

OM SENI

MMBZxxxALT1G Series 24 and 40 Watt Peak Power Zener Transient Voltage Suppressors

SOT-23 Dual Common Anode Zeners for ESD Protection

These dual monolithic silicon Zener diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. Their dual junction common anode design protects two separate lines using only one package. These devices are ideal for situations where board space is at a premium.

Features

- SOT-23 Package Allows Either Two Separate Unidirectional Configurations or a Single Bidirectional Configuration
- Working Peak Reverse Voltage Range – 3 V to 26 V
- Standard Zener Breakdown Voltage Range – 5.6 V to 47 V
- Peak Power – 24 or 40 W @ 1.0 ms (Unidirectional), per Figure 6 Waveform
- ESD Rating:
 - Class 3B (> 16 kV) per the Human Body Model
 - Class C (> 400 V) per the Machine Model
- ESD Rating of IEC61000-4-2 Level 4, ± 30 kV Contact Discharge
- Maximum Clamping Voltage @ Peak Pulse Current
- Low Leakage < 5.0 μ A
- These Devices are Pb-Free and are RoHS Compliant

Mechanical Characteristics

CASE: Void-free, transfer-molded, thermosetting plastic case

FINISH: Corrosion resistant finish, easily solderable

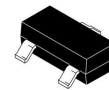
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

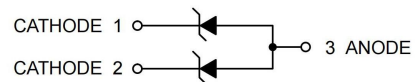
Package designed for optimal automated board assembly

Small package size for high density applications

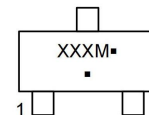
Available in 8 mm Tape and Reel



SOT-23



MARKING DIAGRAM



XXX = Specific Device Code

M = Date Code

■ = Pb-Free Package

(Note: Microdot may be in either location)

MAXIMUM RATINGS

2

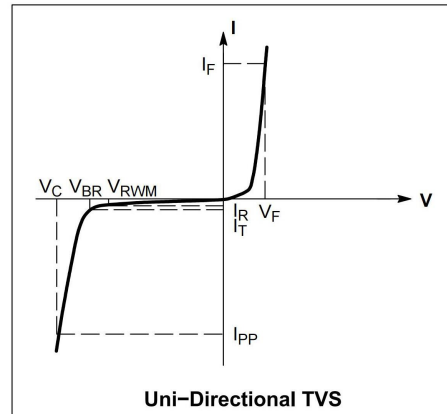
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ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)**UNIDIRECTIONAL** (Circuit tied to Pins 1 and 3 or 2 and 3)

Symbol	Parameter
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}
V _{RWM}	Working Peak Reverse Voltage
I _R	Maximum Reverse Leakage Current @ V _{RWM}
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
θV _{BR}	Maximum Temperature Coefficient of V _{BR}
I _F	Forward Current
V _F	Forward Voltage @ I _F
Z _{ZT}	Maximum Zener Impedance @ I _{ZT}
I _{ZK}	Reverse Current
Z _{ZK}	Maximum Zener Impedance @ I _{ZK}



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 and 3)(V_F = 0.9 V Max @ I_F = 10 mA) (5% Tolerance)**24 WATTS**

Device*	Device Marking	V _{RWM} Volts	I _R @ V _{RWM} μA	Breakdown Voltage				Max Zener Impedance (Note 5)			V _C @ I _{PP} (Note 6)		θV _{BR} mV/°C
				V _{BR} (Note 4) (V)			@ I _T	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	V _C	I _{PP}		
				Min	Nom	Max	mA	Ω	Ω	mA	V	A	
MMBZ5V6ALT1G	5A6	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0	1.26
MMBZ6V2ALT1G	6A2	3.0	0.5	5.89	6.2	6.51	1.0	–	–	–	8.7	2.76	2.80
MMBZ6V8ALT1G	6A8	4.5	0.5	6.46	6.8	7.14	1.0	–	–	–	9.6	2.5	3.4
MMBZ9V1ALT1G	9A1	6.0	0.3	8.65	9.1	9.56	1.0	–	–	–	14	1.7	7.5

