MMBZxxxAL Series

Common Anode Zeners for ESD Protection

DESCRIPTION

The 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 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 2V to 26V
- ✧Standard Zener breakdown voltage 5.1V to 33V
- ✧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
- ✧Low leakage < 5.0μA

MACHANICAL DATA

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

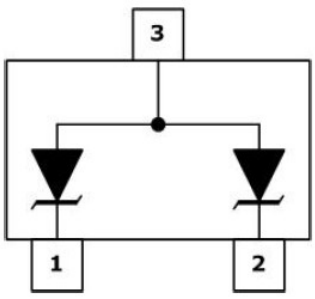
ORDERING INFORMATION

- ✧Device: MMBZxxxAL Series
- ✧Package: SOT-23
- ✧Material: RoHS Compliant
- ✧Packing: Tape & Reel
- ✧Quantity per reel: 3,000pcs

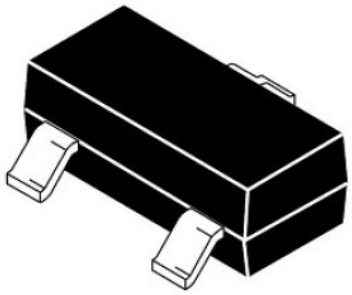
APPLICATIONS

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

PIN CONFIGURATION



PACKAGE OUTLINE



MMBZxxxAL Series

Common Anode Zeners for ESD Protection

ABSOLUTE MAXIMUM RATING			
Symbol	**Parameter**	**Value**	**Units**
P_{PK}	Peak Power Dissipation @1.0ms MMBZ5V1AL thru MMBZ9V1AL MMBZ12VAL thru MMBZ33VAL	 24 40	W
P_D	Total Power Dissipation	200	Mw
T_{OPT}	Operating Temperature	-55/+150	°C
T_{STG}	Storage Temperature	-55/+150	°C

24 WATTS

ELECTRICAL CHARACTERISTICS (Tamb=25°C)
UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 to 3)

Part Number	Device Marking	V_{RWM}	I_R	V_{BR}				Z_{ZT}	Z_{ZK}		V_C	
		(V)	(μA)	(V)			(mA)	(Ω)	(Ω)	(ma)	(V)	(A)
			@ V_{RWM}	Min	Nom	Max	@ I_T	Max @I_{ZT}	Max	@ I_{ZK}	Max	@ I_{PP}
MMBZ5V1AL	5A1+code	2.0	5.0	4.8	5.1	5.4	5.0	60	500	1.0	13	2
MMBZ5V6AL	5A6+code	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0
MMBZ6V2AL	6A2+code	3.0	0.5	5.89	6.2	6.51	1.0	--	--	--	8.7	2.76
MMBZ6V8AL	6A8+code	4.5	0.5	6.46	6.8	7.14	1.0	--	--	--	9.6	2.5
MMBZ9V1AL	9A1+code	6.0	0.3	8.65	9.1	9.56	1.0	--	--	--	14	1.7

V_F=0.9V Max @ I_F=10Ma

40 WATTS

ELECTRICAL CHARACTERISTICS (Tamb=25°C)
UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 to 3)

Part Number	Device Marking	V_{RWM}	I_R	V_{BR}				V_C (note1)	
		(V)	(nA)	(V)			(mA)	(V)	(A)
			@ V_{RWM}	Min	Nom	Max	@ I_T	Max	@ I_{PP}
MMBZ12VAL	12A+code	8.5	200	11.40	12	12.60	1	17	2.35
MMBZ15VAL	15A+code	12.0	50	14.25	15	15.75	1	21	1.90
MMBZ18VAL	18A+code	14.5	50	17.10	18	18.90	1	25	1.60
MMBZ20VAL	20A+code	16.0	50	19	20	21	1	38	1.0
MMBZ27VAL	27A+code	22.0	50	25.65	27	28.35	1	40	1.0
MMBZ33VAL	33A+code	26.0	50	31.35	33	34.65	1	46	0.87

