

WE03MF

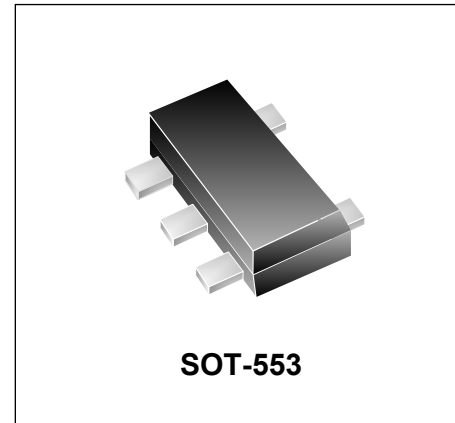
Transient Voltage Suppressor

Features

- Solid-state silicon-avalanche technology
- 30 Watts Peak Pulse Power per Line ($t_p=8/20\mu s$)
- Low operating and clamping voltages
- Up to Four (4) Lines of Protection
- Working Voltages: 5 V
- Low Leakage Current

IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) $\pm 15kV$ (air), $\pm 8kV$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)



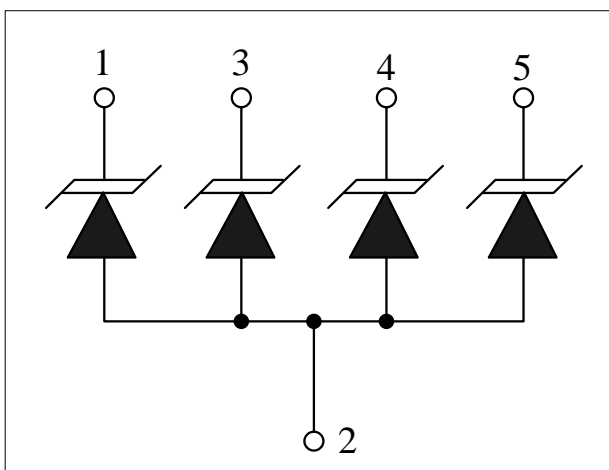
Mechanical Characteristics

- SOT-553 package
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

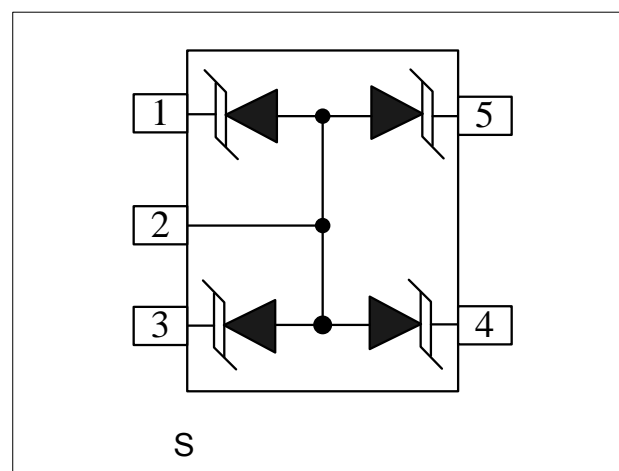
Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player

Circuit Diagram



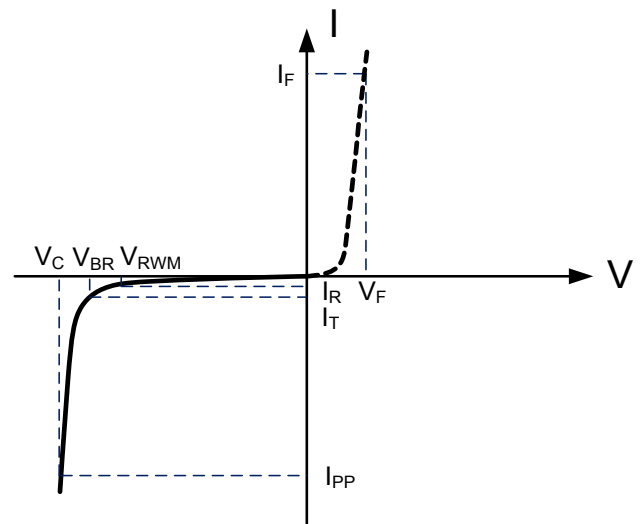
Schematic & PIN Configuration



| Absolute Maximum Rating | | | |
|--|-----------|--------------|-------|
| Rating | Symbol | Value | Units |
| Peak Pulse Power ($t_p = 8/20\mu s$) | P_{PP} | 30 | Watts |
| Peak Forward Voltage ($I_F = 1A, t_p = 8/20\mu s$) | V_{FP} | 1.5 | V |
| Operating Temperature | T_J | -55 to + 125 | °C |
| Storage Temperature | T_{STG} | -55 to +150 | °C |

