

MMBZ5V1D THUR MMBZ33VD

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.

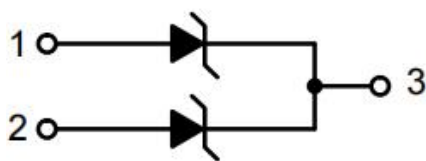
Ordering Information

- Device:MMBZxxxD Series
- Package:SOT-23
- Material:RoHS compliant
- Packing:Tape & Reel
- Quantity per reel:3000pcs

Applications

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

Pin Configuration



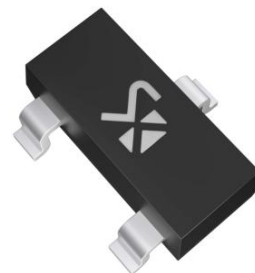
Features

- 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 40W @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 < 1.0μA

Mechanical Data

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

Package Outline





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Absolute Maximum Rating

Parameter		Symbol	Value	Units
Peak Power Dissipation @1.0ms	MMBZ5V1D~MMBZ9V1D	P_{PK}	24	W
	MMBZ12VD~MMBZ33VD		40	
Forward Voltage@ $I_F=10mA$		V_F	0.9	V
Total Power Dissipation		P_D	200	mW
Operating Temperature		T_{OPT}	-55~+150	°C
Storage Temperature		T_{STG}	-55~+150	°C

24W Electrical Characteristics ⁽¹⁾($T_A=25^{\circ}C$)

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}
MMBZ5V1D	5D1	2.0	5.0	4.8	5.1	5.4	5.0	60	500	1.0	13	2
MMBZ5V6D	5D6	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0
MMBZ6V2D	6D2	3.0	0.5	5.89	6.2	6.51	1.0	-	-	-	8.7	2.76
MMBZ6V8D	6D8	4.5	0.5	6.46	6.8	7.14	1.0	-	-	-	9.6	2.5
MMBZ9V1D	9D1	6.0	0.3	8.65	9.1	9.56	1.0	-	-	-	14	1.7

40W Electrical Characteristics ⁽¹⁾ ($T_A=25^{\circ}C$)

Part Number	Device Marking	V_{RWM}	I_R	V_{BR}				$V_C^{(2)}$	
		(V)	(nA)	(V)			(mA)	(V)	(A)
			@ V_{RWM}	Min	Nom	Max	@ I_T	Max	@ I_{PP}
MMBZ12VD	12D	8.5	200	11.40	12	12.60	1	17	2.35
MMBZ15VD	15D	12.0	50	14.25	15	15.75	1	21	1.90
MMBZ18VD	18D	14.5	50	17.10	18	18.90	1	25	1.60
MMBZ20VD	20D	16.0	50	19	20	21	1	38	1.0
MMBZ27VD	27D	22.0	50	25.65	27	28.35	1	40	1.0
MMBZ33VD	33D	26.0	50	31.35	33	34.65	1	46	0.87

Note:(1)Unidirectional (Circuit tied to Pins 1 to 3 or Pins 2 to 3)

(2). Surge Current waveform per Figure 5



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Electrical Characteristics Curve

