



### General Description

This integrated transient voltage suppressor device (TVS) is designed for applications requiring transient overvoltage protection, printers, business machines, communication systems, medical equipment, and other applications. Its integrated design provides very effective and reliable protection for separate lines using only one package. These devices are ideal for situations where board space is at a premium.

### Applications

- Serial and Parallel Ports
- Microprocessor Based Equipment
- Notebooks, Desktops, Servers
- Cellular and Portable Equipment

### Features

- Four Separate Unidirectional Configurations for Protection
- Low Leakage Current < 1  $\mu$  A @ 3Volts
- Power Dissipation: 380mW
- Small SOT-553 SMT Package
- Low Capacitance
- Complies to USB 1.1 Low Speed & Speed Specifications
- **Pb-Free package is available**  
RoHS product for packing code suffix "G"  
Halogen free product for packing code suffix "H"

### Complies with the following standards

IEC61000-4-2

Level 4 15 kV (air discharge)

8 kV(contact discharge)

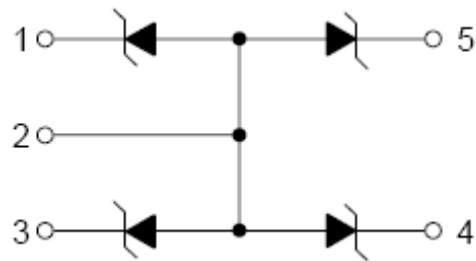
MIL STD 883E - Method 3015-7 Class 3

25 kV HBM (Human Body Model)

### Functional diagram



SOT-553

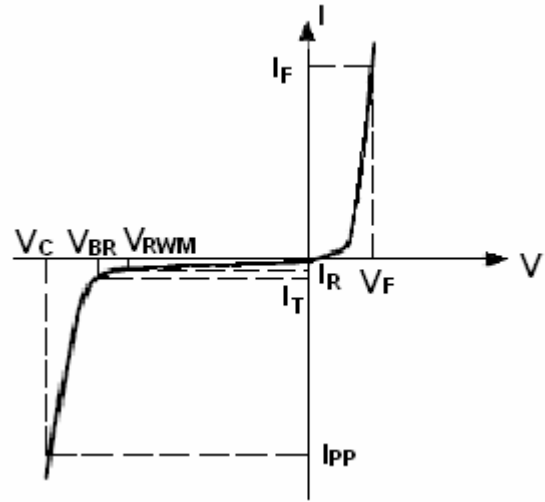


| Maximum Ratings (T <sub>A</sub> =25°C) |   |             |               |
|--|---|-------------|---------------|
| Symbol                                 | Parameter   | Value       | Units         |
| P <sub>PK</sub>                        | Peak Power Dissipation(8 × 20 $\mu$ s@T <sub>A</sub> =25°C)   | 25          | W             |
| P <sub>D</sub>                         | Steady State Power-1 Diode                                    | 380         | mW            |
| R <sub>θJA</sub>                       | Thermal Resistance, Junction-to-Ambient<br>Above 25°C, Derate | 327<br>3.05 | °C/W<br>Mw/°C |
| T <sub>Jmax</sub>                      | Maximum Junction Temperature                                  | 150         | °C            |
| T <sub>J</sub> T <sub>stg</sub>        | Operation Junction and Storage Temperature Range              | -55 to +150 | °C            |
| T <sub>L</sub>                         | Lead Solder Temperature(10 seconds duration)                  | 260         | °C            |



### Electrical Parameter

| 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 @ $V_{RWM}$ |
| $I_T$     | Test Current                                |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_F$     | Forward Current                             |
| $V_F$     | Forward Voltage @ $I_F$                     |



### Electrical Characteristics

| Part Numbers | $V_{BR}$ |      |      | $I_T$ | $V_{RWM}$ | $I_R$ | C            |
|--------------|----------|------|------|-------|-----------|-------|--------------|
|              | Min.     | Typ. | Max. |       |           |       | Typ. 0v bias |
|              | V        | V    | V    |       |           |       | pF           |
| MSEMF3V3LC   | 5.3      | 5.6  | 5.9  | 1     | 3.0       | 1.0   | 12           |
| MSEMF05LC    | 6.1      | 6.8  | 7.2  | 1     | 5.0       | 1.0   | 8            |

1. Non-repetitive current per Figure 1.
2. Only 1 diode under power. For 4 diodes under power
3. Capacitance of one diode at  $f=1\text{MHz}, T_A=25^\circ\text{C}$