(V_F = 0.9 V Max @ I_F = 10 mA) (5% Tolerance)**40 WATTS**

Device*	Device Marking	V _{RWM} Volts	I _R @ V _{RWM} nA	Breakdown Voltage				V _C @ I _{PP} (Note 6)		θV _{BR} mV/°C
				V _{BR} (Note 4) (V)			@ I _T	V _C	I _{PP}	
				Min	Nom	Max	mA	V	A	
MMBZ12VALT1G	12A	8.5	200	11.40	12	12.60	1.0	17	2.35	7.5
MMBZ15VALT1G	15A	12	50	14.25	15	15.75	1.0	21	1.9	12.3
MMBZ16VALT1G	16A	13	50	15.20	16	16.80	1.0	23	1.7	13.8
MMBZ18VALT1G	18A	14.5	50	17.10	18	18.90	1.0	25	1.6	15.3
MMBZ20VALT1G	20A	17	50	19.00	20	21.00	1.0	28	1.4	17.2
MMBZ27VALT1G	27A	22	50	25.65	27	28.35	1.0	40	1.0	24.3
MMBZ33VALT1G	33A	26	50	31.35	33	34.65	1.0	46	0.87	30.4
MMBZ47VALT1G	47A	38	50	44.65	47	49.35	1.0	54	0.74	43.1

(V_F = 0.9 V Max @ I_F = 10 mA) (2% Tolerance)**40 WATTS**

Device*	Device Marking	V _{RWM} Volts	I _R @ V _{RWM} nA	Breakdown Voltage			V _C @ I _{PP} (Note 6)		θV _{BR} mV/°C	
				V _{BR} (Note 4) (V)			@ I _T	V _C		I _{PP}
				Min	Nom	Max	mA	V		A
MMBZ16VTALT1G	16T	13	50	15.68	16	16.32	1.0	23	1.7	13.8
MMBZ47VTALT1G	47T	38	50	46.06	47	47.94	1.0	54	0.74	43.1

