



FINAL PRODUCT/PROCESS CHANGE NOTIFICATION
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28-APR-2004

SUBJECT: ON Semiconductor Final Product/Process Change Notification #13445

TITLE: Phase #4 Die Design Change (Die Shrink) for Bipolar Power Products

EFFECTIVE DATE: 28-Jun-2004

AFFECTED CHANGE CATEGORY: Die Shrink

AFFECTED PRODUCT DIVISION: Discretes Products

ADDITIONAL RELIABILITY DATA: Available

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

SAMPLES: Contact your local ON Semiconductor Sales Office
or Mike Schager <RMF150@onsemi.com>

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:

Contact Sales Office or Jose Ramirez <RVEG40@onsemi.com>

NOTIFICATION TYPE:

Final Product/Process Change Notification (FPCN)

Final change notification sent to customers. FPCNs are issued at least 60 days prior to implementation 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 is the Final Notification for the Phase #4 of IPCN#12868. ON Semiconductor wishes to notify its Customers that some Bipolar Power Transistors have been subjected to a Die size reduction. Electrical characterization and qualification data have been completed, device parametric specifications and ratings have not changed.

RELIABILITY DATA SUMMARY:

Mask#1

TEST	2N6031		2N3773	
	Qual Lot	Control	Qual Lot	Control
HTRB	0/77	0/77	0/77	0/77
IOL	0/77	0/77	0/77	0/77
TC	0/77	0/77	0/77	0/77



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Mask#2

TEST	MJD32CT4	
	Qual Lot	Control
HTRB	0/77	0/77
H3TRB	0/77	0/77
AC	0/77	0/77
IOL	0/77	0/77
TC	0/77	0/77

Mask#3

TEST	BD441	
	Qual Lot	Control
HTRB	0/77	0/77
H3TRB	0/77	0/77
AC	0/77	0/77
IOL	0/77	0/77
TC	0/77	0/77

Mask#4

TEST	BD682		MJD112T4	
	Qual Lot	Control	Qual Lot	Control
HTRB	0/77	0/77	0/77	0/77
H3TRB	0/77	0/77	0/77	0/77
AC	0/77	0/77	0/77	0/77
IOL	0/77	0/77	0/77	0/77
TC	0/77	0/77	0/77	0/77

ELECTRICAL CHARACTERISTIC SUMMARY:

Mask#1

25DegC

Test	Condition	Limit	Unit	Stat	2N6031 - PNP	
					QUAL LOT	CONTROL
Iebo	Veb=7V	<5.00E-3	Amp	Avg/Sd	6.92E-10/3.24E-10	7.33 E-10/4.29E-10
Iceo	Vce=70V	<2.00E-3	Amp	Avg/Sd	8.72E-07/4.50E-07	6.79E-07/1.62E-07
Icbo	Vcb=140V	<2.00E-3	Amp	Avg/Sd	9.84E-09/9.33E-09	1.04E-08/1.09E-09
BVceo	IC=100mA	>140V	Volt	Avg/Sd	210.1/1.5	204.3/3.0
hFE	8A / 4V	15 - 60		Avg/Sd	37.8/1.2	39.8/3.1
hFE	16A / 4V	>4		Avg/Sd	16.8/0.5	18.9/1.4
VCE(sat)	10A/1A	<1.0	Volt	Avg/Sd	0.5868/0.0207	0.6571/0.0430
VCE(sat)	16A/4A	<2.0V	Volt	Avg/Sd	0.7989/0.0156	0.9378/0.0248
VBE(sat)	10A/1A	<1.8V	Volt	Avg/Sd	1.2767/0.0083	1.3836/0.0386
VBE(on)	8A/2V	<1.5V	Volt	Avg/Sd	1.2015/0.0040	1.2889/0.0141

Mask#1

25DegC

Test	Condition	Limit	Unit	Stat	2N3773 - NPN	
					QUAL LOT	CONTROL
Iebo	Veb=7V	<5.00E-3	Amp	Avg/Sd	8.75E-10/1.48E-09	5.95E-10/1.79E-10
Iceo	Vce=80V	<1.00E-2	Amp	Avg/Sd	6.58E-07/1.54E-07	5.16E-07/1.59E-07
Icbo	Vcb=140V	<2.0E-3	Amp	Avg/Sd	1.52E-08/1.31E-09	1.27E-08/2.76E-09
BVceo	IC=100mA	>140	Volt	Avg/Sd	182.0/1.3	181.6/4.7
hFE	8A / 4V	15 - 60		Avg/Sd	46.4/1.4	49.4/3.0
hFE	16A / 4V	>4		Avg/Sd	15.8/0.5	20.9/1.5
VCE(sat)	8A/0.8A	<1.4	Volt	Avg/Sd	0.3282/0.0045	0.3421/0.0104
VCE(sat)	16A/3.2A	<4.0	Volt	Avg/Sd	0.6635/0.0083	0.6680/0.0149
VBE(on)	8A/4V	<2.2	Volt	Avg/Sd	1.0520/0.0036	1.1220/0.0079



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Mask#2 25DegC

Test	Condition	Limit	Unit	Stat	MJD32CT4 - PNP	
					QUAL LOT	CONTROL
Iebo	Veb=5V	<1.00E-03	Amp	Avg/Sd	3.10E-09/1.15E-10	1.42E-10/7.36E-11
Iceo	Vce=60V	5.00E-05	Amp	Avg/Sd	1.49E-07/1.73E-07	2.30E-07/4.36E-09
Ices	Vce=100V	<2.00E-05	Amp	Avg/Sd	3.69E-09/2.12E-09	2.96E-09/9.05E-10
BVceo	IC=30mA	>100V	Volt	Avg/Sd	121.9/0.4	121.1/22..9
hFE	1A/4V	>25		Avg/Sd	88.5/1.4	65.5/3.4
hFE	3A/4V	10 - 50		Avg/Sd	29.2/0.6	21.3/1.0
VCE(sat)	3A/0.375A	<1.2V	Volt	Avg/Sd	0.5924/0.0116	0.6574/0.1147
VBE(on)	3A/4V	<1.8	Volt	Avg/Sd	1.0510/0.0041	1.1149/0.2107

