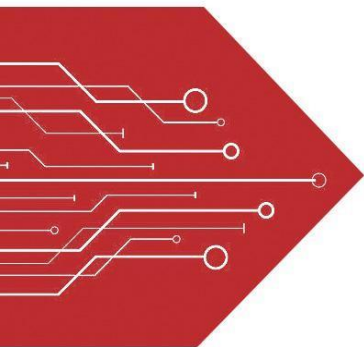


# MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV



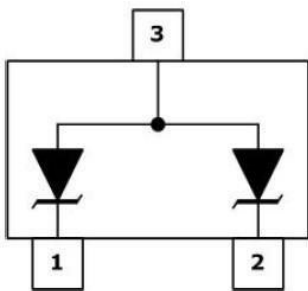
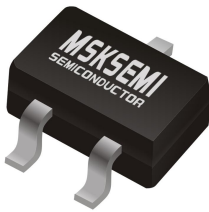
GDT



PLED

Product data sheet

## PIN CONFIGURATION



SOT-23

## FEATURES

- SOT-23 package allows either two separate unidirectional configurations or a single bidirectional configuration.
- Working peak reverse voltage 3V to 22V
- Standard Zener breakdown voltage 5.6V to 27V
- Peak power 24 or 40 Watts @ 1.0ms (unidirectional) per Figure 6 Waveform
- ESD Rating:
  - Class 3B (>16kV) per the Human Body Model
  - Class C (>400V) per Machine Model
- ESD Rating of IEC61000-4-2 level 4,  $\pm 30$ kV contact Discharge
- Low leakage < 5.0 $\mu$ A

## MACHANICAL DATA

- SOT-23 package
- Flammability Rating: UL 94V-0
- Packaging: Tape and Reel
- High temperature soldering guaranteed: 260°C/10s
- Reel size: 7 inch

## APPLICATIONS

- Computers
- Printers
- Business Machines
- Communication systems
- Medical equipment

**ABSOLUTE MAXIMUM RATING**

Symbol	Parameter	Value	Units
P <sub>PK</sub>	Peak Power Dissipation @1.0ms		
	MMBZ5V6AL-MS thru MMBZ9V1AL-MS	24	W
	MMBZ12VAL-MS thru MMBZ27VAL-MS	40	
P <sub>D</sub>	Total Power Dissipation	200	mW
T <sub>OPT</sub>	Operating Temperature	-55/+150	°C
T <sub>STG</sub>	Storage Temperature	-55/+150	°C

**24 WATTS**
**ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C)**
**UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 to 3)**

P/N	Marking	V <sub>RWM</sub>	I <sub>R</sub>	V <sub>BR</sub>			Z <sub>ZT</sub>	Z <sub>ZK</sub>		V <sub>C</sub>		
		(V)	(μA)	(V)			(mA)	(Ω)	(Ω)	(mA)	(V)	(A)
			@ V <sub>RWM</sub>	Min	Nom	Max	@ I <sub>T</sub>	Max @I <sub>ZT</sub>	Max	@ I <sub>ZK</sub>	Max	@ I <sub>PP</sub>
MMBZ5V6ALT1G-MS	5A6+code	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0
MMBZ6V2ALT1G-MS	6A2+code	3.0	0.5	5.89	6.2	6.51	1.0	--	--	--	8.7	2.76
MMBZ6V8ALT1G-MS	6A8+code	4.5	0.5	6.46	6.8	7.14	1.0	--	--	--	9.6	2.5
MMBZ9V1ALT1G-MS	9A1+code	6.0	0.3	8.65	9.1	9.56	1.0	--	--	--	14	1.7

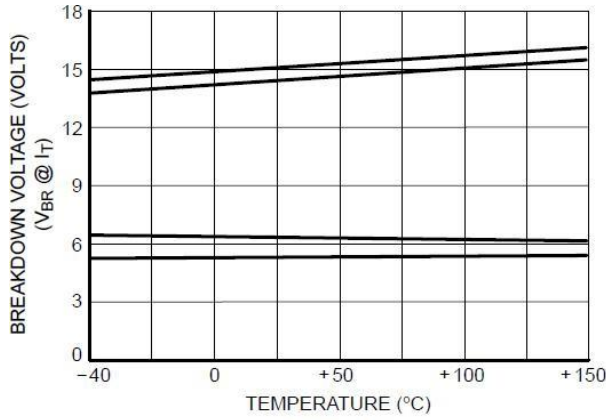
 V<sub>F</sub>=0.9V Max @ I<sub>F</sub>=10mA

**40 WATTS**
**ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C)**
**UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 to 3)**

P/N	Marking	V <sub>RWM</sub>	I <sub>R</sub>	V <sub>BR</sub>				V <sub>C</sub> (note1)	
		(V)	(nA)	(V)			(mA)	(V)	(A)
			@ V <sub>RWM</sub>	Min	Nom	Max	@ I <sub>T</sub>	Max	@ I <sub>PP</sub>
MMBZ12VALT1G-MS	12A+code	8.5	200	11.40	12	12.60	1	17	2.35
MMBZ15VALT1G-MS	15A+code	12.0	50	14.25	15	15.75	1	21	1.90
MMBZ18VALT1G-MS	18A+code	14.5	50	17.10	18	18.90	1	25	1.60
MMBZ20VALT1G-MS	20A+code	16.0	50	19	20	21	1	38	1.0
MMBZ27VALT1G-MS	27A+code	22.0	50	25.65	27	28.35	1	40	1.0

