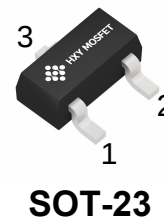




## Discription

The MMBZ6V8ALT1G protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. Excellent clamping capability, low leakage, low capacitance, and fast response time provide best in class protection on designs that are exposed to ESD.

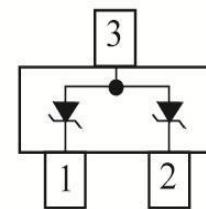
It gives designer the flexibility to protect 2 unidirectional line in applications where arrays are not practical.



SOT-23

## Features

- ◇ SOT-23 package allows either two separate unidirectional configurations or a single bidirectional configuration.
- ◇ Working peak reverse voltage 4.5V
- ◇ Standard Zener breakdown voltage 6.8V
- ◇ Peak power 24 or Watts @ 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,  $\pm 30$ kV contact Discharge
- ◇ Low leakage < 5.0 $\mu$ A



Circuit Diagram

## Ordering information

| Product ID   | Pack   | Qty(PCS) |
|--------------|--------|----------|
| MMBZ6V8ALT1G | SOT-23 | 3000     |

## Absolute Ratings ( $T_{amb}=25^{\circ}\text{C}$ )

| Symbol    | Parameter                                         | Value                              | Units                      |
|-----------|---------------------------------------------------|------------------------------------|----------------------------|
| $P_{PP}$  | Peak Pulse Power ( $t_p = 8/20\mu\text{s}$ )      | 24                                 | W                          |
| $T_L$     | Maximum lead temperature for soldering during 10s | 260                                | $^{\circ}\text{C}$         |
| $T_{stg}$ | Storage Temperature Range                         | -55 to +150                        | $^{\circ}\text{C}$         |
| $T_{op}$  | Operating Temperature Range                       | -40 to +125                        | $^{\circ}\text{C}$         |
| $T_j$     | Maximum junction temperature                      | 150                                | $^{\circ}\text{C}$         |
|           | IEC61000-4-2 (ESD)                                | air discharge<br>contact discharge | $\pm 30$<br>$\pm 30$<br>KV |



**ELECTRICAL CHARACTERISTICS (Tamb=25°C)**

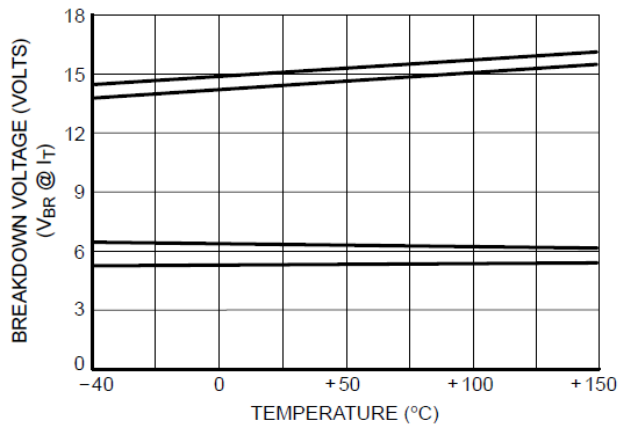
| Part<br>Number | Device<br>Marking | V <sub>RWM</sub> | I <sub>R</sub>        | V <sub>BR</sub> |     |      |                     | Z <sub>ZT</sub>         | Z <sub>ZK</sub> |                      | V <sub>C</sub> |                      |
|----------------|-------------------|------------------|-----------------------|-----------------|-----|------|---------------------|-------------------------|-----------------|----------------------|----------------|----------------------|
|                |                   | (V)              | (μA)                  | (V)             |     |      | (mA)                | (Ω)                     | (Ω)             | (mA)                 | (V)            | (A)                  |
|                |                   |                  | @<br>V <sub>RWM</sub> | Min             | Nom | Max  | @<br>I <sub>T</sub> | Max<br>@I <sub>ZT</sub> | Max             | @<br>I <sub>ZK</sub> | Max            | @<br>I <sub>PP</sub> |
| MMBZ6V8ALT1G   | 6A8               | 4.5              | 0.5                   | 6.46            | 6.8 | 7.14 | 1.0                 | --                      | --              | --                   | 9.6            | 2.5                  |

