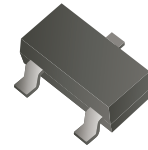


MMBZ5V1AL-HF Thru. MMBZ33VAL-HF

RoHS Device
Halogen Free

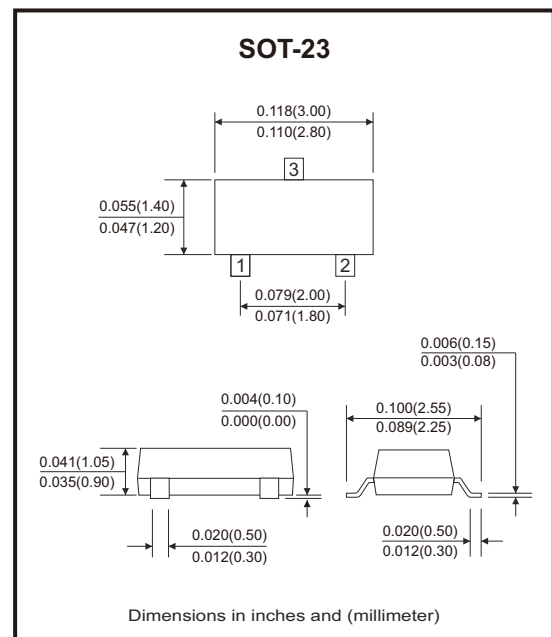


Features

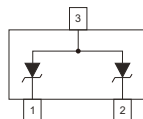
- Working peak reverse voltage 2V to 26V.
- Standard zener breakdown voltage 5.1V to 33V.
- ESD Rating:
 Class 3B (>16kV) per the human body model (HBM)
 Class C (>400V) per the machine model (MM)
- ESD Rating of IEC 61000-4-2 level 4.
- Low leakage < 5 μ A.

Mechanical data

- Case: SOT-23 package.
- Flammability rating: UL 94V-0.
- High temperature soldering guaranteed: 260°C/10s.



Circuit Diagram



Maximum Rating (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (air)	ESD	±15	kV
ESD per IEC 61000-4-2 (contact)		±8	
Peak power dissipation	P _{PP}	See next table	W
Peak pulse current	I _{PP}	See next table	A
Total power dissipation	P _D	200	mW
Operating temperature range	T _J	-55 to +150	°C
Storage temperature range	T _{STG}	-55 to +150	°C

Electrical Characteristics (at Ta=25°C unless otherwise noted)

Unidirectional (circuit tied to Pin 1 and 3 or Pins 2 to 3)

Part No.	V _{RWM}	I _R	Breakdown voltage V _{BR} (V)				Max. V _F @I _F =10mA	Max. clamping voltage		Typ. capacitance @V _R =0V,1MHz	P _{PP}
	(V)	(μA)	Min	Nom	Max	I _T (mA)	(V)	V _C (V)	I _{PP} (A)	C _J (pF)	(W)
MMBZ5V1AL-HF	2	5	4.8	5.1	5.4	5	0.9	13	2	117	26
MMBZ5V6AL-HF	3	5	5.32	5.6	5.88	20	0.9	8	3	99	24
MMBZ6V2AL-HF	3	0.5	5.89	6.2	6.51	1	0.9	8.7	2.76	85	24
MMBZ6V8AL-HF	4.5	0.5	6.46	6.8	7.14	1	0.9	9.6	2.5	76	24
MMBZ9V1AL-HF	6	0.3	8.65	9.1	9.56	1	0.9	14	1.7	64	24

Unidirectional (circuit tied to Pin 1 and 3 or Pins 2 to 3)

Part No.	V _{RWM}	I _R	Breakdown voltage V _{BR} (V)				Max. V _F @I _F =10mA	Max. clamping voltage (Note 1)		Typ. capacitance @V _R =0V,1MHz	P _{PP}
	(V)	(nA)	Min	Nom	Max	I _T (mA)	(V)	V _C (V)	I _{PP} (A)	C _J (pF)	(W)
MMBZ12VAL-HF	8.5	200	11.4	12	12.6	1	0.9	17	2.35	36	40
MMBZ15VAL-HF	12	50	14.25	15	15.75	1	0.9	21	1.9	28	40
MMBZ18VAL-HF	14.5	50	17.10	18	18.90	1	0.9	25	1.6	24	40
MMBZ20VAL-HF	16	50	19	20	21	1	0.9	38	1	17	38
MMBZ27VAL-HF	22	50	25.65	27	28.35	1	0.9	40	1	16	40
MMBZ33VAL-HF	26	50	31.35	33	34.65	1	0.9	46	0.87	13	40

Notes: 1. Surge current waveform per Fig.5 .

