

### Features

- ◆ 150 Watts peak pulse power ( $t_p = 8/20\mu s$ )
- ◆ Transient protection for high speed data lines to IEC 61000-4-2 (ESD)  $\pm 15kV$  (air),  $\pm 8kV$  (contact) IEC 61000-4-4 (EFT) 40A (5/50ns)
- ◆ Working voltages : 24V
- ◆ Protects one bidirectional line or two unidirectional lines
- ◆ Low operating and clamping voltages
- ◆ Solid-state silicon avalanche technology

### Mechanical Characteristics

- ◆ Package: SOT23
- ◆ Lead Finish: Matte Tin
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Pb-Free, Halogen Free, RoHS/WEEE Compliant

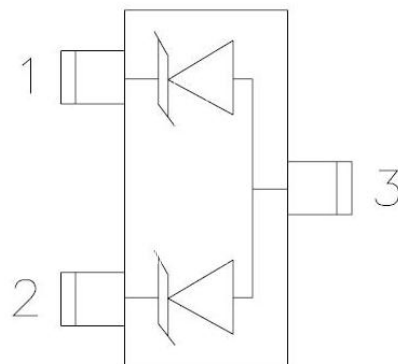
### Applications

- ◆ USB Power & Data Line Protection
- ◆ Monitors and Flat Panel Displays
- ◆ I<sup>2</sup>C Bus Protection
- ◆ Portable Instrumentation
- ◆ Set Top Box

### Ordering Information

| Part Number | Qty per Reel | Reel Size |
|-------------|--------------|-----------|
| MMBZ27VAL   | 3000         | 7"        |

### Dimensions and Pin Configuration



Circuit and Pin Schematic

**Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

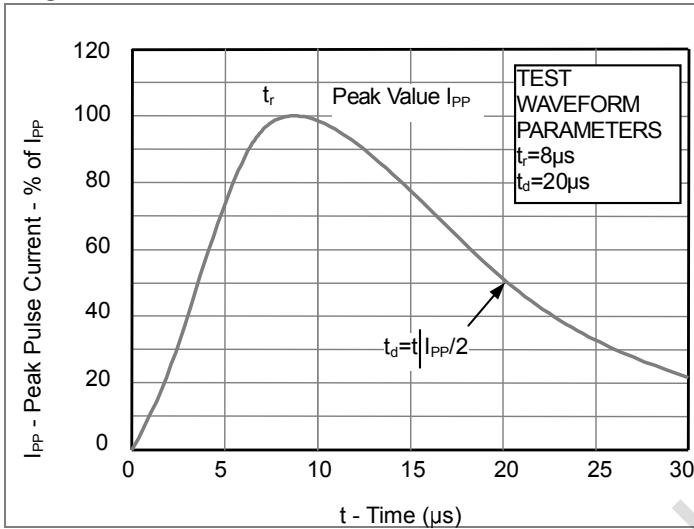
| Parameter                                | Symbol           | Value       | Unit             |
|--|------------------|-------------|------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | Ppk              | 180         | W                |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | I <sub>PP</sub>  | 3           | A                |
| ESD per IEC 61000-4-2 (Air)              | VESD             | $\pm 30$    | kV               |
| ESD per IEC 61000-4-2 (Contact)          |                  | $\pm 30$    |                  |
| Operating Temperature Range              | T <sub>J</sub>   | -55 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range                | T <sub>stg</sub> | -55 to +150 | $^\circ\text{C}$ |