V_F=0.9V Max @ I_F=10mA

Note 1: Surge Current waveform per Figure 5

ELECTRICAL CHARACTERISTICS CURVE

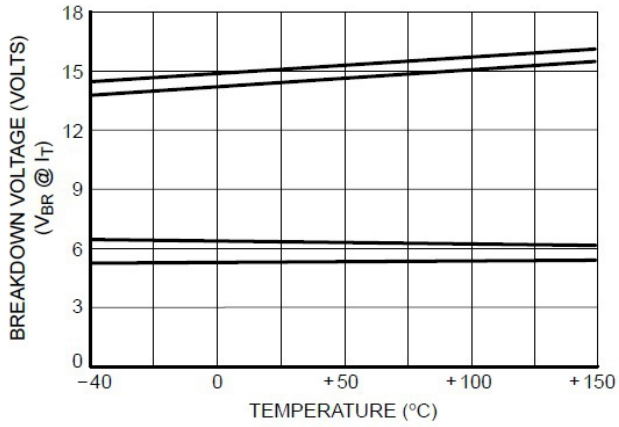


Figure 1. Typical Breakdown Voltage versus Temperature
(Upper curve for each voltage is bidirectional mode, lower curve is unidirectional mode)

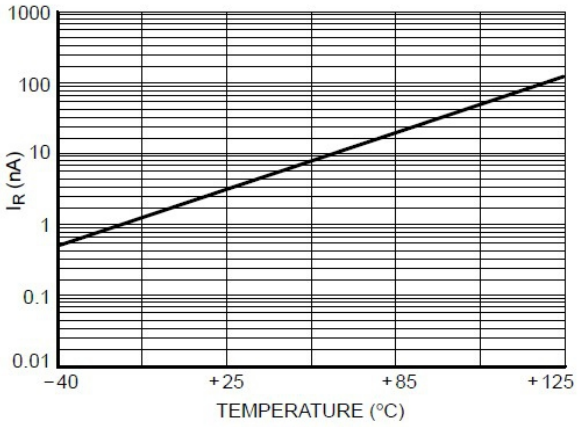


Figure 2. Typical Leakage Current versus Temperature

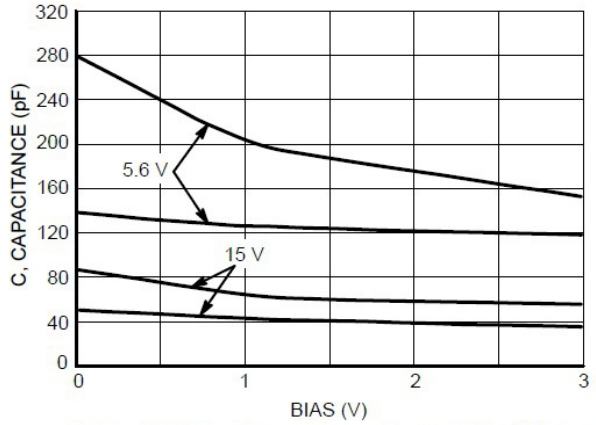


Figure 3. Typical Capacitance versus Bias Voltage
(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)

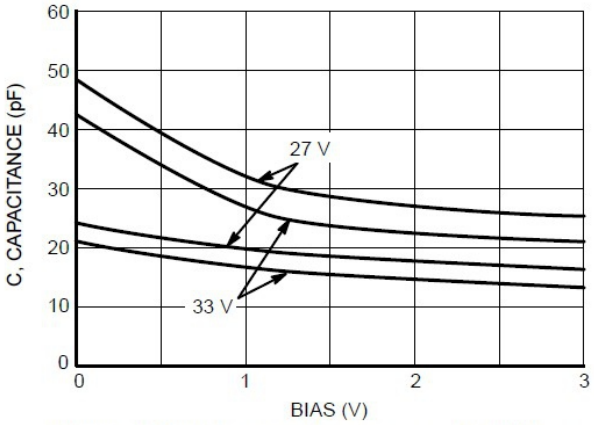


Figure 4. Typical Capacitance versus Bias Voltage
(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)

