



## Zener Transient Voltage Suppressors: MMBZxxxAL Series

Rev.1.0

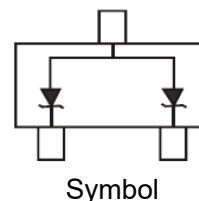
### FEATURE

- ◇ Dual TVS in common anode configuration.
- ◇ Total power dissipation: max 225mW.
- ◇ Low leakage.
- ◇ High reliability and high stability.



### DESCRIPTION

- ◇ SOT-23 small outline plastic package
- ◇ Color band denotes cathode end
- ◇ Epoxy UL: 94V-0
- ◇ Mounting position: any

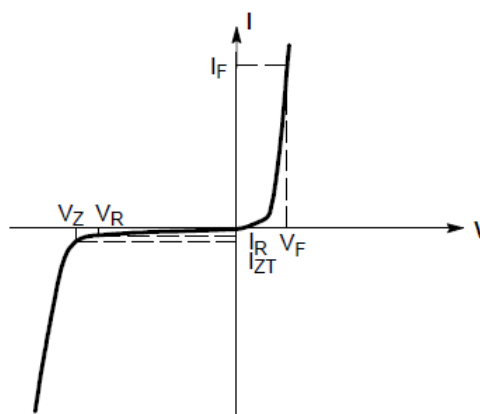


### ABSOLUTE MAXIMUM RATINGS AND THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Total power dissipation @ $T_A=25^{\circ}\text{C}$	$P_D$	225	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	556	$^{\circ}\text{C}/\text{W}$
Junction temperature range	$T_j$	-55 to+150	$^{\circ}\text{C}$
Storage temperature range	$T_s$	-55 to+150	$^{\circ}\text{C}$

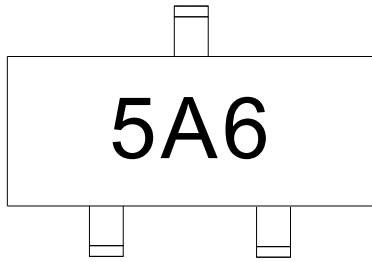
### ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ )

Symbol	Parameter
$V_Z$	Reverse zener voltage at $I_{ZT}$
$I_{ZT}$	Reverse current
$Z_{ZT}$	Maximum zener impedance at $I_{ZT}$
$I_R$	Reverse leakage current at $V_R$
$V_R$	Reverse voltage
$I_F$	Forward current
$V_F$	Forward voltage at $I_F$



Zener voltage regulator

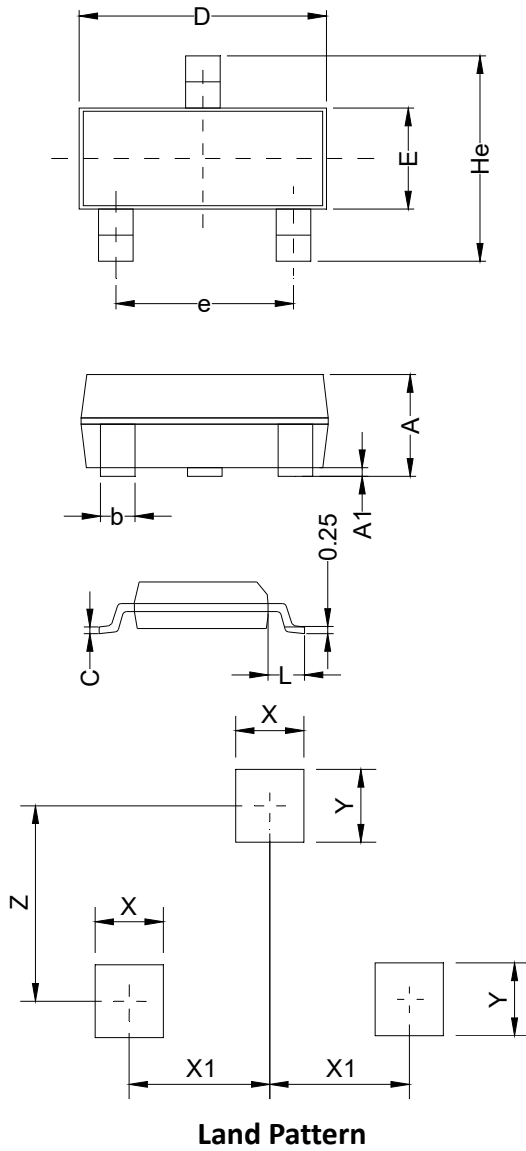
## MARKING

ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$  unless otherwise noted)Maximum  $V_F=0.9\text{V}$  @  $I_F=10\text{mA}$ 