Typical Rating and Characteristic Curves (MMBZxxxAL-HF Series)

Fig.1 - Typical Breakdown Voltage vs Temperature

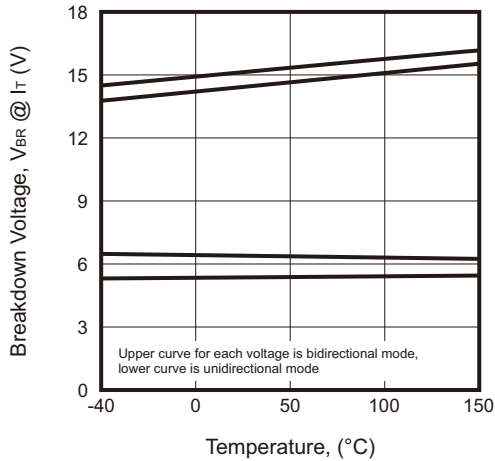


Fig.2 - Typical Leakage Current vs Temperature

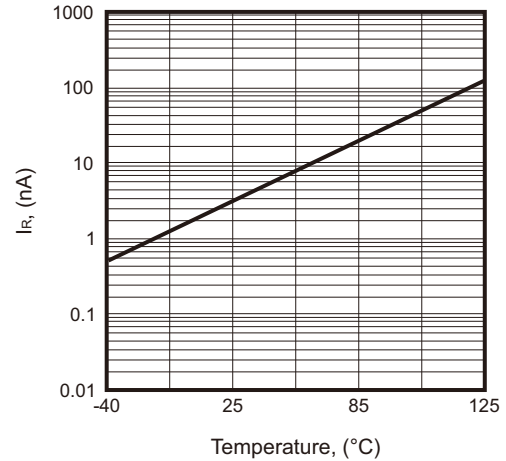


Fig.3 - Typical Capacitance vs Bias Voltage

