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**FINAL PRODUCT/PROCESS CHANGE NOTIFICATION**  
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**18-FEB-2003**

**SUBJECT: ON Semiconductor Final Product/Process Change Notification #12616**

**TITLE: Backmetal Standardization for MMBZ27VALT1 and MMBZ33VALT1 Devices and VF Datasheet Consolidation for MMBZ5V6ALT1 Series**

**EFFECTIVE DATE: 19-Apr-2003**

**AFFECTED CHANGE CATEGORY: Wafer Process**

**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 your local ON Semiconductor Sales Office or Paul Lem <FFBFBM@onsemi.com>

**FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:**

Contact Sales Office or Paul Lem <FFBFBM@onsemi.com>

**DISCLAIMER:**

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 is the Final Notification to the Initial Notification #12616 that went out on November 14, 2002.

In a continuous improvement effort, ON Semiconductor is consolidating its backmetal scheme to improve manufacturability for the MMBZ27VALT1 and MMBZ33VALT1 devices. The current metal scheme used for MMBZ27VALT1 and MMBZ33VALT1 is a NiSix (Nickel Silicide) Au (Ni/Au Silicide). This metal scheme will be changed to an evaporated Au to standardize the device backmetal with all other SOT23 Dual and Single Zeners.

In addition, the current datasheet (that includes MMBZ27VALT1 and MMBZ33VALT1) will be consolidated to reflect a common VF specification. The VF specification for devices 6.8V to 33V will be consolidated to VF=0.9V max at IF=10mA.



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**RELIABILITY DATA SUMMARY:**

**MMBZ5221BLT1 (0644)**

<b>Test Description</b>	<b>Lot 1</b>	<b>Lot 2</b>	<b>Lot 3</b>	<b>Control</b>
HTRB - 1008 Hours TA=150C, VR=1.8V	0/84	0/84	0/84	0/84
H3TRB - 1008 Hours TA=85C, RH=85% VR=1.8V	0/84	0/84	0/84	0/84
ESD				
Human Body Model	Class 3	Class 3	Class 3	Class 3
Machine Model	Class C	Class C	Class C	Class C
IOL - 15000 Cycles TA=25C, delta TJ=100C, Ton = Toff = 2 min	0/84	0/84	0/84	0/84
Temp Cycle - 1000 Cycles -65C to 150C, Tdwell > 10min	0/84	0/84	0/84	0/84
AutoClave - 96 Hours Ta=121C, RH=100% P=15psig	0/84	0/84	0/84	0/84

**ELECTRICAL CHARACTERISTIC SUMMARY:**

**MMBZ27VALT1 Characterization Data Summary**

**DC Temperature Characterization**

**Temperature: 25C [J1 indicates 1st junction,J2 indicates 2nd junction]**

VF 48A Limit = 0.9V Max, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.800	0.800	0.798	0.799
Min:	0.792	0.793	0.793	0.794
Avg:	0.797	0.797	0.797	0.798
SDev:	0.002	0.002	0.001	0.001
Cpk:	17.305	17.659	33.675	33.350

VF 48A Limit = 1.1V Max, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.976	0.977	1.019	1.027
Min:	0.970	0.971	0.972	0.974
Avg:	0.973	0.974	0.998	0.999
SDev:	0.002	0.002	0.014	0.013
Cpk:	83.520	92.117	9.678	10.162

VZ 48A Limit = 28.35V Max, 25.65V Min, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	26.760	26.770	27.240	27.250
Min:	26.490	26.490	27.050	27.050
Avg:	26.595	26.603	27.153	27.159
SDev:	0.070	0.067	0.049	0.053
Cpk:	4.526	4.729	8.420	7.862



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IR 48A Limit = 0.05uA, VR=22V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	1.71E-09	5.73E-10	1.54E-09	8.35E-10
Min:	5.10E-12	8.00E-13	2.79E-11	4.70E-12
Avg:	3.59E-10	1.47E-10	4.06E-10	2.30E-10
SDev:	4.93E-10	1.86E-10	4.82E-10	2.47E-10
Cpk:	33.577	89.548	34.293	67.297

**Temperature:-55C[No Datasheet Specifications at temperatures other than 25C]**

VF, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.909	0.910	0.965	0.968
Min:	0.904	0.905	0.906	0.909
Avg:	0.906	0.907	0.927	0.929
SDev:	0.001	0.001	0.013	0.013

VF, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	1.086	1.090	1.481	1.492
Min:	1.057	1.059	1.081	1.106
Avg:	1.069	1.072	1.329	1.336
SDev:	0.009	0.009	0.103	0.091

VZ, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	24.950	24.960	25.390	25.400
Min:	24.730	24.740	25.230	25.230
Avg:	24.819	24.824	25.320	25.325
SDev:	0.053	0.052	0.045	0.048

IR , VR=22V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	2.84E-10	6.76E-11	9.98E-10	1.10E-10
Min:	2.69E-11	4.90E-12	6.69E-11	7.00E-13
Avg:	1.62E-10	3.33E-11	3.01E-10	5.06E-11
SDev:	6.25E-11	1.90E-11	1.84E-10	2.44E-11

**Temperature:150C[No Datasheet Specifications at temperatures other than 25C]**

VF, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.608	0.609	0.614	0.615
Min:	0.600	0.601	0.601	0.602
Avg:	0.604	0.605	0.608	0.609
SDev:	0.002	0.002	0.003	0.003

VF, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.839	0.842	0.840	0.838
Min:	0.834	0.835	0.832	0.829
Avg:	0.836	0.838	0.835	0.834
SDev:	0.002	0.002	0.002	0.002