**Electrical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

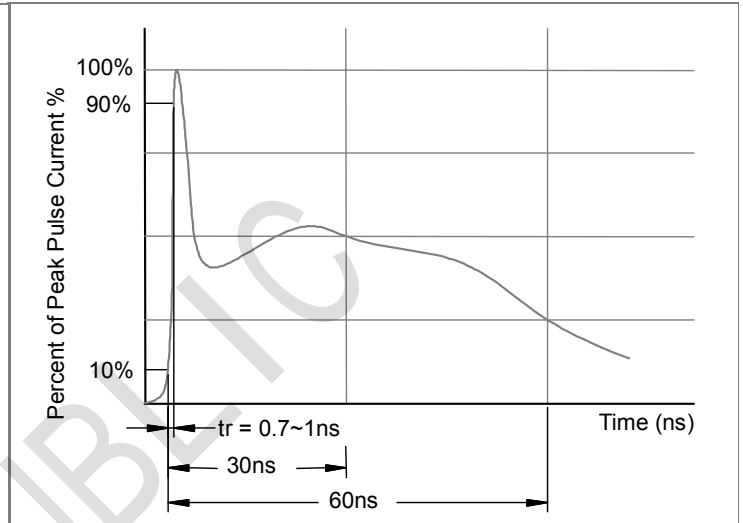
| Parameter                 | Symbol           | Conditions  | Min | Typ  | Max | Unit          |
|---------------------------|------------------|---|-----|------|-----|---------------|
| Reverse working voltage   | V <sub>RWM</sub> |   |     |      | 24  | V             |
| Reverse breakdown voltage | V <sub>BR</sub>  | I <sub>T</sub> =1mA                                     | 26  |      | 32  | V             |
| Reverse leakage current   | I <sub>R</sub>   | V <sub>RWM</sub> =24V                                   |     | 0.01 | 1.0 | $\mu\text{A}$ |
| Clamping voltage          | V <sub>C</sub>   | I <sub>PP</sub> =3A, t <sub>P</sub> =8/20 $\mu\text{s}$ |     | 45   | 62  | V             |
| Junction capacitance      | C <sub>J</sub>   | V <sub>RWM</sub> =0V, f=1MHz                            |     | 20   |     | pF            |

**PROTECTION PRODUCTS**  
Typical characteristics

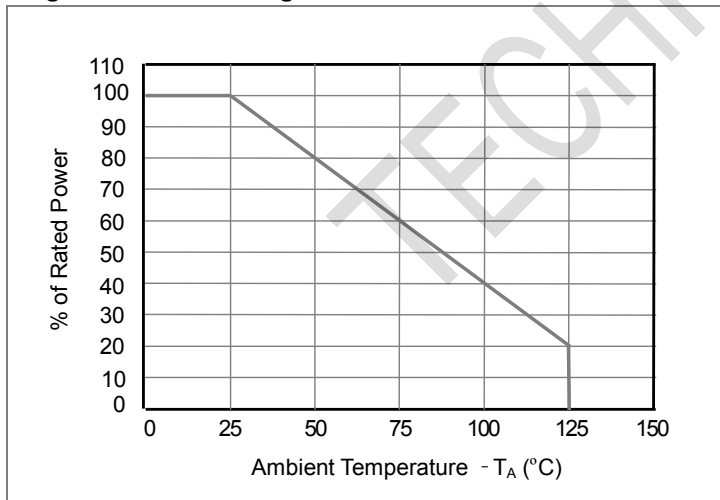
**Fig1. 8/20 $\mu$ s Pulse Waveform**



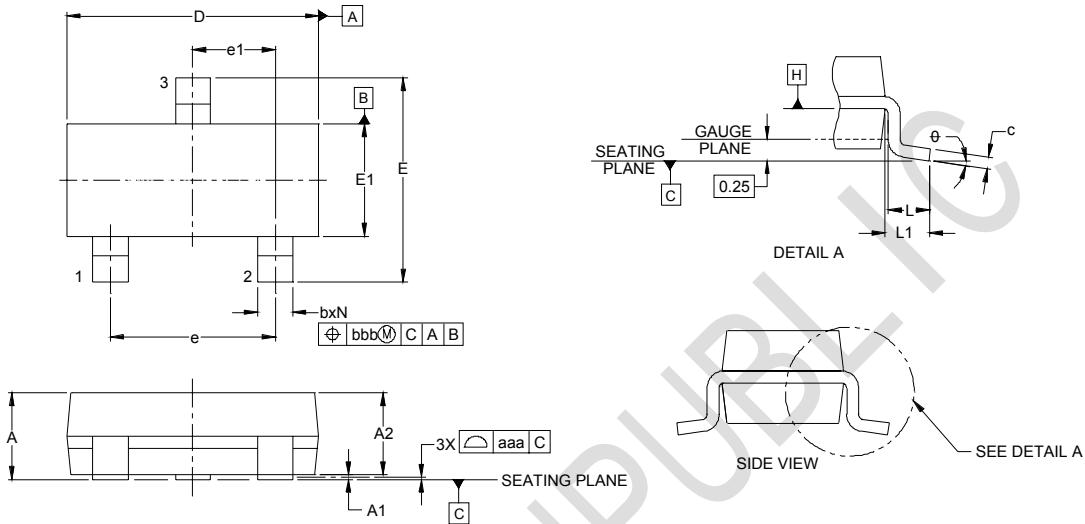
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