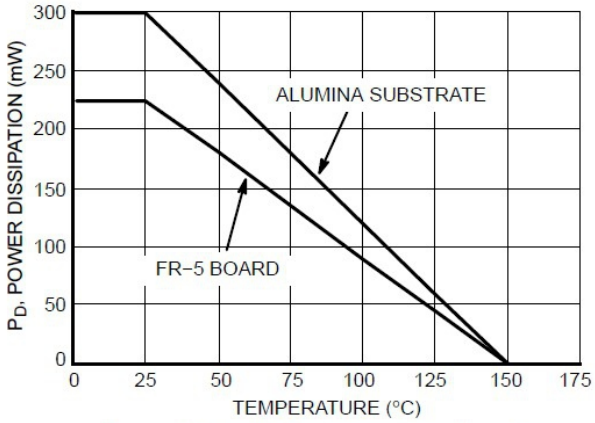


Figure 5. Steady State Power Derating Curve

ELECTRICAL CHARACTERISTICS CURVE

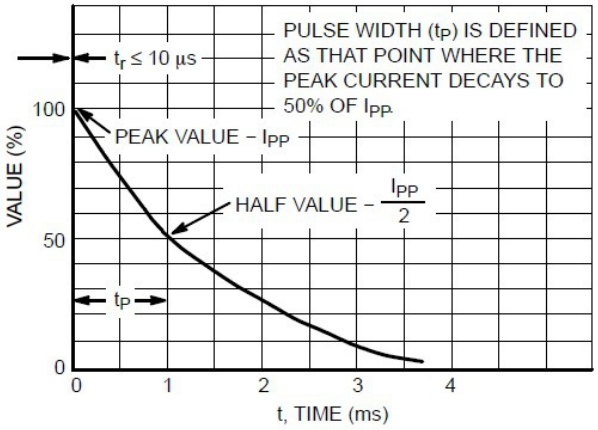


Figure 6. Pulse Waveform

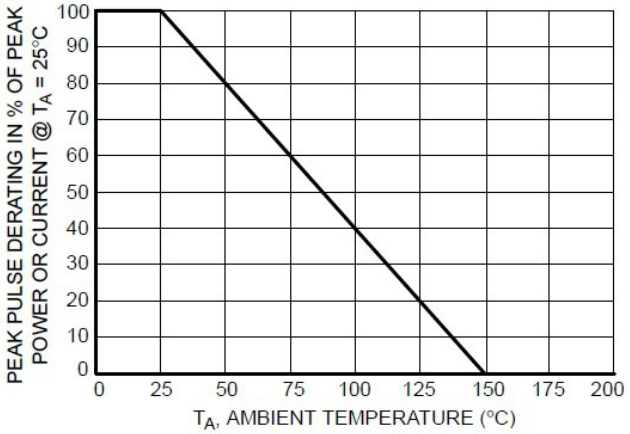


Figure 7. Pulse Derating Curve

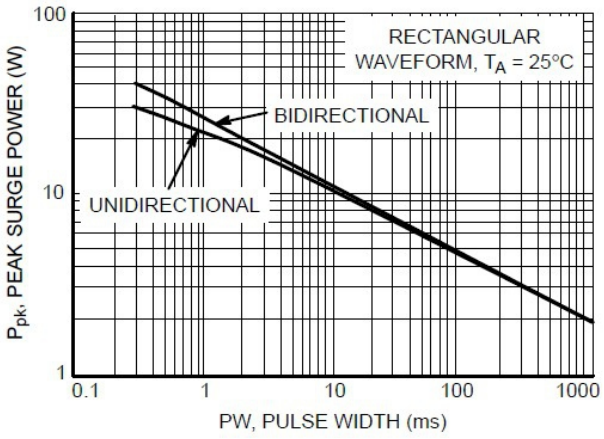


Figure 8. Maximum Non−repetitive Surge Power, P_{pk} versus PW

Power is defined as V_{RSM} x I_Z(pk) where V_{RSM} is the clamping voltage at I_Z(pk).

