DESCRIPTION

The MMBZ5V6A~ MMBZ33VA are available in SOT-23 Package

ORDERING INFORMATION

Package Type	Part Number
SOT-23	MMBZ5V6A
	MMBZ6V2A
	MMBZ6V8A
	MMBZ9V1A
	MMBZ10VA
	MMBZ12VA
	MMBZ15VA
	MMBZ18VA
	MMBZ20VA
	MMBZ27VA
	MMBZ33VA
Note	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

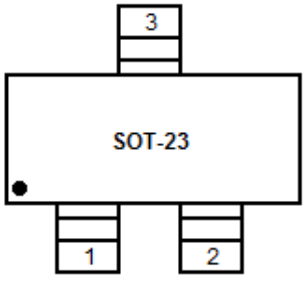
FEATURES

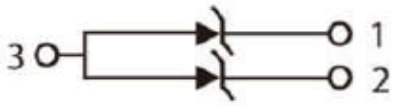
- Allows Either Two Separate Unidirectional Configurations or a Single Bidirectional Configurations.
- Low Leakage Current.
- 24-40 Watts Peak Power Protection.
- Excellent Clamping Capability.
- ESD Rating of Class N(exceeding 16kV)per the Human Body Model.
- Available in SOT-23 Package

MECHANICAL DATA

- Case: Molded Epoxy
- Marking: Marking Code
- Maximum Case Temperature for Soldering Purpose: 260°C for 10sec.
- Weight: 0.008grams(approx.)

PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

T_A= 25°C, unless otherwise noted

P_{PK}, Peak Power Dissipation @ 1.0 ms @ T_L≤25°C[NOTE1]	
MMBZ5V6A ~ MMBZ10VA	24W
MMBZ12VA ~ MMBZ33VA	40W
P_D, Total Power Dissipation on FR-5 Board[NOTE2] @ T_A=25°C	225mW
Derate above 25°C	1.8mW/°C
$R_{\theta JA}$, Thermal Resistance Junction-to-Ambient	556°C/W
P_D, Total Power Dissipation on Alumina Substrate[NOTE3]@T_A=25°C	300mW
Derate above 25°C	2.4mW/°C
$R_{\theta JA}$, Thermal Resistance Junction-to-Ambient	417°C/W
T_J, T_{STG}, Junction and Storage Temperature Range	-55°C ~+150°C
T_L, Lead Solder Temperature-Maximum(10 second Duration)	260°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these o r any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Non-Repetitive Current Pulse per FIG 5 and Derated above T_A =25°C per FIG 6.

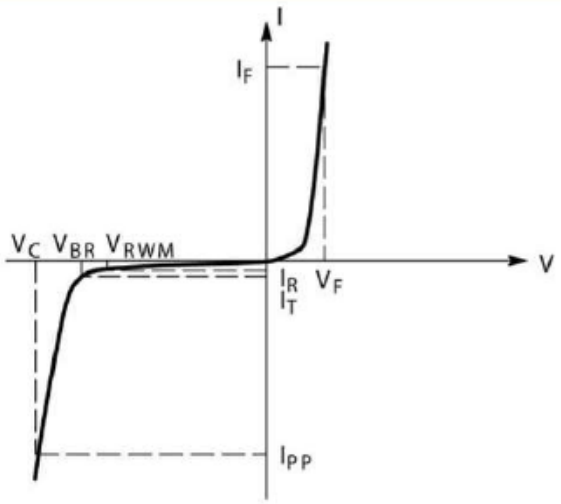
NOTE2: FR-5=1.0 x0.75 x0.62 in.