### Typical Characteristics

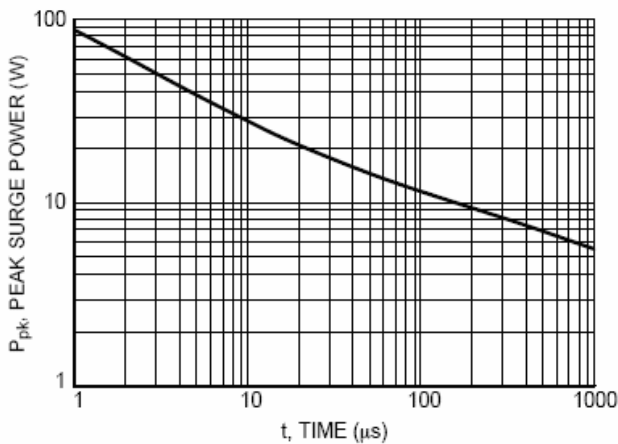


Figure 1 Pulse Width

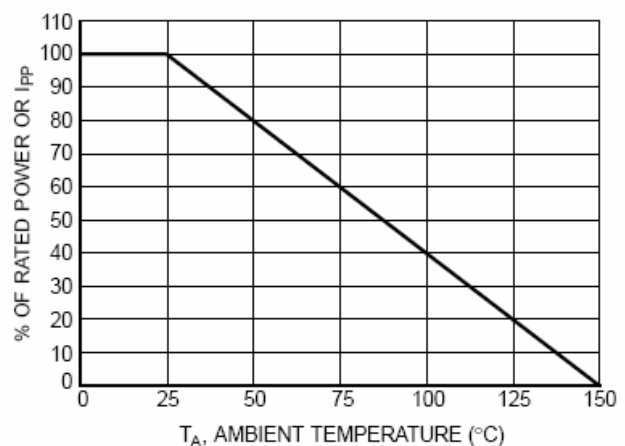


Figure 2 Power Derating Curve

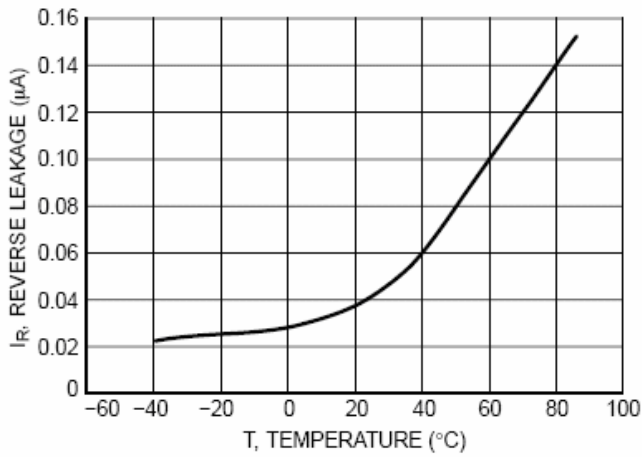


Figure 3 Reverse Leakage versus temperature

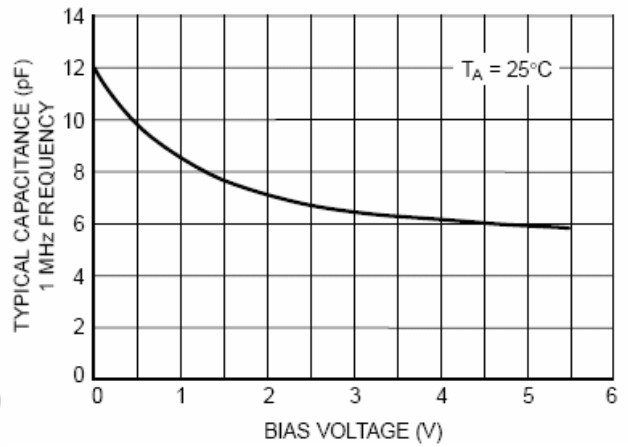


Figure 4 Capacitance

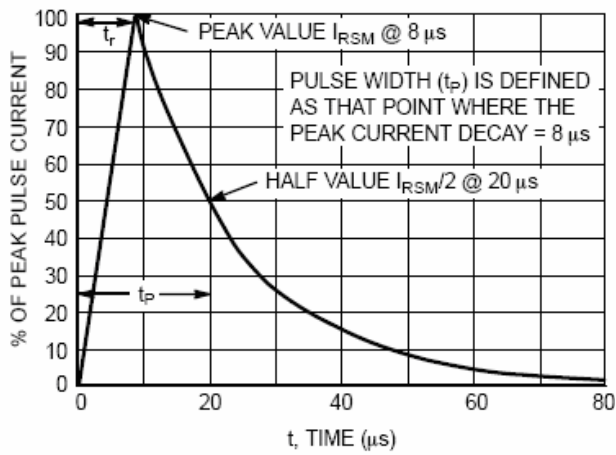