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TYPICAL CHARACTERISTICS

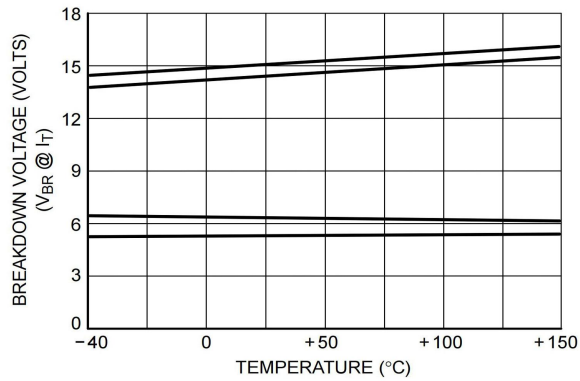


Figure 1. Typical Breakdown Voltage versus Temperature

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

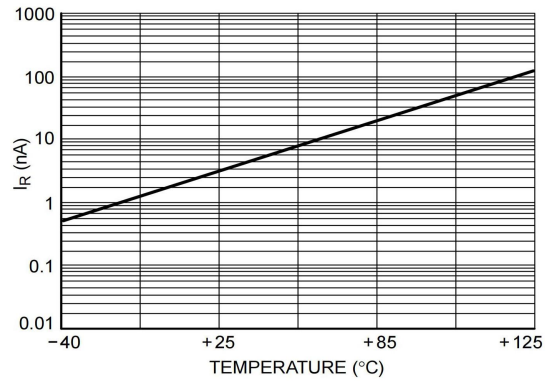


Figure 2. Typical Leakage Current versus Temperature

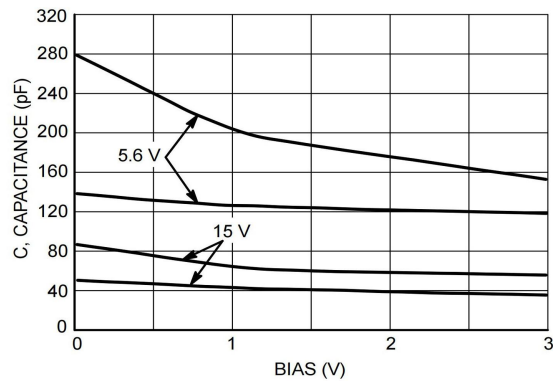


Figure 3. Typical Capacitance versus Bias Voltage

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

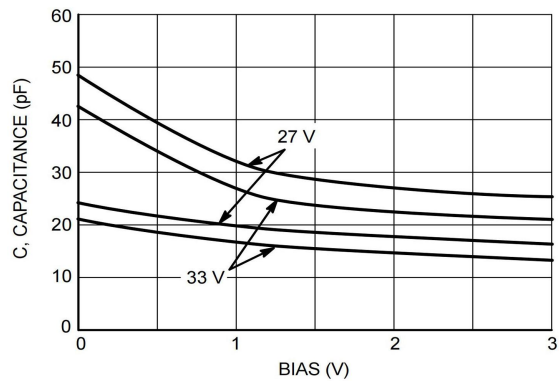


Figure 4. Typical Capacitance versus Bias Voltage

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

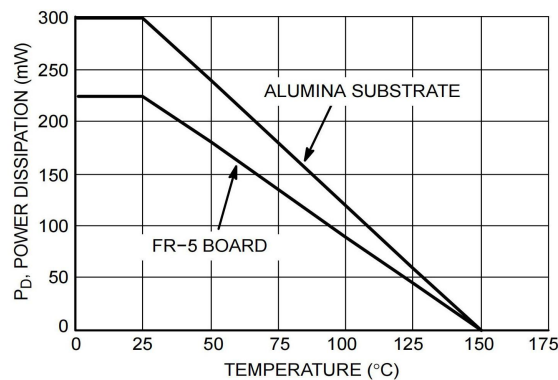


Figure 5. Steady State Power Derating Curve

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TYPICAL CHARACTERISTICS

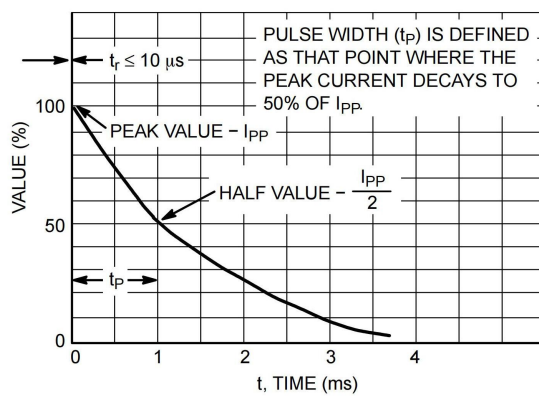


Figure 6. Pulse Waveform

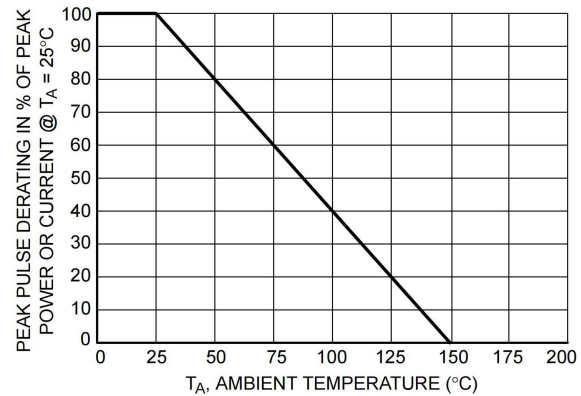


Figure 7. Pulse Derating Curve

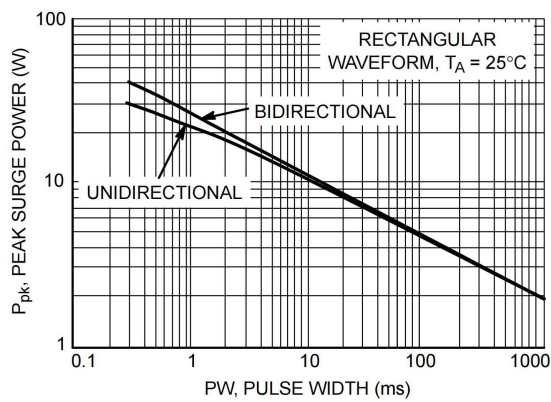


Figure 8. Maximum Non-repetitive Surge Power, P_{pk} versus PW

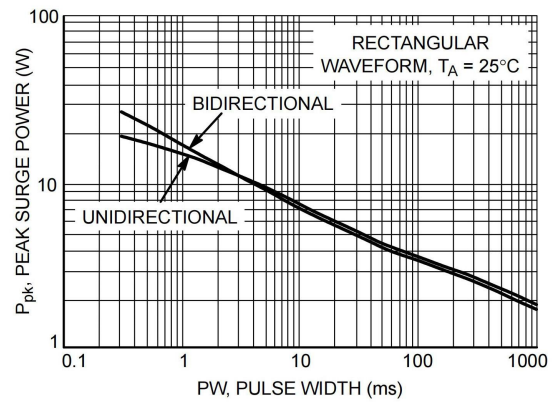


Figure 9. Maximum Non-repetitive Surge Power, $P_{pk(NOM)}$ versus PW

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Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7"

Package Outline Dimensions (SOT-23)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077