Type number	Zener voltage range at $I_{ZT}$				Maximum reverse leakage current		$V_C$ @ $I_{PP}$		Peak pulse power	Marking
	Nom (Volts)	Min (Volts)	Max (Volts)	$I_{ZT}$ (mA)	$I_R$ ( $\mu\text{A}$ )	$V_R$ (Volts)	$V_C$ (Volts)	$I_{PP}^{\circ}$ (A)	$P_{PP}^{\circ}$ (W)	
MMBZ5V6AL	5.6	5.32	5.88	20	5.00	3.0	8.0	3.00	24	5A6
MMBZ6V2AL	6.2	5.89	6.51	1	0.50	3.0	8.7	2.76	24	6A2
MMBZ6V8AL	6.8	6.46	7.14	1	0.50	4.5	9.6	2.50	24	6A8
MMBZ9V1AL	9.1	8.65	9.56	1	0.30	6.0	14.0	2.00	24	9A1
MMBZ12VAL	12.0	11.40	12.60	1	0.20	8.5	17.0	1.42	24	12A
MMBZ15VAL	15.0	14.25	15.75	1	0.05	12.0	21.0	1.50	24	15A
MMBZ16VAL	16.0	15.20	16.80	1	0.05	13.0	23.0	1.06	24	16A
MMBZ18VAL	18.0	17.10	18.90	1	0.05	14.5	25.0	1.50	24	18A
MMBZ20VAL	20.0	19.00	21.00	1	0.05	17.0	28.0	1.00	24	20A
MMBZ27VAL	27.0	25.65	28.35	1	0.05	22.0	40.0	0.95	24	27A
MMBZ33VAL	33.0	31.35	34.65	1	0.05	26.0	46.0	0.65	24	33A