Electrical Parameters (T=25°C)

| 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 |
| I_F | Forward Current |
| V_F | Forward Voltage @ I_F |



Electrical Characteristics

| WE03MF | | | | | | |
|---------------------------|-----------|---|---------|---------|---------|---------|
| Parameter | Symbol | Conditions | Minimum | Typical | Maximum | Units |
| Reverse Stand-Off Voltage | V_{RWM} | | | | 3.3 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_T = 1mA$ | 4.0 | | | V |
| Reverse Leakage Current | I_R | $V_{RWM} = 5V, T = 25°C$ | | | 1 | μA |
| Peak Pulse Current | I_{PP} | $t_p = 8/20\mu s$ | | | 3 | A |
| Clamping Voltage | V_C | $I_{PP} = 3A, t_p = 8/20\mu s$ | | 9 | 12 | V |
| Junction Capacitance | C_j | Between I/O pins and Ground $V_R = 0V, f = 1MHz$ | | 8 | | pF |

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

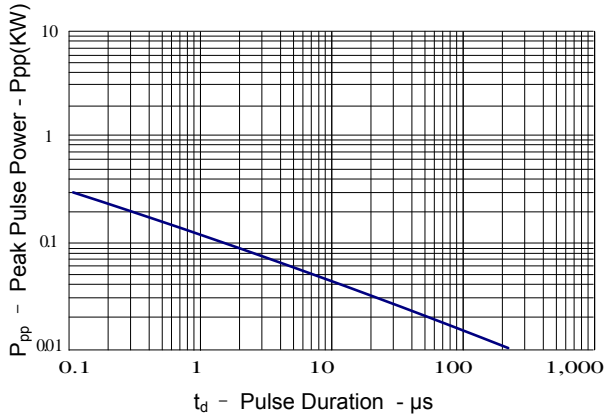


Figure 2: Power Derating Curve

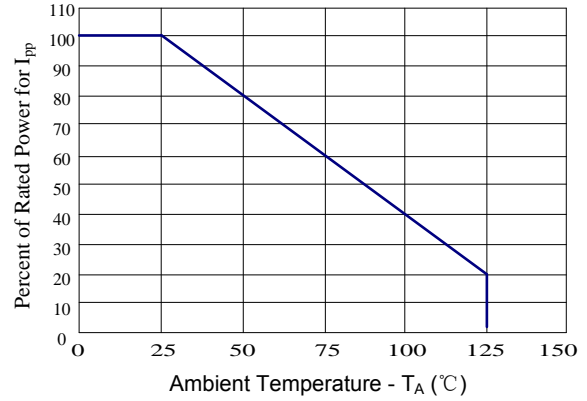


Figure 3: WE05MF Insertion Loss



Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

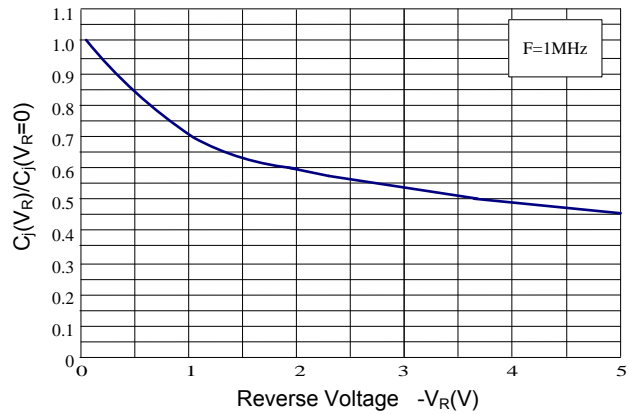
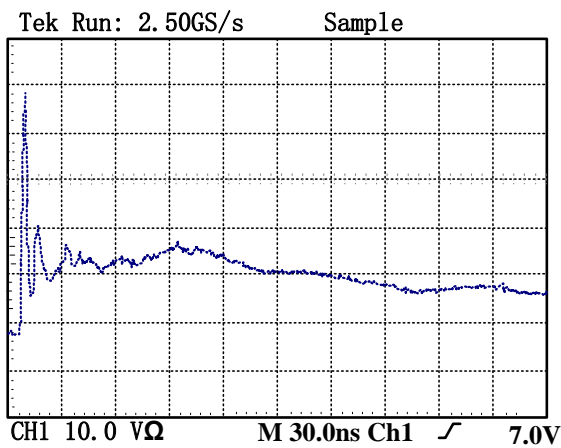


Figure 5: ESD Clamping(8kV Contact per IEC 61000-4-2)



Application Information

The WE03MF are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD or EFT. This product provides unidirectional protection; the device is connected as follows:

UNIDIRECTIONAL COMMON-MODE CONFIGURATION

The WE03MF provides up to four (4) lines of protection in a common-mode configuration as depicted in Figure 1. Circuit connectivity is as follows:

- I/O 1 is connected to Pin 5.
- I/O 2 is connected to Pin 4.
- I/O 3 is connected to Pin 3.
- I/O 4 is connected to Pin 1.
- Pin 2 is connected to ground.

