

1. 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.

3. 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

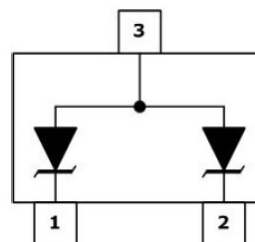
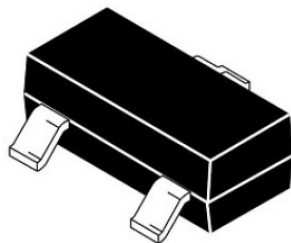
2. Features

- 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
- 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

4. Applications

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

5. Pinning Information



SOT-23



6. Absolute Maximum Rating

Parameter		Symbol	Value	Units
Peak Power Dissipation	MMBZ5V1AL thru MMBZ9V1AL	P_{PK}	24	W
	MMBZ12VAL thru MMBZ33VAL		40	W
Total Power Dissipation		P_D	200	mW
Operating Temperature		T_{OPT}	-55 to 150	°C
Storage Temperature		T_{STG}	-55 to 150	°C

7.1 Electrical Characteristics ($T_{amb}=25^{\circ}\text{C}$) (24 WATTS)

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

$V_F=0.9\text{V Max @ } I_F=10\text{mA}$



7.2 Electrical Characteristics (Tamb=25°C) (40 WATTS)

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 @ $I_F=10mA$



8. Typical Characteristic

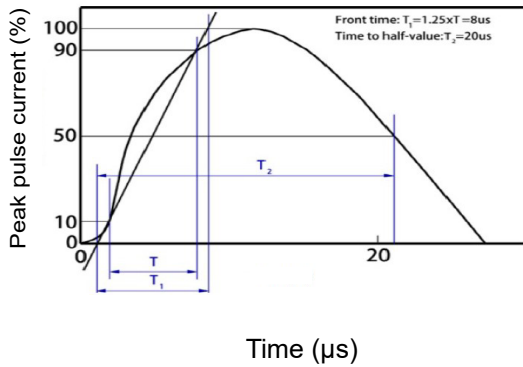


Figure 1: 8/20μs Waveform per IEC61000-4-5

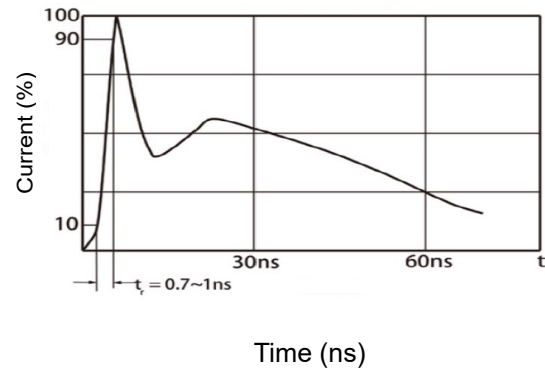