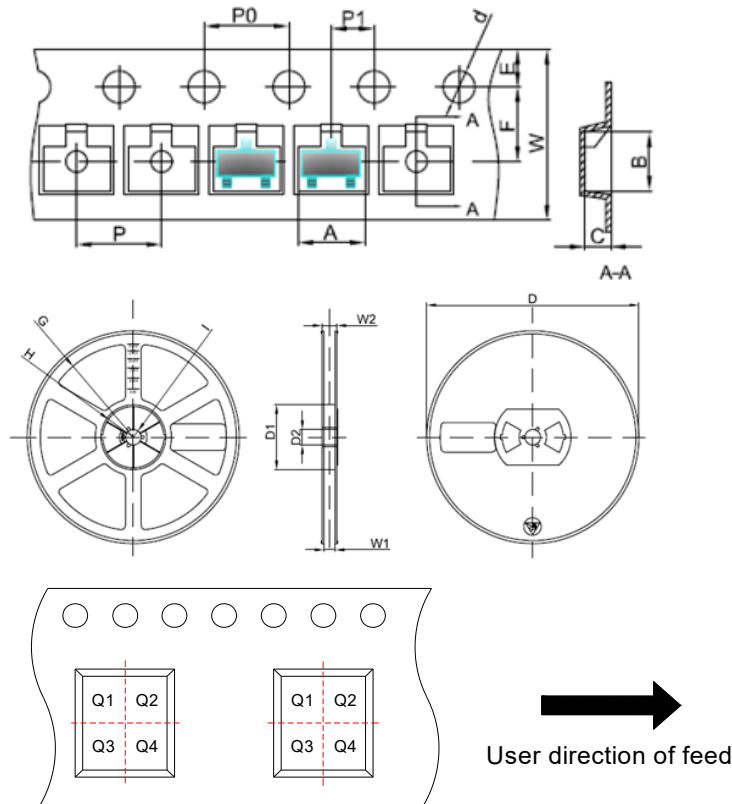
① Surge waveform: 10/1000 $\mu\text{s}$

PACKAGE MECHANICAL DATA



Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90	1.063	1.15	0.035	0.042	0.045
A1	0.00	0.075	0.14	0.000	0.003	0.006
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.07	0.10	0.15	0.003	0.004	0.006
D	2.80	2.90	3.00	0.110	0.114	0.118
e	1.80	1.90	2.00	0.071	0.075	0.079
E	1.20	1.30	1.40	0.047	0.051	0.055
L	0.55REF			0.022REF		
He	2.25	2.40	2.55	0.089	0.094	0.100
X	0.80			0.031		
X1	0.95			0.037		
Y	0.80			0.031		
Z	2.02			0.080		

TAPE AND REEL SPECIFICATION-SOT-23



Pin 1 quadrant: Q3

Packaging Description:

SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative(carbon filled) polycarbonate resin. The cover tape is a multilayer film(heat activated adhesive in nature)primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000units per 7" or 17.8cm diameter reel. The reels are clear in color and made of polystyrene plastic(anti-static coated).

Symbol	Millimeters	Inches
	Typ.	Typ.
A	3.15	0.124
B	2.77	0.109
C	1.22	0.048
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	4.00	0.157
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

ORDERING INFORMATION

Part Number	Package	Reel Size	Quantity Per Reel
MMBZxxxAL	SOT-23	7 Inch	3,000 pcs

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Fig.1 Power dissipation vs ambient temperature

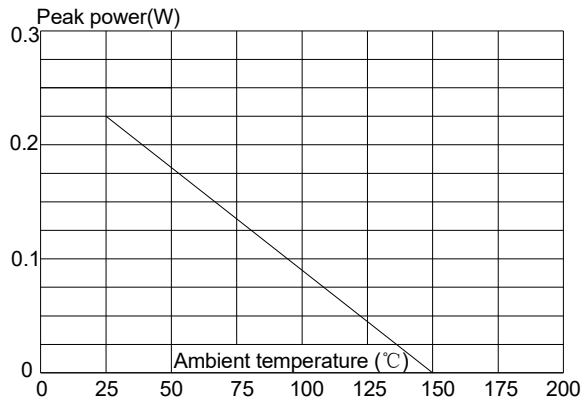


FIG.2: Pulse waveform

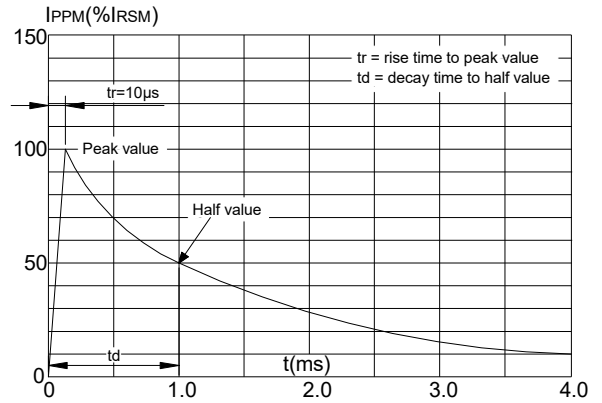
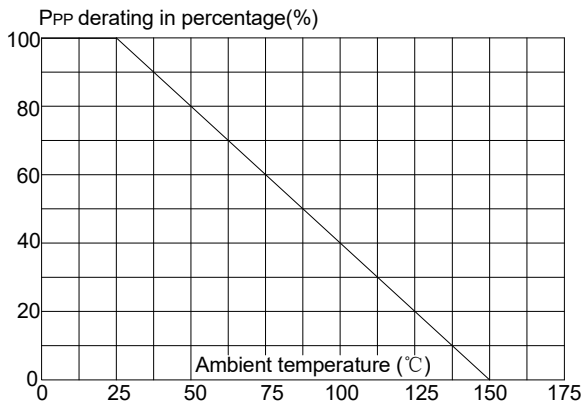


FIG.3: Pulse derating curve




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