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**PRODUCT/PROCESS CHANGE NOTIFICATION**  
Generic Copy

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**15-MAY-2001**

**SUBJECT: Product/Process Change Notification #11433**

**TITLE: Final Notification - Small Signal Transistor Die Shrink for MMPQ3904, MMPQ3906, MMPQ6700, and 2N5210**

**EFFECTIVE DATE: 14-Jul-2001**

**AFFECTED CHANGE CATEGORY: Die Shrink**

**AFFECTED PRODUCT DIVISION: Bipolar Discretes Products Div**

**ADDITIONAL RELIABILITY DATA:** Available

Contact your local ON Semiconductor Sales Office or Laura Rivers <S20636@onsemi.com >

**SAMPLES:** Contact Below

Contact your local ON Semiconductor Sales Office or Monica Griffin <R39205@onsemi.com>

**FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:**

Contact Sales Office or Monica Griffin <R39205@onsemi.com>

**DISCLAIMER:**

Initial Product/Process Change Notification (IPCN) - First Notification distributed to customers. Distributed at least 120 days from the effective date of the change.

Final Product/Process Change Notification (FPCN) - Final Notification completing the notification process. Distributed at least 60 days from the effective date of the change. 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:**

This process change is to notify customers of the conversion of several of ON Semiconductor's General Purpose Small Signal devices to our 12um wafer process. This change will result in a die shrink from 14.2mils to 11.8mils. This change has been in place in other products for over 2 years.

There will be no change to the form, fit, and function of the devices. Device parameters will continue to meet all Data Book specifications, and reliability will continue to meet or exceed ON Semiconductor standards.



**Product/Process Change Notification #11433**

**QUALIFICATION PLAN:**

<u>Test</u>	<u>Conditions</u>
HTRB	Vbr=45V, Tj=150 degC , 1000 hrs.
Temp Cycle	Air to Air, -65 to +150 C, 1000 cycles.
Autoclave	Ta=121 C, RH= 100%, PSIG=15, 192 hrs.
H3TRB	Vbr=45V, Ta=85 C, RH= 85%, 1000 hrs.
IOL	Ta=25 C, delta Tj =>100 C, 2 minutes on/off, 1000 hrs.
HTSL	Ta=150 C, 1000 hrs.
HAST	Ta=130 C, 85%RH, Vbr=45V, 96 hrs.
Thermal Shock	Ta= -60 to 150C, liquid to liquid, 1000 cycles.
Solderability	Steam age = 8 hrs, Ta=245 C
Res. To Solder Heat	260 C, 1X

Qualification Vehicle Justification

Family	Qualification Device	Reason Chosen
General Purpose BJT	BC847BLT1	Same mask type in SOT-23, higher voltage, higher hfe

**RELIABILITY DATA SUMMARY:**

Reliability Tests, Additional Tests and Results: BC847BLT1

<u>Test Description</u>	<u>Lot 1</u>	<u>Lot 2</u>	<u>Lot 3</u>
HTRB	0/77	0/77	0/77
Temperature Cycle	0/77	0/77	0/77
Autoclave	0/77	0/77	0/77
H3TRB	0/77	0/77	0/77
IOL	0/77	0/77	0/77
HTSL	0/77	0/77	0/77
HAST	0/77	0/77	0/77
Thermal Shock	0/77	0/77	0/77
Die Solderability	0/10	0/10	0/10
Res. To Solder Heat	0/45	0/45	0/45

**Reliability Testing Conclusions:**

Reliability Testing shows the die meets ON Semiconductor requirements. A copy of the full Reliability Report is available upon request.

**ELECTRICAL CHARACTERISTIC SUMMARY:**

BC847BLT1: Temp. (+25 degC)

BVCBO @ Ic = 10uA

	Volts	
	CONTROL	TEST
Mean	91.2	85.9
Std Dev	6.402	1.594
Limit	40	40
Cpk	2.7	9.6

BVCEO @ Ic = 1mA

	Volts	
	CONTROL	TEST
Mean	62.64	64.16
Std Dev	1.5273	2.1442
Limit	40	40
Cpk	4.9	3.7

**Product/Process Change Notification #11433**

Vce(sat) @ Ic = 10mA, Ib = 1mA

Volts

	CONTROL	TEST
Mean	0.0700	0.0900
Std Dev	0.00162	0.00286
Limit	0.25 max	0.25 max
Cpk	37	21

Vce(sat) @ Ic = 50mA, Ib = 5mA

Volts

	CONTROL	TEST
Mean	0.13	0.16
Std Dev	0.0029	0.0063
Limit	0.4 max	0.4 max
Cpk	36	13

hfe @ Ic = 10mA, Vce = 1V

CONTROL TEST

Mean	178	155
Std Dev	5.48	14.6

**CHANGED PART IDENTIFICATION:**

Customers may receive these products manufactured with shrunk die starting with date code 0111 (ww11, 2001).

**AFFECTED DEVICE LIST:****PART**

2N5210RLRA  
MMPQ3904  
MMPQ3904R1  
MMPQ3904R2  
MMPQ3906  
MMPQ3906R1  
MMPQ3906R2  
MMPQ6700  
MMPQ6700R1