February 13, 2013
PPCN #130003

PROCESS/ PRODUCT CHANGE NOTIFICATION

This is to inform you that Micrel Inc has qualified PDIP packages at CIRTEK, Philippines as an alternative assembly site. This manufacturing subcontractor is in addition to the current Unisem Batam, Indonesia as qualified assembly locations for these products. This change adds more capacity and provides for the flexibility of assembly processing locations. This will enable Micrel to continue to make on-time deliveries to our growing end customers.
If you have any questions concerning this change, please contact:

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TYPE OF CHANGE

We are adding CIRTEK as an assembly source in addition to the current Unisem Batam. The 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 May 10, 2013, Micrel may begin to deliver the listed devices from CIRTEK. After May 10, 2013, the products shipped to customers could be either assembled from Unisem Batam or CIRTEK.

PRODUCT ID (DESCRIPTION)

See the product list in the attached Excel file “PPCN 130003 part list add CIRTEK additional assembly site for PDIP” for Micrel’s products that would be assembled at Unisem Batam or CIRTEK site.

DESCRIPTION OF CHANGE

Micrel has qualified CIRTEK, Philippines for PDIP-08L, -14L, -16L, -18L, -20L, -22L, -24L, -40L package assembly of the listed Micrel products. This will provide additional capacity for assembly of these products.

EFFECT OF CHANGE

There is no change in form, fit or function of the product. The land pattern, lead finish, lead layout, naming, and lead count are the same. There is no change in the die or testing.

QUALIFICATION

CIRTEK is Micrel's qualified assembly subcontractor. CIRTEK is already qualified and manufacturing SOT-143 and SOT-23 packages in high volume production. Traceability is maintained by date code and lot number, and country of origin (CO) for all products. The parts made at Unisem Batam will have an "IN" country of origin mark; and the parts made at CIRTEK will have a "PH" country of origin mark. We attach a representative reliability report for qualifying products assembled at CIRTEK, Philippines.

RELIABILITY REPORT (PDIP-18L)

DATE : 1/21/2013

QUALITY ENG :	**PURPOSE : New Assembly Site**						
H. Grimm	CIRTEK 18L-PDIP QUALIFICATION						
QUAL VEHICLE:	**PACKAGE TYPE :**	**ASSEMBLY LOC**	**D/C #**	**LOT #**	**FAB #**	**M/C**	**Plating**
MM5841YN	PDIP-18L	CIRTEK, Philippines	1211	AA45323MEA	San Jose	G600	Matte Tin
MM5841YN	PDIP-18L	CIRTEK, Philippines	1212	AA45323MEB	San Jose	G600	Matte Tin

QUALIFICATION RESULTS

TEST DESCRIPTION	**CONDITIONS**	**MSL SOAK**	**LOT ID.**	**ATE** (Rej/SS)	**COMMENTS**
IR REFLOW	JEDEC-STD 20C 3X Reflow Tpeak=+260C	Level 1	AA45323MEA	0/22	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**96 HR (rej/ss)**	**COMMENTS**
PRESSURE POT	SPEC# 520-1003 Ta = +121°C/100%RH 15 PSIG	1211 1212	AA45323MEA AA45323MEB	0/45 0/45	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**1000 Cy** (rej/ss)	**COMMENTS**
TEMPERATURE CYCLE	MIL-STD-883 TM. 1010 Ta = -65°C/+150°C	1211 1212	AA45323MEA AA45323MEB	0/77 0/77	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**1000 HR** (rej/ss)	**COMMENTS**
HTSL High Temperature Storage Life	MIL-STD-883 TM. 1008 Ta = +150°C	1211	AA45323MEA	0/76	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**500 HR** (rej/ss)	**1000 HR** (rej/ss)	**COMMENTS**
HTOL **High Temperature Operating Life Test**	JESD22-A108 Ta = +125°C Vcc = +16 V	1211 1212	AA45323MEA AA45323MEB	0/77 0/77	0/77 0/77	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**500 HR** (rej/ss)	**1000 HR** (rej/ss)	**COMMENTS**