NOTE3: Alumina=0.4 x0.3 x0.024m 99.5% alumina

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 and 3)



Uni-Directional TVS

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}
θV_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
V_{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}

24 WATTS V_F=0.9V Max @ I_F=10mA

Device	V_{RWM}	I_R@ V_{RWM}	Breakdown Voltage				Max Zener Impedance NOTE5			V_C @ I_{PP} NOTE6		θV_{BR}
			V_{BR} NOTE4 (V)			@ I_T	Z_{ZT} @ I_{ZT}	Z_{ZK}@ I_{ZK}		V_C	I_{PP}	
	Volts	μA	Min	Nom	Max	mA	Ω	Ω	mA	V	A	mV/°C
MMBZ5V6A	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0	1.26
MMBZ6V2A	3.0	0.5	5.89	6.2	6.51	1.0	-	-	-	8.7	2.76	2.80
MMBZ6V8A	4.5	0.5	6.46	6.8	7.14	1.0	-	-	-	9.6	2.5	3.4
MMBZ9V1A	6.0	0.3	8.65	9.1	9.56	1.0	-	-	-	14	1.7	7.5
MMBZ10VA	6.5	0.3	9.50	10	10.5	1.0	-	-	-	14.2	1.7	7.5

40 WATTS V_F=0.9V Max @ I_F=10mA

Device	V_{RWM}	I_R @ V_{RWM}	Breakdown Voltage				V_C @ I_{PP} NOTE6		θV_{BR}
			V_{BR} NOTE4 (V)			@ I_T	V_C	I_{PP}	
	Volts	nA	Min	Nom	Max	mA	V	A	mV /°C
MMBZ12VA	8.5	200	11.40	12	12.60	1.0	17	2.35	7.5
MMBZ15VA	12	50	14.25	15	15.75	1.0	21	1.9	12.3
MMBZ18VA	14.5	50	17.10	18	18.90	1.0	25	1.6	15.3
MMBZ20VA	17	50	19.00	20	21.00	1.0	28	1.4	17.2
MMBZ27VA	22	50	25.65	27	28.35	1.0	40	1.0	24.3
MMBZ33VA	26	50	31.35	33	34.65	1.0	46	0.87	30.4

NOTE4: V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C

NOTE5: Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)}$= 0.1 $I_{Z(DC)}$. with the AC frequency = 1.0 kHz

NOTE6: Surge current waveform per Fig 5 and derate per Fig 6

TYPICAL CHARACTERISTICS

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

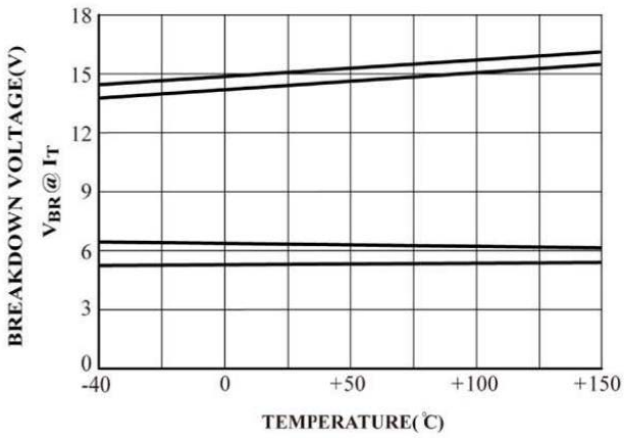


Figure 2. Typical Leakage Current vs. Temperature

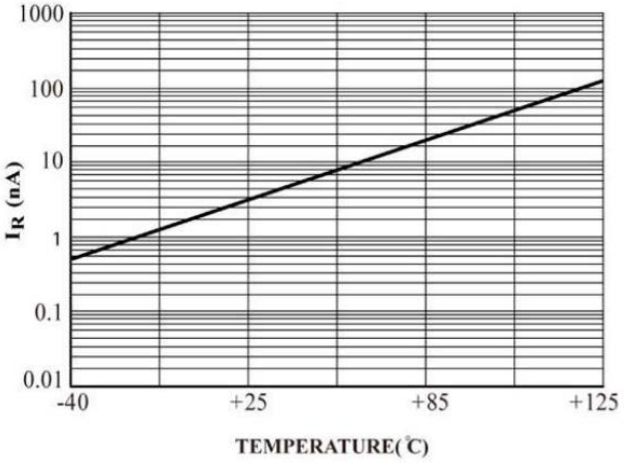


Figure 3. Typical Capacitance vs. Bias Voltage
(Upper curve for each voltage is bidirectional mode, lower curve is unidirectional mode)