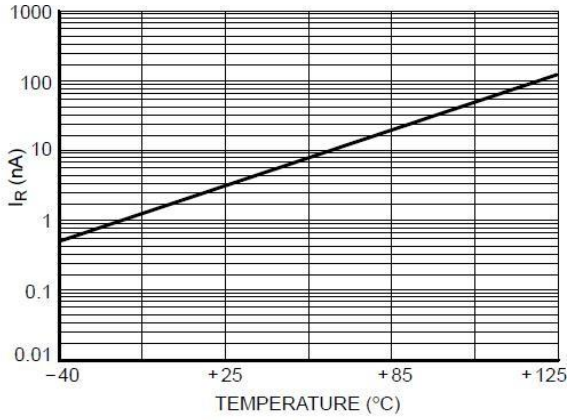
 V<sub>F</sub>=0.9V Max @ I<sub>F</sub>=10mA

Note 1: Surge Current waveform per Figure 5

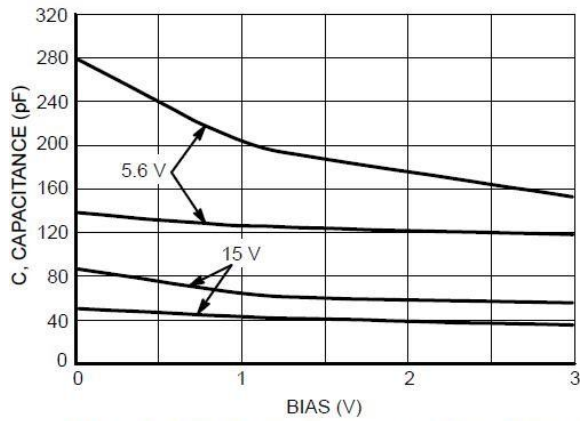


**Figure 1. Typical Breakdown Voltage versus Temperature**

(Upper curve for each voltage is bidirectional mode, lower curve is unidirectional mode)

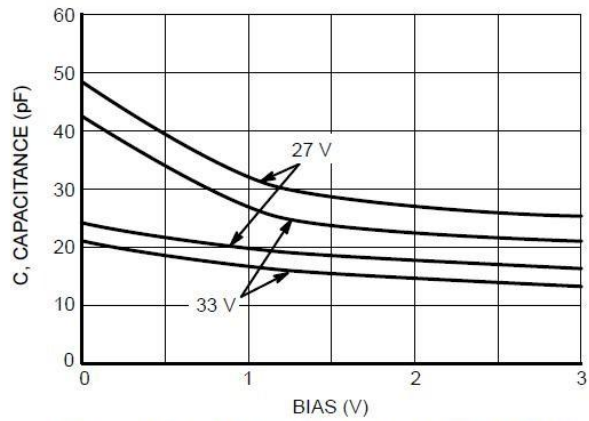


**Figure 2. Typical Leakage Current versus Temperature**



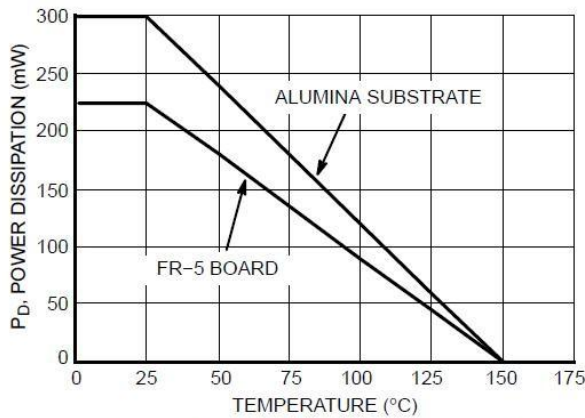
**Figure 3. Typical Capacitance versus Bias Voltage**

(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)



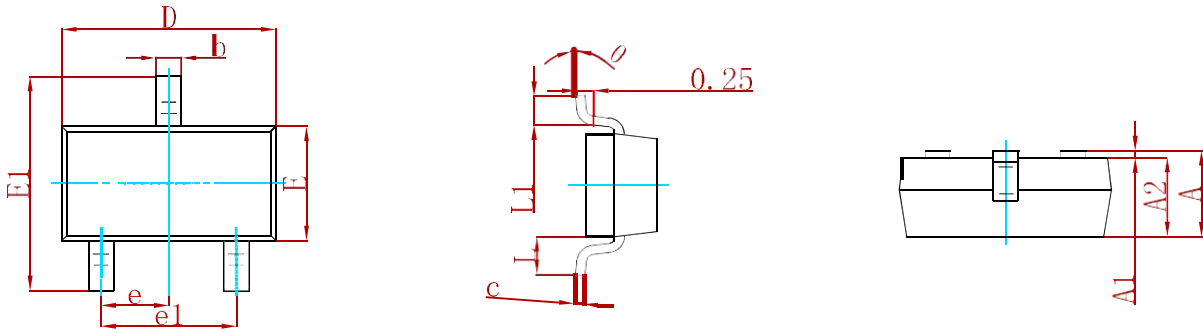
**Figure 4. Typical Capacitance versus Bias Voltage**

(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)



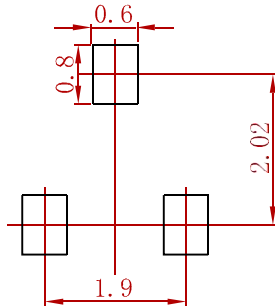
**Figure 5. Steady State Power Derating Curve**

**PACKAGE MECHANICAL DATA**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

**Suggested Pad Layout**



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance: ± 0.05mm.
  3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

P/N	PKG	QTY
MMBZXXXALT1G-MS	SOT-23	3000

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