Figure 5 8\*20 Pulse Waveform

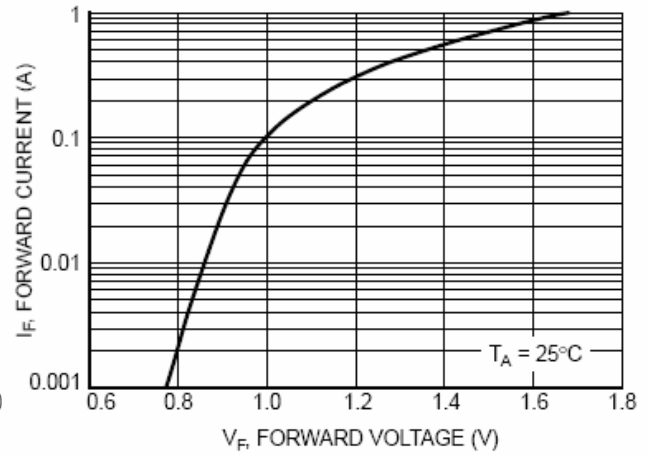
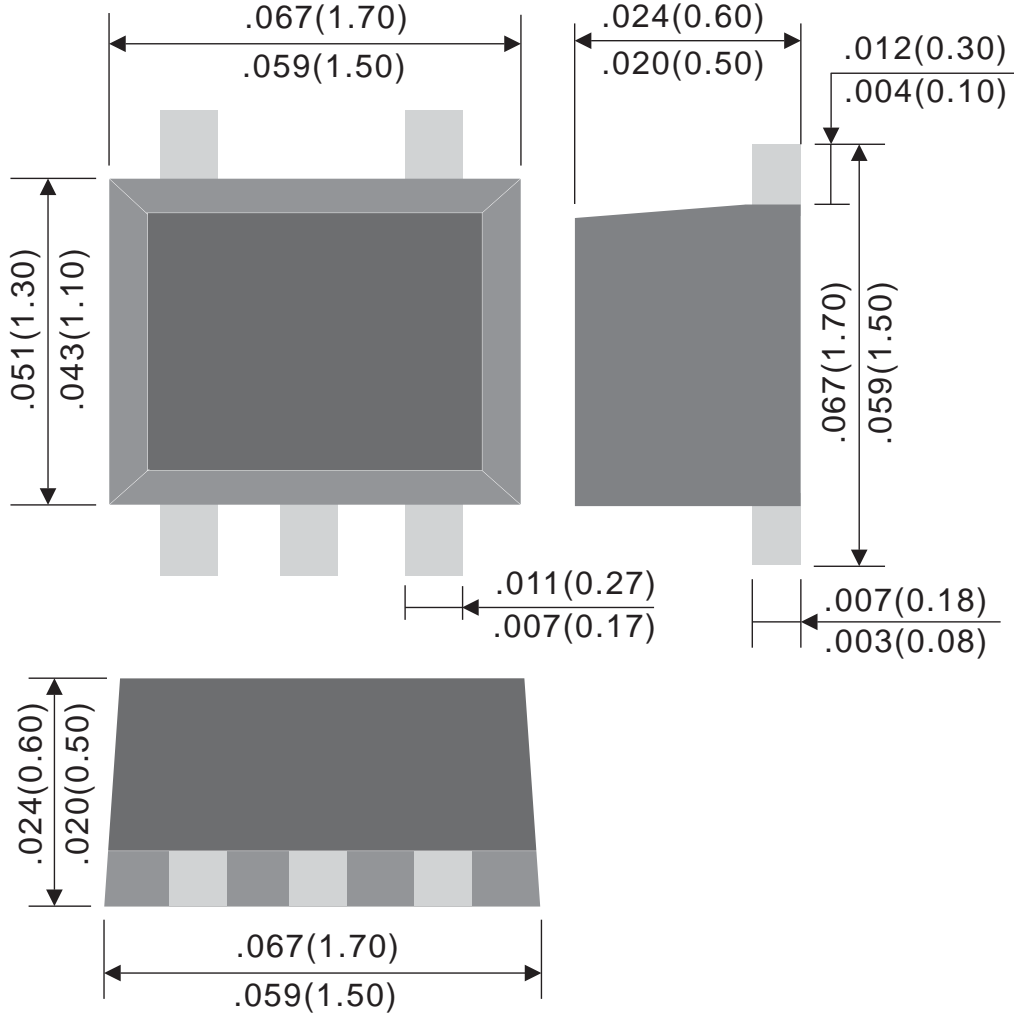


Figure 6 Forward Voltage



### SOT-553 Mechanical Data



Dimensions in inches and (millimeters)

### Marking

| Type number | Marking code |
|-------------|--------------|
| MSEMF3V3LC  | VB           |
| MSEMF05LC   | VC           |

### SOLDERING FOOTPRINT\*