V<sub>F</sub>=0.9V Max @ I<sub>F</sub>=10mA

Note 1: Surge Current waveform per Figure 5

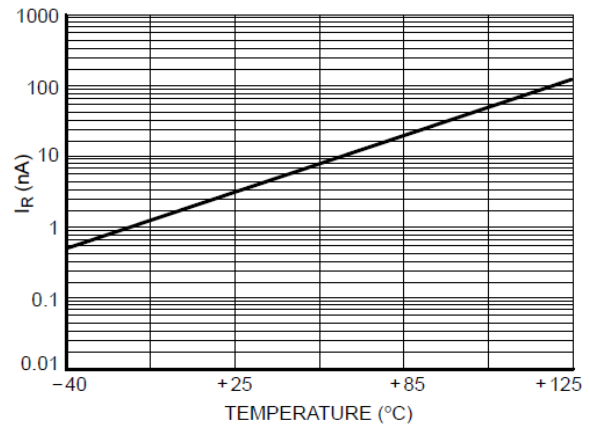


## ELECTRICAL CHARACTERISTICS CURVE

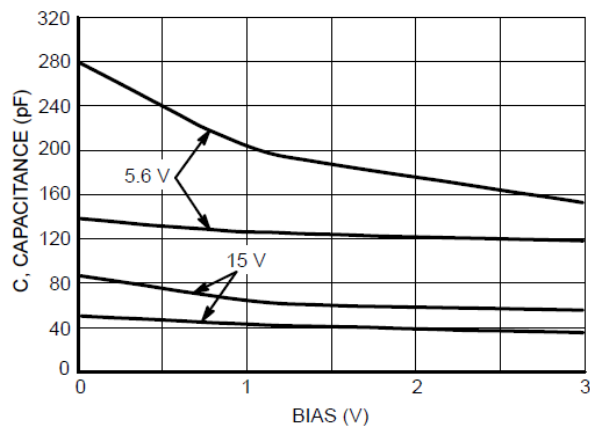


**Figure 1. Typical Breakdown Voltage versus Temperature**

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

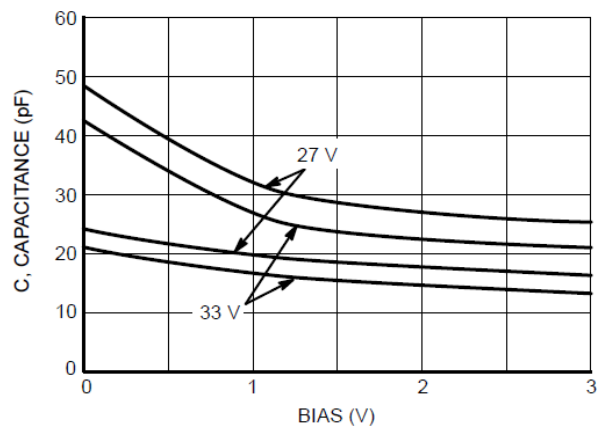


**Figure 2. Typical Leakage Current versus Temperature**



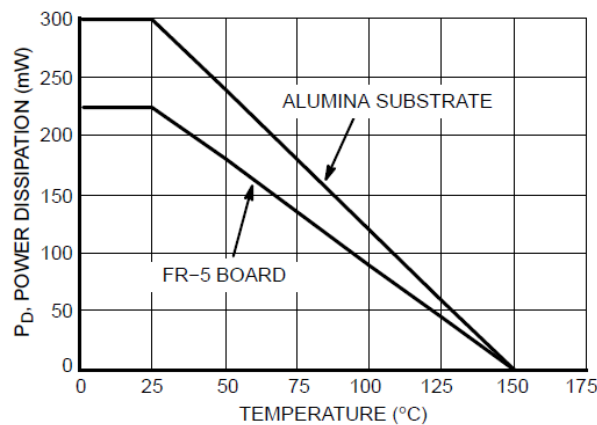
**Figure 3. Typical Capacitance versus Bias Voltage**

