

**Features**

- Protects Two Bi-Directional lines
- Ultra Low Leakage: nA Level
- Low Clamping Voltage
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

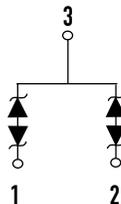
**Maximum Ratings**

- Operating Junction Temperature Range: -55°C to +125°C
- Storage Temperature Range: -55°C to +150°C

| MCC Part Number | Device Marking |
|-----------------|----------------|
| SM12B           | 12C            |

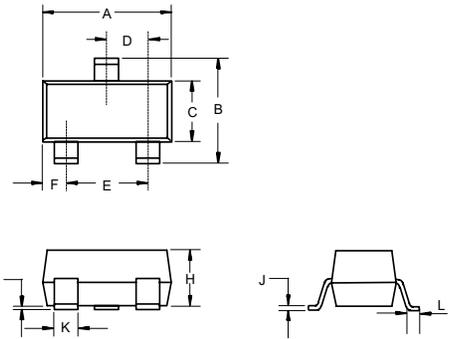
| Parameter                  | Symbol          | Limits         |
|----------------------------|-----------------|----------------|
| IEC61000-4-2(ESD)          | Air Contact     | ±30KV<br>±30KV |
| IEC61000-4-4 (EFT) @5/50ns |                 | 40A            |
| Peak Pulse Current(8/20µs) | I <sub>PP</sub> | 10A            |
| Peak Pulse Power (8/20us)  | P <sub>PK</sub> | 300W           |

**Internal Structure**



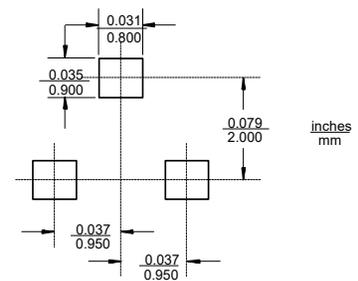
**ESD Protection Device**

**SOT-23**



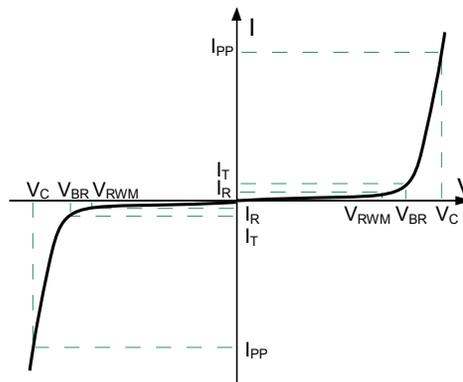
| DIM | DIMENSIONS |       |      |      | NOTE |
|-----|------------|-------|------|------|------|
|     | INCHES     |       | MM   |      |      |
|     | MIN        | MAX   | MIN  | MAX  |      |
| A   | 0.110      | 0.120 | 2.80 | 3.04 |      |
| B   | 0.083      | 0.104 | 2.10 | 2.64 |      |
| C   | 0.047      | 0.055 | 1.20 | 1.40 |      |
| D   | 0.034      | 0.041 | 0.85 | 1.05 |      |
| E   | 0.067      | 0.083 | 1.70 | 2.10 |      |
| F   | 0.018      | 0.024 | 0.45 | 0.60 |      |
| G   | 0.0004     | 0.006 | 0.01 | 0.15 |      |
| H   | 0.035      | 0.043 | 0.90 | 1.10 |      |
| J   | 0.003      | 0.007 | 0.08 | 0.18 |      |
| K   | 0.012      | 0.020 | 0.30 | 0.51 |      |
| L   | 0.007      | 0.020 | 0.20 | 0.50 |      |

**Suggested Solder Pad Layout**



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Symbol    | Parameter                                   |
|-----------|---|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
| $I_R$     | Maximum Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_T$     | Test Current                                |
| C         | Capacitance @ $V_R=0$ and $f=1\text{MHz}$   |



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter                 | Symbol    | Conditions   | Min. | Typ. | Max. | Units         |
|---------------------------|-----------|--|------|------|------|---------------|
| Reverse Working Voltage   | $V_{RWM}$ |  |      |      | 12   | V             |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T = 1\text{mA}$   | 13.3 |      |      | V             |
| Reverse Leakage Current   | $I_R$     | $V_{RWM} = 12\text{V}$   |      |      | 0.5  | $\mu\text{A}$ |
| Clamping Voltage          | $V_C$     | $I_{PP}=1\text{A}$ , $t_p=8/20\mu\text{s}$                             |      |      | 20   | V             |
| Clamping Voltage          | $V_C$     | $I_{PP}=10\text{A}$ , $t_p=8/20\mu\text{s}$                            |      |      | 30   | V             |
| Junction Capacitance      | $C_J$     | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ ,<br>Pin 1 to 3 or<br>Pin 2 to 3 |      | 32   |      | pF            |

**Curve Characteristics**

Fig. 1 - 8 X 20µs Pulse Waveform

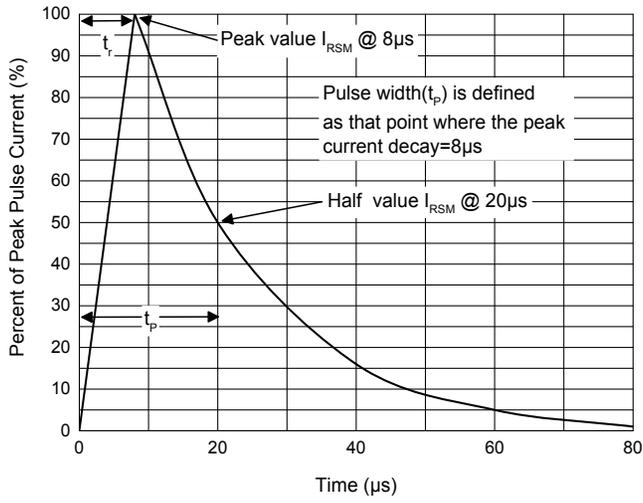
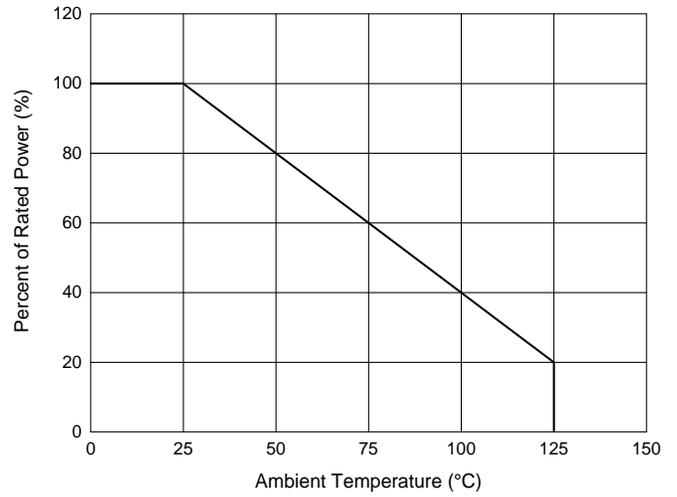


Fig. 2 - Pulse Derating Curve



## Ordering Information

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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