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PRODUCT / PROCESS CHANGE NOTIFICATION  
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15-DEC-2000

**SUBJECT:** Product/Process Change Notification #10510

**TITLE:** Qualification Of Pacific Semiconductor Inc (PSI) For  
Assembly/Test of Rectifiers in TO220 Package.

**EFFECTIVE DATE:** 24-Mar-2001

**AFFECTED CHANGE CATEGORY(S):**

Subcontractor Assembly Site  
Subcontractor Test Site

**AFFECTED PRODUCT DIVISION(S):**

Bipolar Discretets Products Division

**ADDITIONAL RELIABILITY DATA:** Available  
Contact your local ON Semiconductor Sales Office  
or Bob Cook <R13943@onsemi.com>

**SAMPLES:** Contact Below  
Contact your local ON Semiconductor Sales Office  
or Bob Cook <R13943@onsemi.com>

**FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:**  
Contact Sales Office or Bob Cook <R13943@onsemi.com>

**DISCLAIMER:**

ON Semiconductor will consider this change approved unless specific conditions of acceptance are provided in writing within 30 days of receipt of this notice. To do so, contact your local ON Semiconductor sales office.

**DESCRIPTION AND PURPOSE:**

ON Semiconductor is pleased to announce that it has qualified our subcontractor, Pacific Semiconductor Incorporated (located in the Philippines), as an additional assembly and test site for our TO220 Rectifier Products. Pacific Semiconductor Incorporated (PSI) has been a subcontractor for ON Semiconductor for over 20 years and is QS-9000 certified. In addition, PSI has been a qualified supplier of T0220 Bipolar devices since 1993. This change will not affect the form, fit, or function of these devices. All device parameters will continue to meet all data sheet specifications, and reliability will continue to meet or exceed ON Semiconductor standards.



**Qualification Of PSI for Assy/Test of Rectifiers in TO220 #10510**

**QUALIFICATION PLAN:**

Rectifier TO220 reliability qualification is by similarity to existing TO220 (Bipolar Power and Thyristor) reports, per the test plans below.

**Test Conditions**

HTRB Vces=80% rated, Ta=175degC , 1000 hrs.  
 Temp Cycle Air to Air, -65 to +150 C, 1000 cycles  
 DPA Random sample of TC and H3TRB units  
 HAST Vces=100% rated, Ta=135 C, RH= 100%,  
 PSIG=14.7, 72 hrs.  
 Autoclave Ta=121 C, RH=100%, PSIG=15, 96 hrs  
 H3TRB Vr=80% rated, Ta=85 C, RH= 85%,  
 1000 hrs.  
 IOL Ta=25 C, delta Tj =>125 C,  
 3.5 minutes on/off, 10000 cycles  
 High Temp Storage 175 degC, 1000 hrs.  
 Physical Dimension Per Case Outline Drawing  
 Bond Strength Wire Pull per 12MSB17722C, AEC101  
 Die Bond (Die Shear) Per 12MSB17722C, AEC101  
 External Visual Mil-Std-750, Method 2071  
 Res. To Solder Heat 260 C, Td=10s  
 Solderability Mil-Std-750, Method 2026, Steam Age=8hrs

Full tri-temperature electrical characterization of Rectifier qualification vehicles (outlined below) per datasheet parameters.

**Qualification Vehicle Justification:**

<u>Family</u>	<u>Io</u>	<u>Qualification Device</u>	<u>Reason Chosen</u>
Bipolar Power	5 A	TIP122	Largest Die (Reliability)
Thyristor	12A	MAC12N	Highest Voltage (Reliability)
Thyristor	16A	MAC16CN	Largest Die, Highest Voltage (Reliability)
Schottky Rectifier	25 A	MBR2515L	Largest Die (Elect. Char.)
Schottky Rectifier	20 A	MBR20200CT	Highest Voltage (Elect. Char.)
Ultrafast Rectifier	10 A	MUR10150E	Highest Voltage (Elect. Char.)