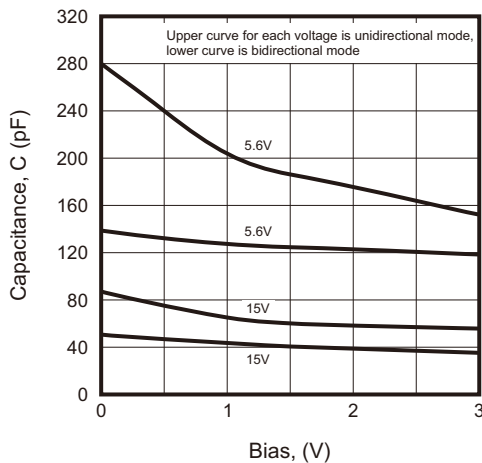


Fig.4 - Typical Capacitance vs Bias Voltage

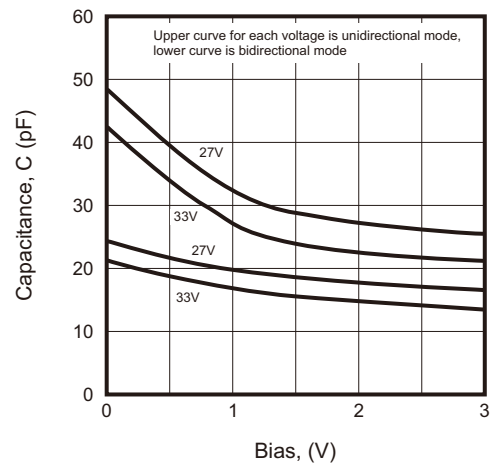


Fig.5 - Steady State Power Derating Curve

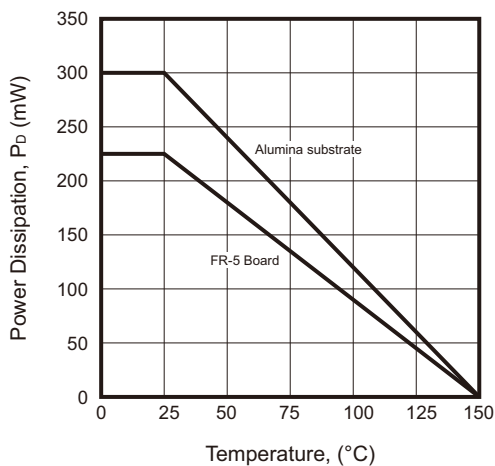
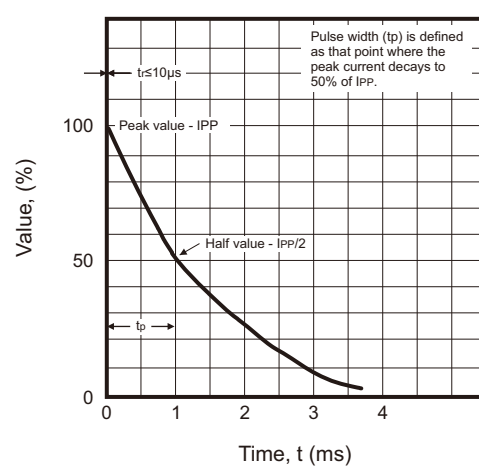
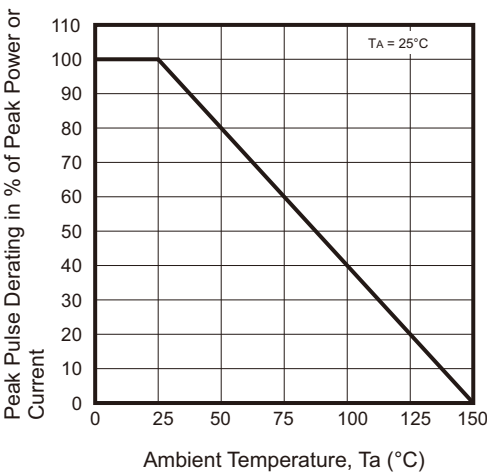