(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**



## ELECTRICAL CHARACTERISTICS CURVE

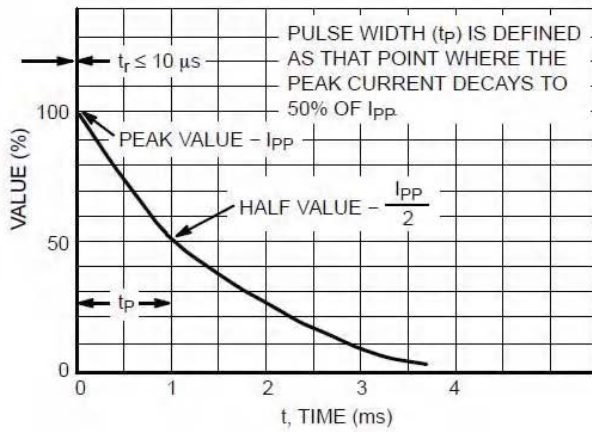


Figure 6. Pulse Waveform

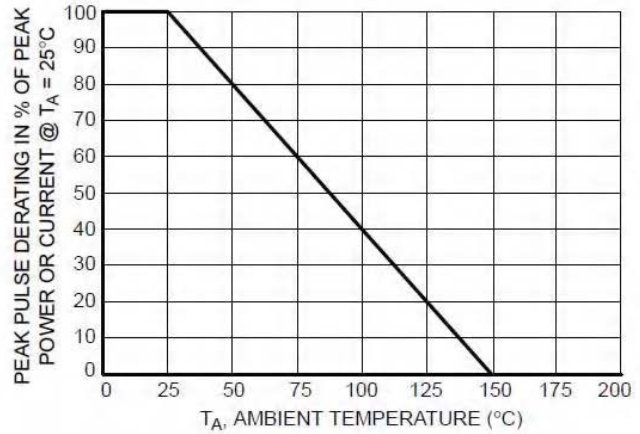


Figure 7. Pulse Derating Curve

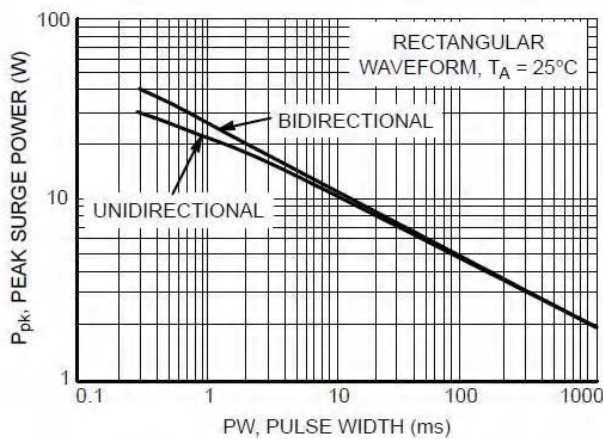


Figure 8. Maximum Non-repetitive Surge Power,  $P_{pk}$  versus PW

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

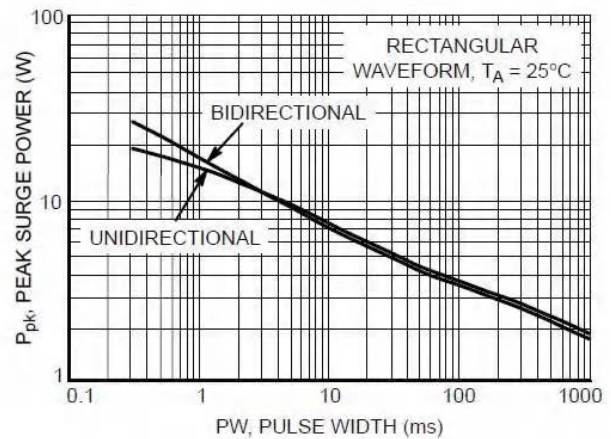
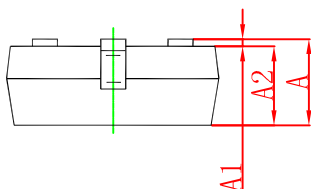
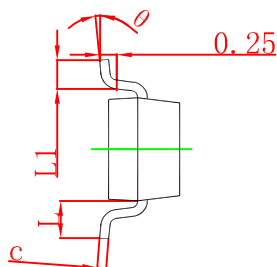
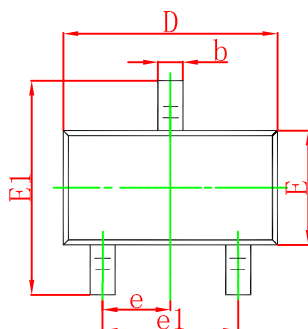


Figure 9. Maximum Non-repetitive Surge Power,  $P_{pk(NOM)}$  versus PW

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.

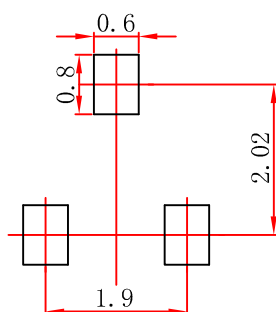


## SOT-23 Package Outline Dimensions



| 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      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.



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