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VZ, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	29.520	29.520	30.080	30.100
Min:	29.250	29.250	29.750	29.760
Avg:	29.362	29.372	29.929	29.934
SDev:	0.077	0.077	0.073	0.074

IR , VR=22V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	7.95E-09	7.66E-09	6.25E-09	5.81E-09
Min:	5.13E-09	5.48E-09	3.86E-09	3.85E-09
Avg:	6.57E-09	6.61E-09	4.89E-09	4.75E-09
SDev:	6.48E-10	5.84E-10	6.65E-10	4.74E-10

**MMBZ33VALT1 Characterization Data Summary**

**DC Temperature Characterization**

**Temperature: 25C [J1 indicates 1st junction,J2 indicates 2nd junction]**

VF 48A Limit = 0.9V Max, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.797	0.798	0.788	0.788
Min:	0.794	0.795	0.781	0.782
Avg:	0.795	0.797	0.785	0.786
SDev:	0.001	0.001	0.002	0.002
Cpk:	44.37	44.88	18.64	21.42

VF 48A Limit = 1.1V Max, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.992	0.995	1.179	1.172
Min:	0.981	0.984	1.005	1.008
Avg:	0.984	0.987	1.081	1.082
SDev:	0.003	0.003	0.055	0.044
Cpk:	11.93	12.01		

VZ 48A Limit = 31.35V Max, 34.65V Min, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	32.340	32.310	32.470	32.570
Min:	31.930	31.920	32.160	32.160
Avg:	32.146	32.122	32.303	32.318
SDev:	0.104	0.104	0.098	0.103
Cpk:	2.56	2.47	3.24	3.12

IR 48A Limit = 0.05uA, VR=26V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	2.79E-10	3.04E-10	1.61E-10	1.11E-10
Min:	1.45E-11	7.80E-12	6.39E-11	6.00E-13
Avg:	1.35E-10	7.76E-11	1.18E-10	5.41E-11
SDev:	4.33E-11	5.02E-11	2.67E-11	2.08E-11
Cpk:	383.91	331.35	623.17	798.71



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**Temperature:-55C[No Datasheet Specifications at temperatures other than 25C]**

VF, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.910	0.912	1.074	1.076
Min:	0.907	0.909	0.938	0.944
Avg:	0.909	0.910	0.997	1.001
SDev:	0.001	0.001	0.037	0.036

VF, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	1.167	1.160	1.769	1.750
Min:	1.074	1.075	1.482	1.522
Avg:	1.108	1.112	1.643	1.647
SDev:	0.025	0.025	0.082	0.068

VZ, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	30.070	30.060	29.960	29.980
Min:	29.670	29.660	29.660	29.690
Avg:	29.880	29.857	29.790	29.803
SDev:	0.101	0.103	0.085	0.087

IR , VR=22V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	3.15E-10	9.58E-11	3.00E-10	1.11E-10
Min:	1.70E-11	4.00E-12	5.30E-12	9.00E-13
Avg:	1.66E-10	4.64E-11	1.40E-10	3.24E-11
SDev:	8.51E-11	2.23E-11	8.30E-11	2.43E-11

**Temperature:150C[No Datasheet Specifications at temperatures other than 25C]**

VF, IF=10mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.611	0.612	0.613	0.614
Min:	0.599	0.600	0.601	0.602
Avg:	0.605	0.607	0.607	0.609
SDev:	0.004	0.004	0.003	0.003

VF, IF=200mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	0.859	0.861	0.857	0.859
Min:	0.849	0.851	0.844	0.845
Avg:	0.854	0.856	0.851	0.853
SDev:	0.003	0.002	0.004	0.004

VZ, IT=1.0mA (V)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	35.740	35.720	35.580	35.680
Min:	35.220	35.200	35.210	35.160
Avg:	35.508	35.482	35.369	35.382
SDev:	0.116	0.116	0.113	0.123

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IR , VR=22V (A)

	Control-J1	Control-J2	Eng-J1	Eng-J2
Max:	1.12E-08	1.11E-08	7.80E-09	7.21E-09
Min:	6.48E-09	6.32E-09	4.55E-09	4.71E-09
Avg:	8.39E-09	8.43E-09	5.99E-09	5.96E-09
SDev:	1.42E-09	1.32E-09	7.08E-10	6.71E-10

**CHANGED PART IDENTIFICATION:**

Package dimensions will remain unchanged.

Product reflecting this change will have the following marking:

MMBZ27VALT1 devices - Device Marking: 27A Date Code: 3

MMBZ33VALT1 devices - Device Marking: 33A Date Code: 3

**AFFECTED DEVICE LIST (WITHOUT SPECIALS):****PART**

MMBZ12VALT1  
MMBZ15VALT1  
MMBZ15VALT3  
MMBZ18VALT1  
MMBZ20VALT1  
MMBZ20VALT3  
MMBZ27VALT1  
MMBZ33VALT1  
MMBZ33VALT3  
MMBZ6V8ALT1  
MMBZ6V8ALT3  
MMBZ9V1ALT1  
MMBZ9V1ALT3  
SZMMBZ12VALT1  
SZMMBZ15VALT1  
SZMMBZ15VALT3  
SZMMBZ18VALT1  
SZMMBZ20VALT1  
SZMMBZ20VALT3  
SZMMBZ27VALT1  
SZMMBZ33VALT1  
SZMMBZ33VALT3  
SZMMBZ6V8ALT1  
SZMMBZ6V8ALT3  
SZMMBZ9V1ALT1  
SZMMBZ9V1ALT3