Un-Bias Moisture Life Test	SPEC 1000-0014 Ta = +85°C/85%RH	1211 1212	AA45323MEA AA45323MEB	0/77 0/77	0/77 0/77	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**STRESS**	**RESULT** (rej/ss)	**COMMENTS**
ESD-CDM	JESD-22 Method C101C TA = +25°C		AA45323MEA	+/-500V +/-1000V	0/3 0/3	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**DATE CODE**	**LOT ID.**	**STRESS**	**RESULT** (rej/ss)	**COMMENTS**
ESD-HBM	MIL-STD 883 Method 3015 TA = +25°C		AA45323MEA	+/-500V +/-1000V	0/3 2/3	
TEST DESCRIPTION	**METHOD**	**DATE CODE**	**LOT**		**RESULT** (rej/ss)	**COMMENTS**
X-RAY	MIL-STD-883, TM.2012	1211 1212 1213	AA45323MEA AA45323MEB AA45323MEC		Pass Pass pass	Reference Cirtek Report
PHYSICAL DIMENSIONS	MIL-STD-883 TM.2016		AA45323MEA	0/1	pass	
TEST DESCRIPTION	**METHOD**	**DATE CODE**	**LOT**	**SOLDER TEMP.**	**RESULT** (rej/ss)	**SOLDER TYPE**
SOLDERABILITY	JESD22-B102D, METHOD 1	1211 1212	AA45323MEA	+245C +245C +215C	0/5 0/5 0/5	SAC Sn Sn
TEST DESCRIPTION	**METHOD**	**PART NO.**	**LOT**	**DATE CODE**	**RESULT** (rej/ss)	**COMMENTS**
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.				

RELIABILITY REPORT (PDIP-40L)

DATE: 1/22/2013

QUALITY ENG :	**PURPOSE : New Assembly Site**
H. Grimm	CIRTEK 40L-PDIP QUALIFICATION

QUAL VEHICLE:	**PACKAGE TYPE :**	**ASSEMBLY LOC**	**D/C #**	**LOT #**	**FAB #**	**M/C**	**PROCESS**
MM5451YN	PDIP-40L	CIRTEK, Philippines	1217	AA42999MEA	San Jose	G600	NM
MM5451YN	PDIP-40L	CIRTEK, Philippines	1218	AA42999MEB	San Jose	G600	NM
MM5451YN	PDIP-40L	CIRTEK, Philippines	1222	AA42999MEC	San Jose	G600	NM

QUALIFICATION RESULTS

TEST DESCRIPTION	**CONDITIONS**	**MSL SOAK**	**LOT ID.**	**ATE** (Rej/SS)	**COMMENTS**
IR REFLOW	JEDEC-STD 20C 3X Reflow Tpeak=+260C	Level 1	7A04584MSA	0/76	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**96 HR** (rej/ss)	**COMMENTS**
PRESSURE POT	SPEC# 520-1003 Ta = +121°C/100%RH 15 PSIG	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	0/45 0/45 0/45	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**1000 Cy** (rej/ss)	**COMMENTS**
TEMPERATURE CYCLE	MIL-STD-883 TM. 1010 Ta = -65°C/+150°C	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	0/77 0/77 0/77	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**1000 HR** (rej/ss)	
HTSL High Temperature Storage Life	MIL-STD-883 TM. 1008 Ta = +150°C	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	0/76 0/76 0/76	

TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**500 HR** (rej/ss)	**1000 HR** (rej/ss)	**COMMENTS**

Un-Bias Moisture Life Test	SPEC 1000-0014 Ta = +85°C/85%RH	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	0/45 0/45 0/45	0/45 0/45 0/45	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**STRESS**	**RESULT** (rej/ss)	**COMMENTS**
ESD-CDM	JESD-22 Method C101C TA = +25°C	0830	7A04584MSA	+/-500V +/-1000V	0/3 0/3	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**STRESS**	**RESULT** (rej/ss)	**COMMENTS**
ESD-HBM	MIL-STD 883 Method 3015 TA = +25°C	0830	7A04584MSA	+/-500V +/-1000V	0/3 1/3	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**STRESS**	**RESULT** (rej/ss)	**COMMENTS**
ESD-MM	JESD-22 Method A115 TA = +25°C	0830	7A04584MSA	+/-100V +/-200V	0/3 3/3	
TEST DESCRIPTION	**METHOD/CONDITIONS**	**D/C #**	**LOT ID.**	**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	0830	7A04584MSA	I/O LU O/V LU	0/6 0/6	
TEST DESCRIPTION	**METHOD**	**D/C #**	**LOT ID.**	**RESULT**	**RESULT** (rej/ss)	**COMMENTS**
X-RAY	MIL-STD-883, TM.2012	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	Pass Pass pass	0/5 0/5 0/5	
PHYSICAL DIMENSIONS	MIL-STD-883 TM.2016	1217 1218 1222	AA42999MEA AA42999MEB AA42999MEC	Pass Pass pass	0/1 0/1 0/1	

NOTE: PER JESD46, LACK OF ACKNOWLEDGEMENT OF THE PPCN WITHIN 30 DAYS OF THE NOTIFICATION DATE CONSTITUTES CUSTOMER'S ACCEPTANCE OF THE CHANGE.

TEST DESCRIPTION	METHOD	D/C #	LOT ID.	SOLDER TEMP.	RESULT (rej/ss)	STEAM AGING
SOLDERABILITY **Performed by Cirtek**	JESD22-B102D, METHOD 1	0831	7A04584MSB	+245C	0/2 0/2 0/3	0 HR 4 HR 8 HR
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.				