Mask#3 25DegC

Test	Condition	Limit	Unit	Stat	BD441 - NPN	
					QUAL LOT	CONTROL
Iebo	Veb=5V	<1.00E-03	Amp	Avg/Sd	3.27E-10/2.49E-10	2.86E-10/2.65E-10
Icbo	Vcb=80V	<1.00E-04	Amp	Avg/Sd	1.86E-09/3.96E-10	2.38E-09/3.09E-10
BVebo	IE= 100uA	>5	Volt	Avg/Sd	11.79/0.15	13.5/0.28
BVceo	IC=100mA	>80V	Volt	Avg/Sd	95.9/1.9	96.7/1.8
hFE	0.5A/1V	40 - 475		Avg/Sd	379.1/15.3	347.1/12.6
hFE	2A/1V	>15		Avg/Sd	117.5/5.6	109.7/3.7
hFE	10mA/5V	>15		Avg/Sd	453.9/40.0	516.3/47.0
VBE(on)	1A/2V	<1.1V	Volt	Avg/Sd	0.8338/0.0054	0.8377/0.0021
VCE(sat)	3A/0.3A	<0.8	Volt	Avg/Sd	0.2184/0.0083	0.2169/0.0031

Mask#4 25DegC

Test	Condition	Limit	Unit	Stat	BD682 - PNP	
					QUAL LOT	CONTROL
Iebo	Veb=5V	<2.00E-03	Amp	Avg/Sd	5.72E-04/1.65E-05	6.39E-04/1.14E-05
Iceo	Vce=50V	<5.00E-04	Amp	Avg/Sd	2.76E-09/2.85E-10	3.75E-09/5.00E-10
Icbo	Vcb=100V	<2.00E-04	Amp	Avg/Sd	4.55E-09/1.79E-09	5.35E-09/6.17E-10
BVceo	IC=50mA	>100V	Volt	Avg/Sd	173.8/7.5	161.9/4.6
hFE	1.5A/3V	>750		Avg/Sd	6146.2/438.1	4777.9/226.8
hFE	2A/3V	>750		Avg/Sd	4978.6/635.1	3694.5/296.3
VCE(sat)	1.5A/30mA	<2.5V	Volt	Avg/Sd	0.9339/0.0059	0.9688/0.0046
VBE(on)	1.5A/3V	<2.5	Volt	Avg/Sd	1.5160/0.0284	1.5023/0.0242

Mask#4 25DegC

Test	Condition	Limit	Unit	Stat	MJD112T4 - NPN	
					QUAL LOT	CONTROL
Iebo	Veb=5V	<2.00E-03	Amp	Avg/Sd	8.38E-04/3.02E-05	7.79E-04/1.27E-05
Iceo	Vce=50V	<2.00E-05	Amp	Avg/Sd	4.14E-09/3.87E-10	2.32E-09/3.41E-10
Icbo	Vcb=100V	<2.00E-05	Amp	Avg/Sd	5.62E-09/5.38E-10	3.13E-09/1.87E-10
BVceo	IC= 30mA	>100V	Volt	Avg/Sd	129.5/2.1	126.5/0.5
hFE	0.5A/3V	>500		Avg/Sd	3382.0/134.7	3773.5/98.5
hFE	2A/3V	1K to 12K		Avg/Sd	8608.3/474.2	8762.5/202.6
hFE	4A/3V	>200		Avg/Sd	4156.5/402.9	4555.3/166.7
VCE(sat)	2A/8mA	<2.0	Volt	Avg/Sd	0.913/0.005	0.938/0.002
VCE(sat)	4A/40mA	<3.0	Volt	Avg/Sd	1.109/0.010	1.144/0.004
VBE(sat)	4A/40mA	<4.0	Volt	Avg/Sd	1.863/0.010	1.862/0.004
VBE(on)	2A/3V	<2.8	Volt	Avg/Sd	1.538/0.005	1.540/0.003



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CHANGED PART IDENTIFICATION:

Product marked with date code 0425 might have new Die design.

AFFECTED DEVICE LIST (WITHOUT SPECIALS):

PART

2C3773WP
2N3772
2N3773
2N4918
2N4919
2N4920
2N5190
2N5191
2N5192
2N5631
2N6031
2N6034
2N6035
2N6036
2N6038
2N6039
BD180
BD234
BD238
BD435
BD437
BD437T
BD439
BD441
BD675
BD675A
BD676
BD676A
BD677
BD677A
BD678
BD678A
BD679
BD679A
BD680
BD680A
BD681
BD682
BD682T
MJ15001
MJ15002
MJD112
MJD112-001
MJD112RL
MJD112T4
MJD117
MJD117-001
MJD117T4
MJD148T4



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MJD32C
MJD32C1
MJD32CRL
MJD32CT4
MJD32RL
MJD32T4
MJD6039T4
MJE4353
MJE521
MJE700
MJE702
MJE703
MJE800
MJE802
MJE803
MJF122
MJF127
MJF32C
SJD112T4
SJD32C
SJD32C1
SJD32CRL
SJD32CT4
TIP110
TIP111
TIP112
TIP115
TIP116
TIP117
TIP120
TIP121
TIP122
TIP30
TIP30A
TIP30B
TIP30C
TIP32
TIP32A
TIP32B
TIP32C