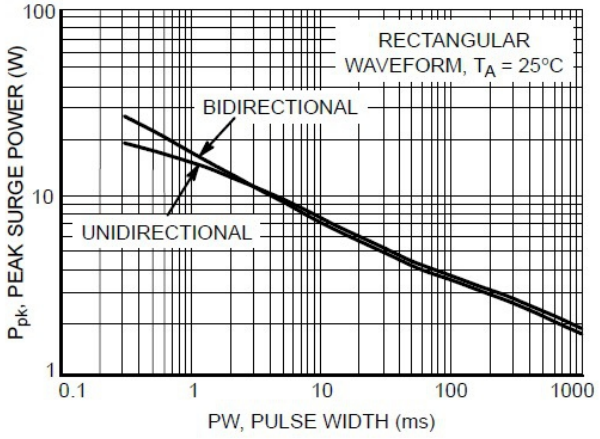
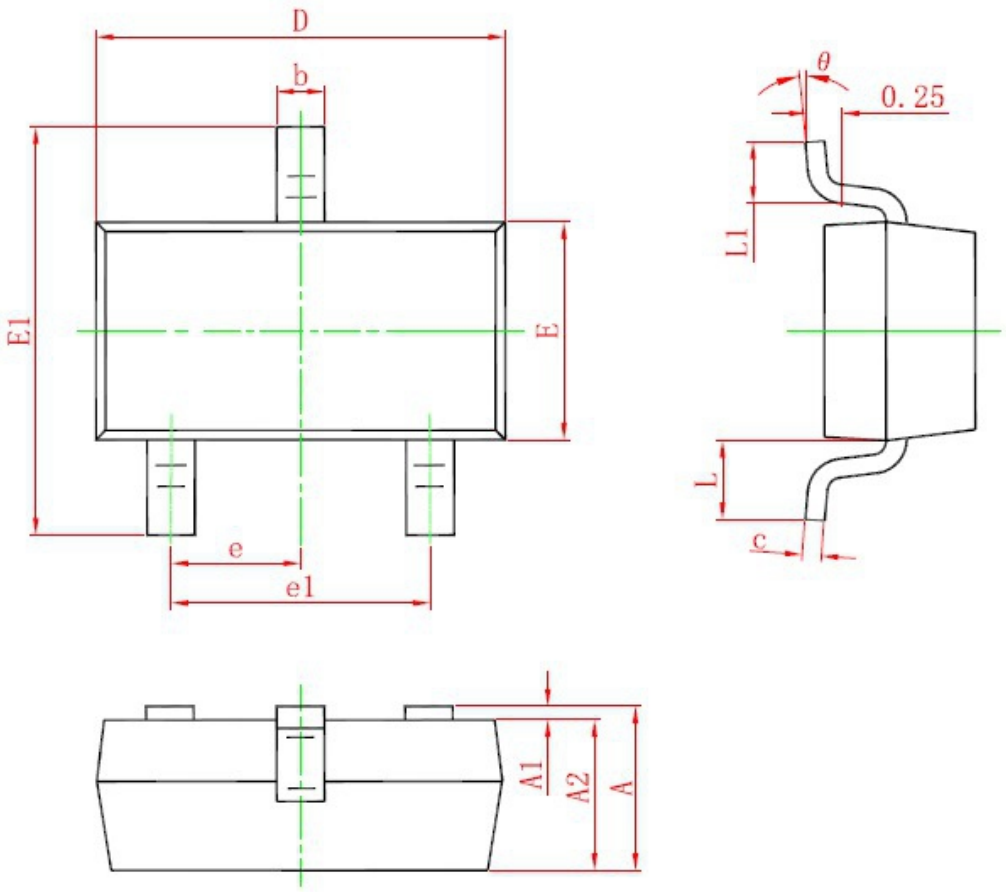


Figure 9. Maximum Non−repetitive Surge Power, P_{pk}(NOM) versus PW

Power is defined as V_Z(NOM) x I_Z(pk) where V_Z(NOM) is the nominal Zener voltage measured at the low test current used for voltage classification.

SOT-23 PACKAGE OUTLINE DIMENSIONS



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°