**RELIABILITY DATA SUMMARY:**

Reliability Results: Bipolar Power **TIP122**

Test Description	Interval	Control Rej/SS	Lot 1 Rej/SS	Lot 2 Rej/SS	Lot 3 Rej/SS
HTRB	1000 hrs	0/80	0/80	0/80	0/80
Temp Cycle	1000 cyc	0/80	0/80	0/80	0/80
HAST	72 hrs	0/80	0/80	0/80	0/80
H3TRB	1000 hrs	0/80	0/80	0/80	0/80
IOL	10000 cyc	0/80	0/80	0/80	0/80
High Temp Storage	1000 hrs	0/80	0/80	0/80	0/80

**Qualification Of PSI for Assy/Test of Rectifiers in TO220 #10510**Reliability Results: Thyristor **MAC12N**

Test Description	Interval	Rej/SS
HTRB	1000 hrs	0/260
Temp Cycle	1000 cyc	0/80
DPA after Temp Cycle	N/A	0/2
Autoclave	96 hrs	0/200
H3TRB	1000 hrs	0/80
DPA after H3TRB	N/A	0/8
IOL	10000 cyc	0/80
Physical Dimension	N/A	0/30
Bond Strength	N/A	0/10
Die Bond (Die Shear)	N/A	0/5
External Visual	N/A	0/80
Res. To Solder Heat	N/A	0/30
Solderability	N/A	0/10

Reliability Results: Thyristor **MAC16CN**

Test Description	Interval	Rej/SS
HTRB	1000 hrs	0/200
Temp Cycle	1000 cyc	0/160
DPA after Temp Cycle	N/A	0/4
Autoclave	96 hrs	0/200
H3TRB	1000 hrs	0/160
DPA after H3TRB	N/A	0/4
IOL	10000 cyc	0/80
Physical Dimension	N/A	0/30
Bond Strength	N/A	0/20
Die Bond (Die Shear)	N/A	0/10
External Visual	N/A	0/80
Res. To Solder Heat	N/A	0/30
Solderability	N/A	0/20

**ELECTRICAL CHARACTERISTIC SUMMARY:**

Electrical Characterization data to be available WW03, 2001.

**CHANGED PART IDENTIFICATION:**

Customers may receive these products manufactured at PSI starting with Date Code 0107 or later. The marking on the products assembled and tested at PSI will include Site Code: "CQ".



**Qualification Of PSI for Assy/Test of Rectifiers in TO220 #10510**

**AFFECTED DEVICE LIST:**

**PART**

BYV32-200  
BYW29-100  
BYW29-200  
BYW51-200  
BYW80-100  
BYW80-200  
MBR10100  
MBR1035  
MBR1045  
MBR1060  
MBR1080  
MBR1090  
MBR1535CT  
MBR1545CT  
MBR1545CTP  
MBR16100CT  
MBR1635  
MBR1645  
MBR20100CT  
MBR20100CTP  
MBR20200CT  
MBR20200CTP  
MBR2030CTL  
MBR2045CT  
MBR2045CTP  
MBR2060CT  
MBR2080CT  
MBR2090CT  
MBR2515L  
MBR2535CT  
MBR2535CTL  
MBR2545CT  
MBR2545CTP  
MBR3045ST  
MBR735  
MBR745  
MSR1560  
MSR860  
MUR10120E  
MUR10150E  
MUR1510  
MUR1515  
MUR1520  
MUR1540  
MUR1550  
MUR1560  
MUR1610CT  
MUR1610CTR  
MUR1615CT  
MUR1620CT  
MUR1620CTR  
MUR1640CT  
MUR1650CT  
MUR1660CT  
MUR2020R  
MUR5150E  
MUR620CT  
MUR805



**Qualification Of PSI for Assy/Test of Rectifiers in T0220 #10510**

**AFFECTED DEVICE LIST:**

**PART**  
MUR810  
MUR8100E  
MUR815  
MUR820  
MUR840  
MUR860  
MUR880E  
MURH840CT  
MURH860CT  
SBR81045  
SUR81620CT  
SUR81620CTR  
SUR81640CT  
SUR88100E  
SUR8820  
SUR8840