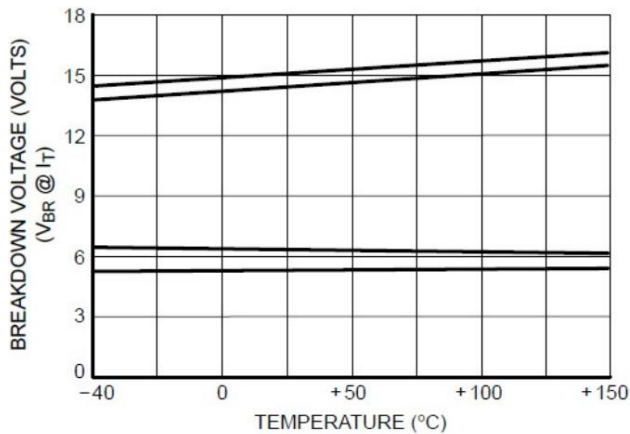


Figure 1. Typical Breakdown Voltage versus Temperature

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

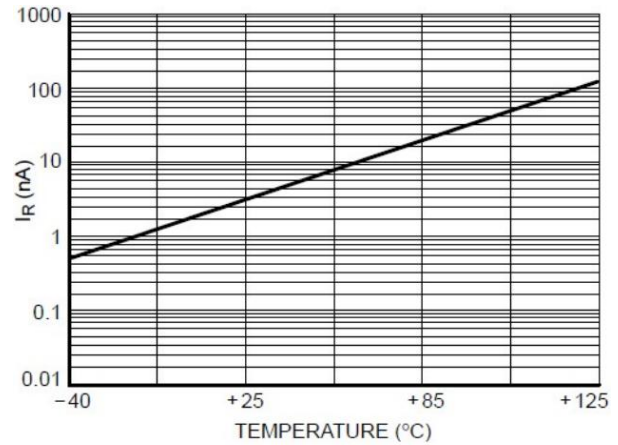


Figure 2. Typical Leakage Current versus Temperature

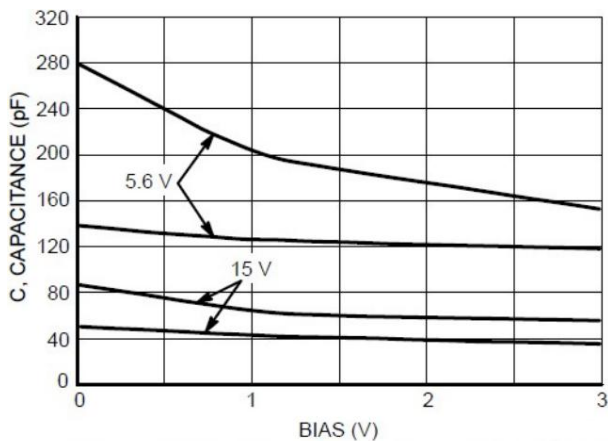


Figure 3. Typical Capacitance versus Bias Voltage

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

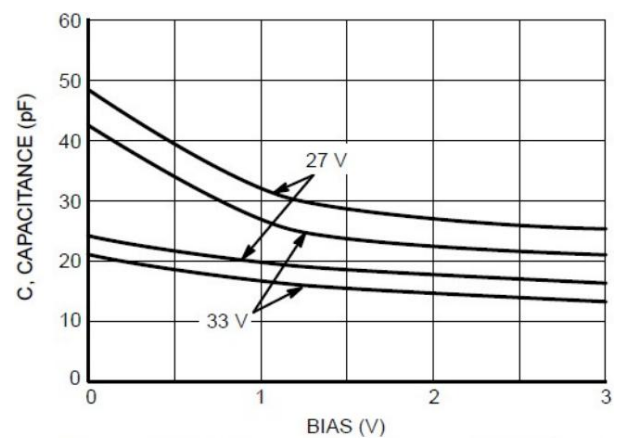


Figure 4. Typical Capacitance versus Bias Voltage

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

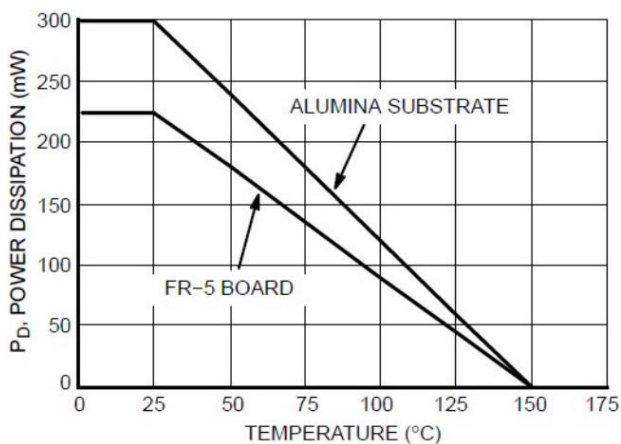


Figure 5. Steady State Power Derating Curve



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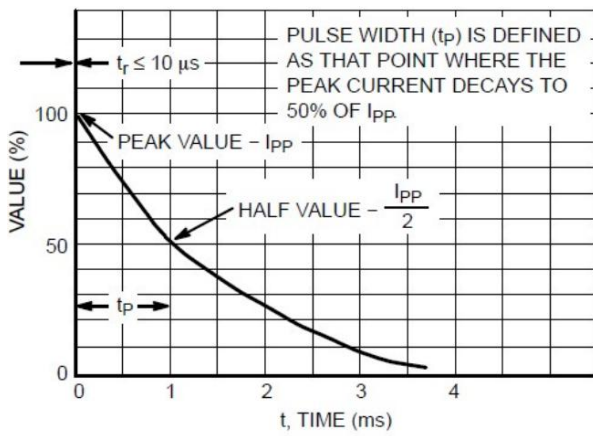