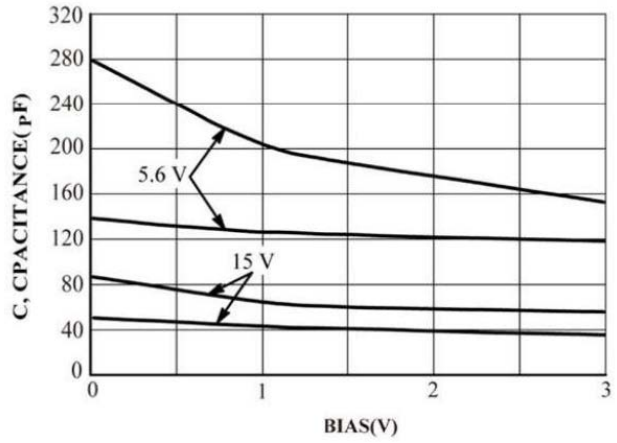


Figure 4. Steady State Power Derating Curve

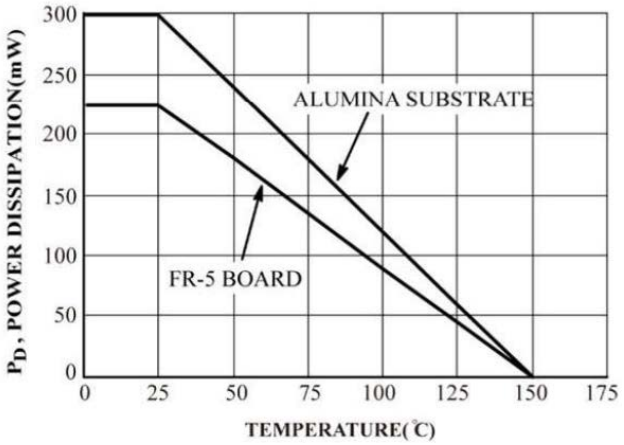


Figure 5. Pulse Waveform

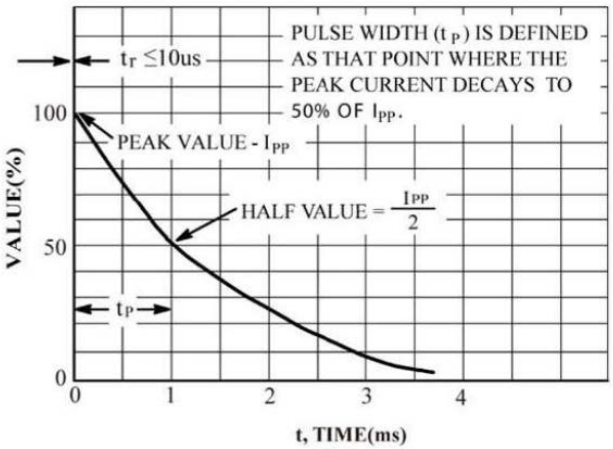


Figure 6. Pulse Derating Curve

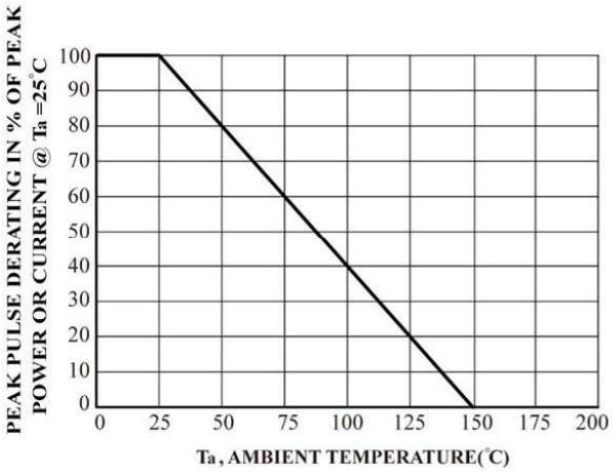


Figure 7. Maximum Non-repetitive Surge Power, P_{PK} vs. PW

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