Fig.6 - Pulse Waveform

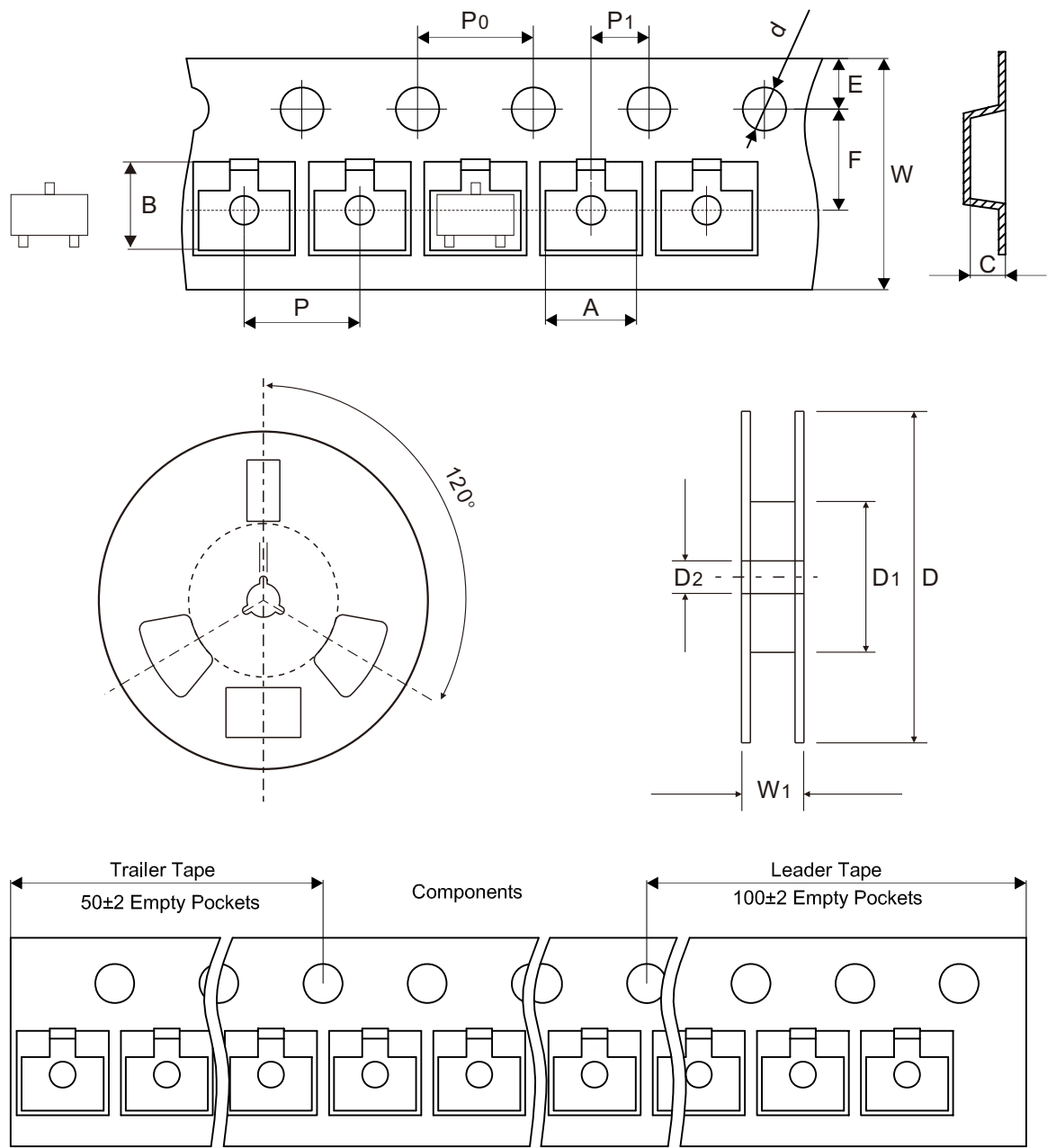


Typical Rating and Characteristic Curves (MMBZxxxAL-HF Series)

Fig.7 - Pulse Derating Curve



Reel Taping Specification

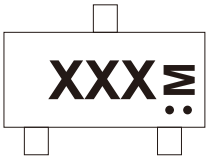


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 + 0.30 - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 - 0.004	0.484 ± 0.039

Marking Code

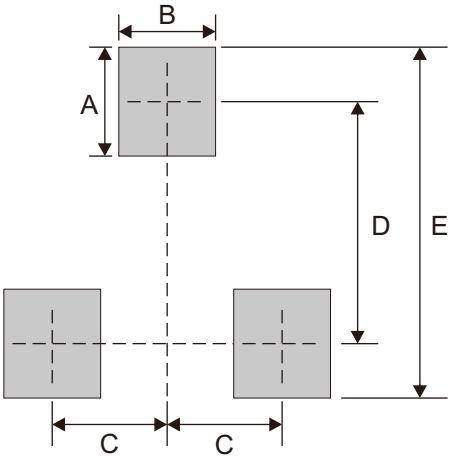
Part Number	Marking Code
MMBZ5V1AL-HF	5A1
MMBZ5V6AL-HF	5A6
MMBZ6V2AL-HF	6A2
MMBZ6V8AL-HF	6A8
MMBZ9V1AL-HF	9A1
MMBZ12VAL-HF	12A
MMBZ15VAL-HF	15A
MMBZ18VAL-HF	18A
MMBZ20VAL-HF	20A
MMBZ27VAL-HF	27A
MMBZ33VAL-HF	33A



xxx = Product type marking code
Solid dot = Control code
M = Control code

Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	0.80	0.031
C	0.95	0.037
D	2.02	0.080
E	2.82	0.111



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7