Figure 6. Pulse Waveform

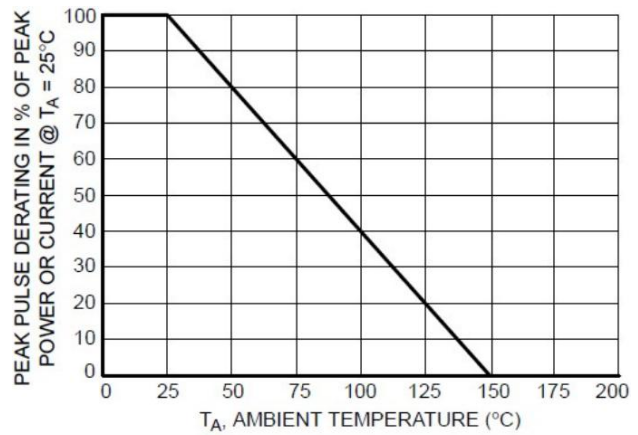


Figure 7. Pulse Derating Curve

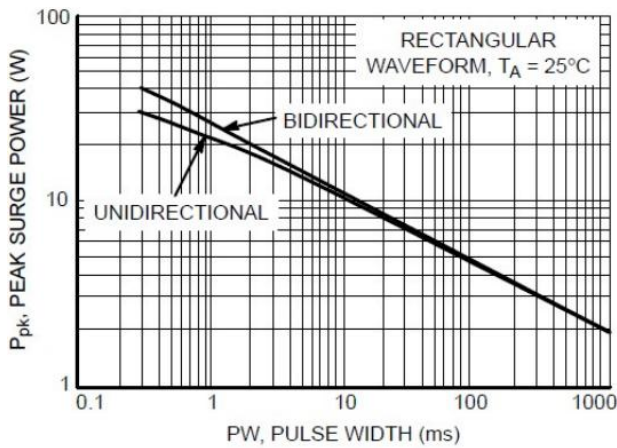


Figure 8. Maximum Non-repetitive Surge Power, P_{pk} versus PW

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

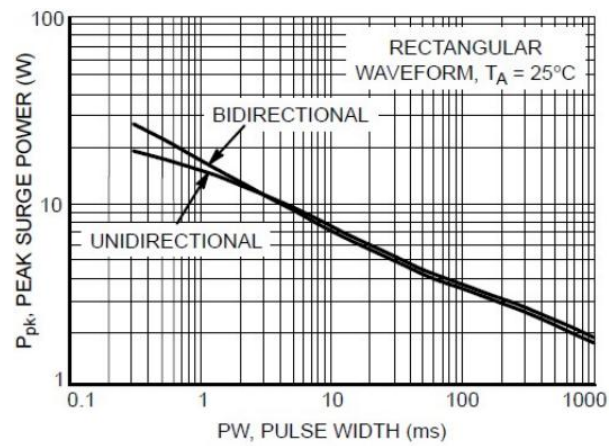


Figure 9. Maximum Non-repetitive Surge Power, $P_{pk}(NOM)$ versus PW

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

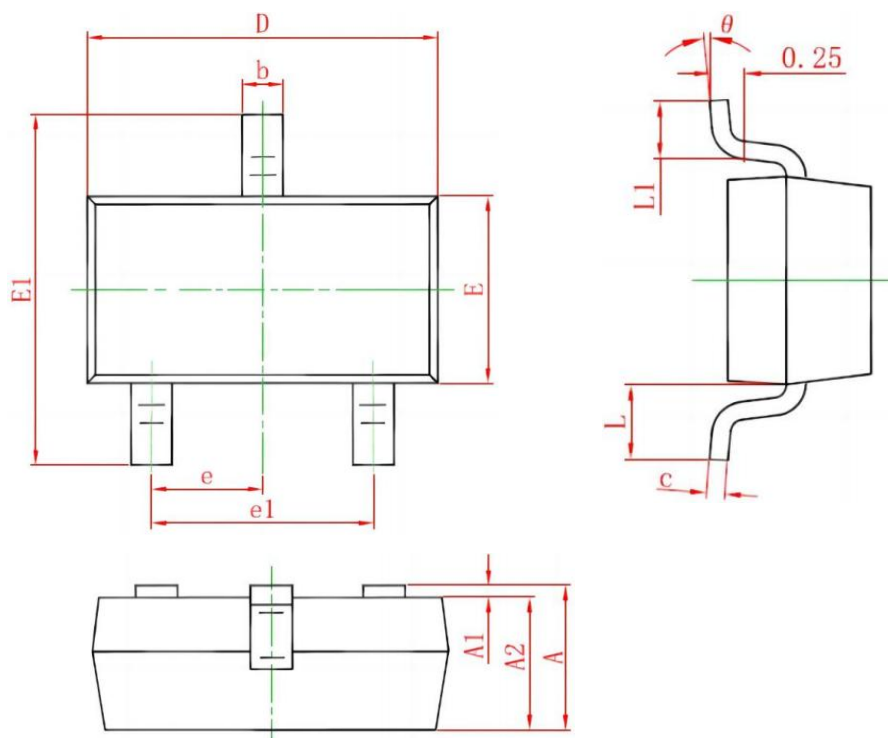


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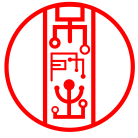
Package Information

SOT-23

Dimensions in mm



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	0.500 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



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