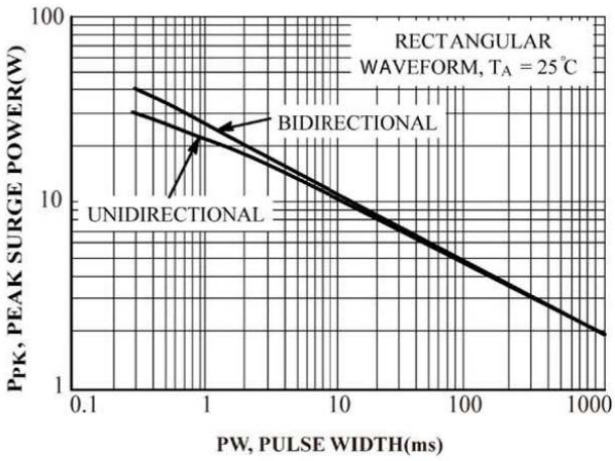
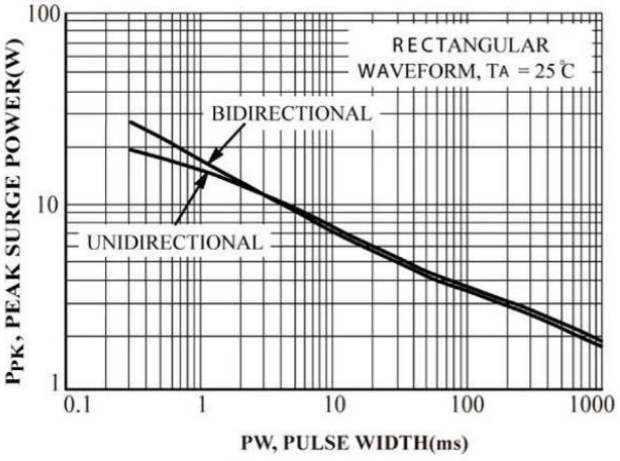


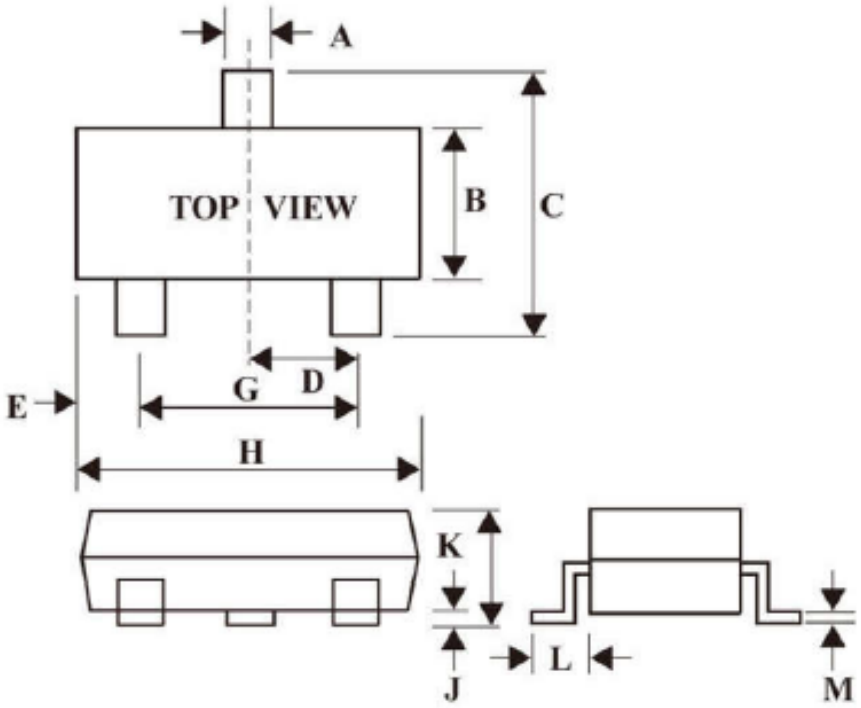
Figure 8. Maximum Non-repetitive Surge Power, $P_{PK(NOM)}$ vs. PW

(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.)



PACKAGE INFORMATION

Dimension in SOT-23 (Unit: mm)



DIM	MIN	MAX
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25

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