**Fig3. Power Derating Curve**

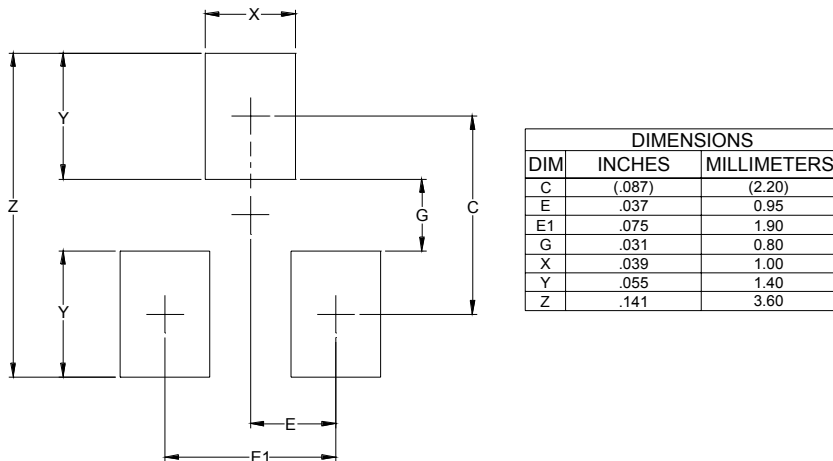


**Outline Drawing - SOT23**



| DIM    | INCHES |      |      | MILLIMETERS |      |      |
|--------|--------|------|------|-------------|------|------|
|        | MIN    | NOM  | MAX  | MIN         | NOM  | MAX  |
| A      | .035   | -    | .044 | 0.89        | -    | 1.12 |
| A1     | .000   | -    | .004 | 0.01        | -    | 0.10 |
| A2     | .035   | .037 | .040 | 0.88        | 0.95 | 1.02 |
| b      | .012   | -    | .020 | 0.30        | -    | 0.51 |
| c      | .003   | -    | .007 | 0.08        | -    | 0.18 |
| D      | .110   | .114 | .120 | 2.80        | 2.90 | 3.04 |
| E      | .082   | .093 | .104 | 2.10        | 2.37 | 2.64 |
| E1     | .047   | .051 | .055 | 1.20        | 1.30 | 1.40 |
| e      | .075   |      |      | 1.90 BSC    |      |      |
| e1     | .037   |      |      | 0.95 BSC    |      |      |
| L      | .015   | .020 | .024 | 0.40        | 0.50 | 0.60 |
| L1     | .022   |      |      | (0.55)      |      |      |
| N      | 3      |      |      | 3           |      |      |
| $\phi$ | 0°     | -    | 8°   | 0°          | -    | 8°   |
| aaa    | .004   |      |      | 0.10        |      |      |
| bbb    | .008   |      |      | 0.20        |      |      |

**Land Pattern - SOT23**



| DIMENSIONS |        |             |
|------------|--------|-------------|
| DIM        | INCHES | MILLIMETERS |
| C          | (.087) | (2.20)      |
| E          | .037   | 0.95        |
| E1         | .075   | 1.90        |
| G          | .031   | 0.80        |
| X          | .039   | 1.00        |
| Y          | .055   | 1.40        |
| Z          | .141   | 3.60        |