Figure 2: Contact Discharge Current Waveform per IEC 61000-4-2

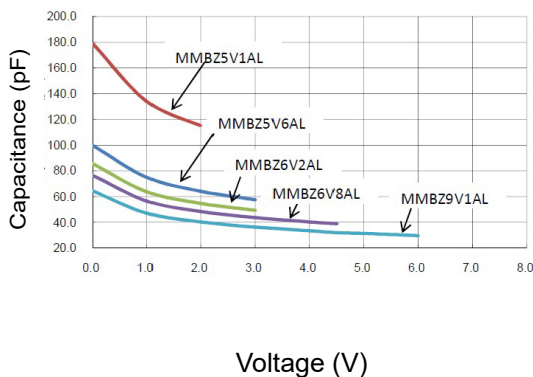


Figure 3: Voltage vs Capacitance

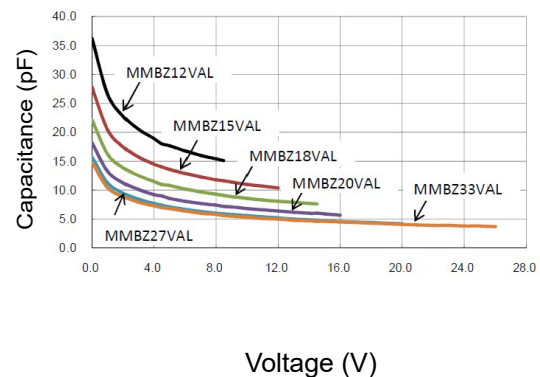


Figure 4: Voltage vs Capacitance

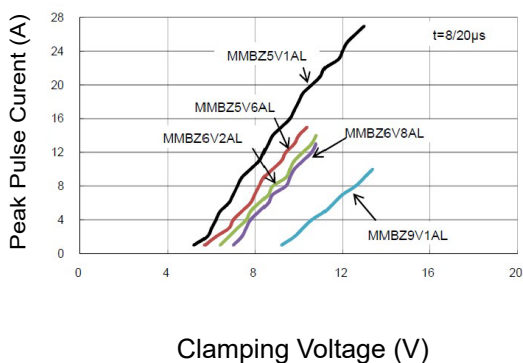


Figure 5: Clamping Voltage vs Peak Pulse Current

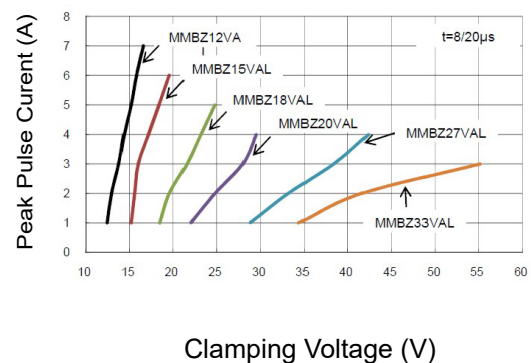
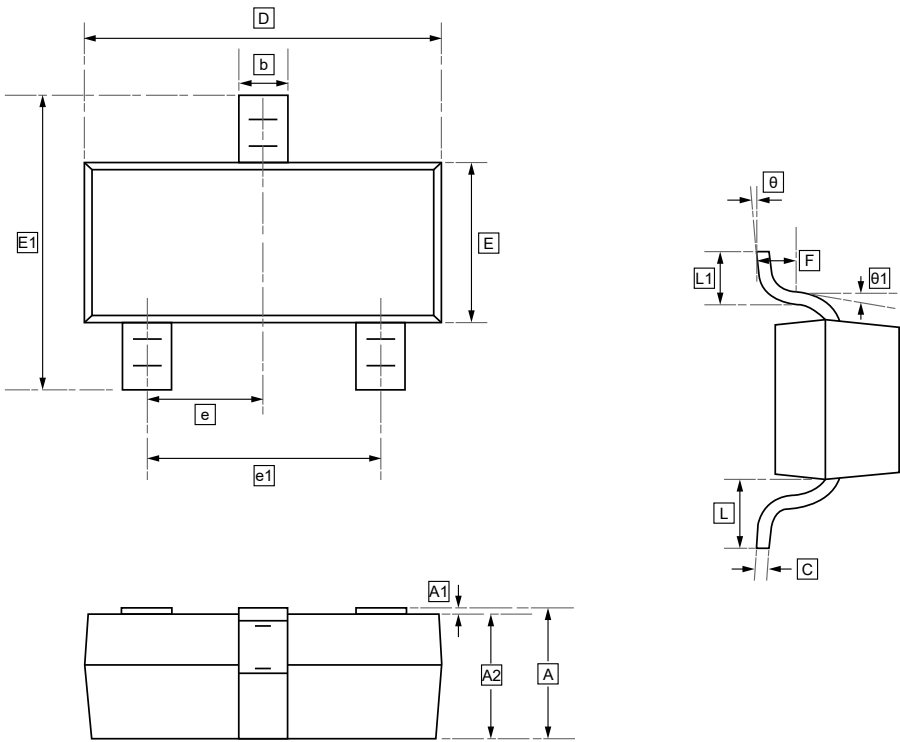


Figure 6: Clamping Voltage vs Peak Pulse Current



9.SOT-23 Package Outline Dimensions



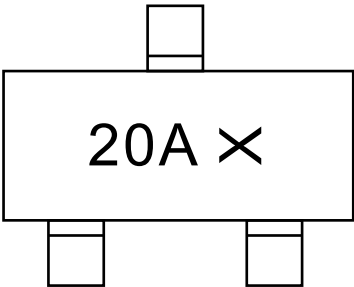
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°



10.Ordering Information



Order Code	Marking	Package	Base QTY	Delivery Mode
UMW MMBZ5V1AL	5A1	SOT-23	3000	Tape and reel
UMW MMBZ5V6AL	5A6	SOT-23	3000	Tape and reel
UMW MMBZ6V2AL	6A2	SOT-23	3000	Tape and reel
UMW MMBZ6V8AL	6A8	SOT-23	3000	Tape and reel
UMW MMBZ9V1AL	9A1	SOT-23	3000	Tape and reel
UMW MMBZ12VAL	12A	SOT-23	3000	Tape and reel
UMW MMBZ15VAL	15A	SOT-23	3000	Tape and reel
UMW MMBZ18VAL	18A	SOT-23	3000	Tape and reel
UMW MMBZ20VAL	20A	SOT-23	3000	Tape and reel
UMW MMBZ27VAL	27A	SOT-23	3000	Tape and reel
UMW MMBZ33VAL	33A	SOT-23	3000	Tape and reel



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