EL YCS MIC2782DL YCS MIC2782DL YCS MIC2782DL YCS
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	1000 HR Rej/ss	COMMENTS	
HTSL <i>High Temperature Storage Life</i>	JESD22-A103 Ta = +150°C	1414 1410	M2094452MQD M3074300MQA	0/76 0/76	MIC2782DL YCS MIC2782EL YCS	
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.				
TEST DESCRIPTION	METHOD/CONDITIONS	DATE CODE	LOT ID.	F/P	COMMENTS	
PHYSICAL DIMENSIONS	MIL STD 883	1410 1410 1410	M3074300MQA M3074300MQC M3074300MQD	0 / 1 0 / 1 0 / 1	MIC2782EL YCS MIC2782EL YCS MIC2782EL YCS	