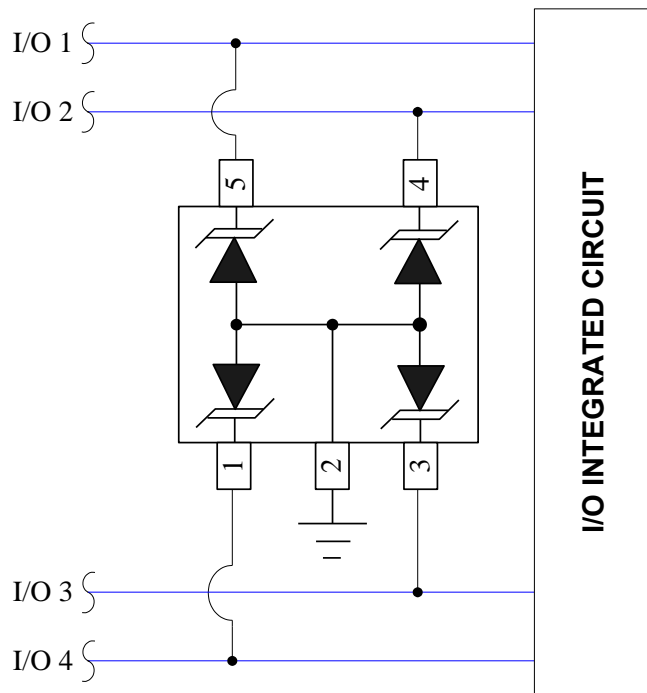


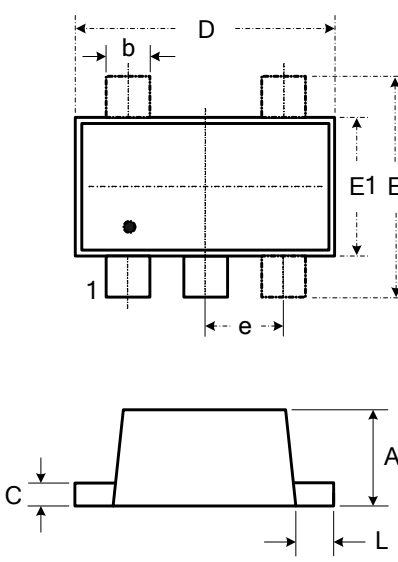
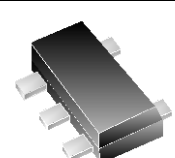
Figure 1 Unidirectional Configuration Common-Mode I/O Port Protections

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:

- The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- The path length between the TVS device and the protected line should be minimized.
- All conductive loops including power and ground loops should be minimized.
- The transient current return path to ground should be kept as short as possible to reduce parasitic inductance.
- Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

Outline Drawing – SOT-553

| PACKAGE OUTLINE | | DIMENSIONS | | | |
|--|--------|---|------------|-------|--|
|  | |  <p style="text-align: center;">SOT-553</p> | | | |
| SYMBOL | INCHES | | MILLIMETER | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.021 | 0.024 | 0.525 | 0.600 | |
| b | 0.007 | 0.011 | 0.170 | 0.270 | |
| C | 0.004 | 0.006 | 0.090 | 0.160 | |
| D | 0.059 | 0.067 | 1.500 | 1.700 | |
| E | 0.059 | 0.067 | 1.500 | 1.700 | |
| E1 | 0.043 | 0.051 | 1.100 | 1.300 | |
| e | 0.018 | 0.022 | 0.450 | 0.550 | |
| L | 0.004 | 0.012 | 0.100 | 0.300 | |

| DIMENSIONS | | |
|------------|------------|-------------|
| DIM | INCHES | MILLIMETERS |
| Z | 0.0708 | 1.80 |
| G | 0.0354 | 0.90 |
| P | 0.0197 TYP | 0.50 TYP |
| X | 0.0118 | 0.3 |
| Y | 0.0177 | 0.45 |

Notes

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Dimensions are exclusive of mold flash and metal burrs.

Marking Codes

| | |
|--------------|--------|
| Part Number | WE03MF |
| Marking Code | E3F |