

Surface Mount TVS For ESD Protection Diode

Pb Lead(Pb)-Free

General Description:

The ESD9DXX Series is designed to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space is at a premium.

Applications:

- *Cellular phones audio
- *MP3 players
- *Digital cameras
- *Portable applications
- *mobile telephone

Features:

- *Small Body Outline Dimensions: 0.039" x 0.024" (1.0 mm x 0.60 mm)
- *Low Body Height: 0.017" (0.43 mm) Max
- *Stand-off Voltage: 3.3 V – 5.0 V
- *Low Leakage
- *Response Time is Typically < 1 ns
- *ESD Rating of Class 3 (> 16 kV) per Human Body Model
- *IEC61000-4-2 Level 4 ESD Protection
- *These are Pb-Free Devices

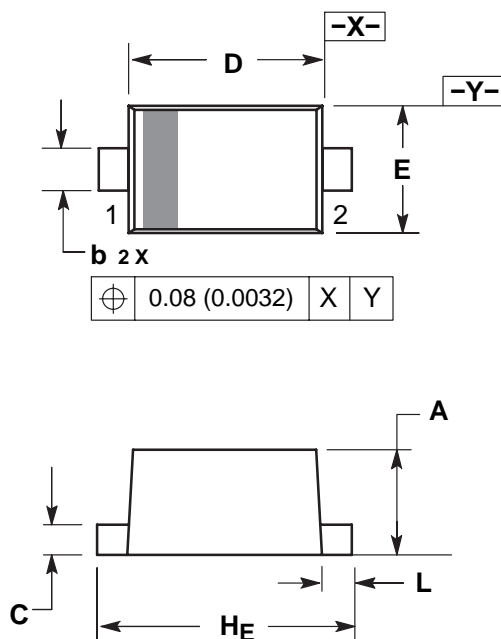
**TRANSIENT VOLTAGE
SUPPRESSORS
100 WATTS
3.3-5.0 VOLTS**



SOD-923

SOD-923 Outline Dimensions

Unit:mm



| MILLIMETERS | | | |
|-------------|------|------|------|
| DIM | MIN | NOM | MAX |
| A | 0.36 | 0.40 | 0.43 |
| b | 0.15 | 0.20 | 0.25 |
| c | 0.07 | 0.12 | 0.17 |
| D | 0.75 | 0.80 | 0.85 |
| E | 0.55 | 0.60 | 0.65 |
| HE | 0.95 | 1.00 | 1.05 |
| L | 0.05 | 0.10 | 0.15 |

Maximum Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

| Characteristic | Symbol | Value | Unit |
|--|----------------|---------------------|--------------------|
| Peak Power Dissipation ($t_p=8/20\ \mu\text{s}$) | P_{PP} | 100 | W |
| Total Power Dissipation on FR-5 Board (Note1) @ $T_a=25^{\circ}\text{C}$ | PD | 150 | mW |
| IEC61000-4-2(ESD) air discharge contact discharge | | ± 15 ± 8 | KV |
| ESD Voltage Per Human Body Model | | 16 | KV |
| Lead Solder Temperature -Maximum (10 second Duration) | T_L | 260 | $^{\circ}\text{C}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^{\circ}\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Rating are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-5 = 1.0*0.75*0.62 in.

Electrical Characteristics ($T_a=25^{\circ}\text{C}$ unless otherwise noted, $V_F=0.9\text{V}$ Max. @ $I_F=10\text{mA}$ for all types)

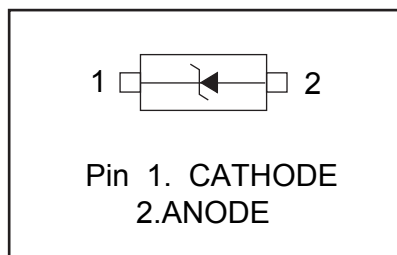
| Device | Marking | V_{RWM} | I_R (μA) | V_{BR} (V) @ I_T | I_T | I_{PP} (Note 3) | V_C (V)(Note 3) | P_{pk} | C (pF) |
|----------|---------|-----------|-------------------------|----------------------|-------|-------------------|-------------------|------------------------------|----------|
| | | (V) | @ V_{RWM} | (Note 2) | (mA) | (A) | @ Max I_F | (W) (8*20 μs) | |
| | | Max | Max | Min | | Typ | Max | Max | Typ |
| ESD9D3.3 | E | 3.3 | 2.5 | 5.0 | 1.0 | 9.8 | 10.4 | 102 | 80 |
| ESD9D5.0 | G | 5.0 | 1.0 | 6.2 | 1.0 | 8.7 | 12.3 | 107 | 65 |

Over voltage available upon request.

2. V_{BR} is measured with a pulse test current I_T at an ambient temperature of 25°C .

3. Surge current waveform per Figure.

Equivalent Circuit Diagram



Typical Characteristics (T_A = 25°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 |
| I _F | Forward Current |
| V _F | Forward Voltage @ I _F |
| P _{PK} | Peak Power Dissipation |
| C | Max. Capacitance @ V _R = 0 and f = 1 MHz |

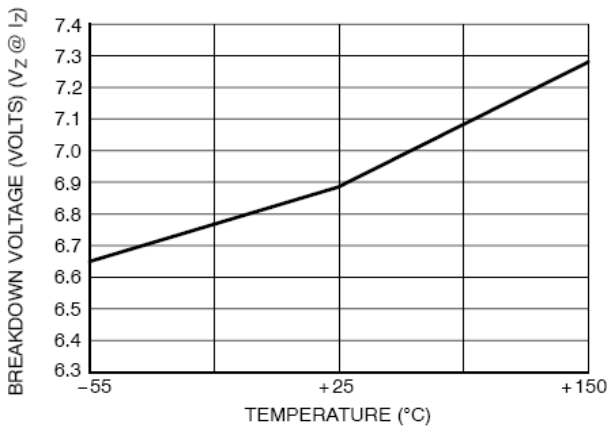
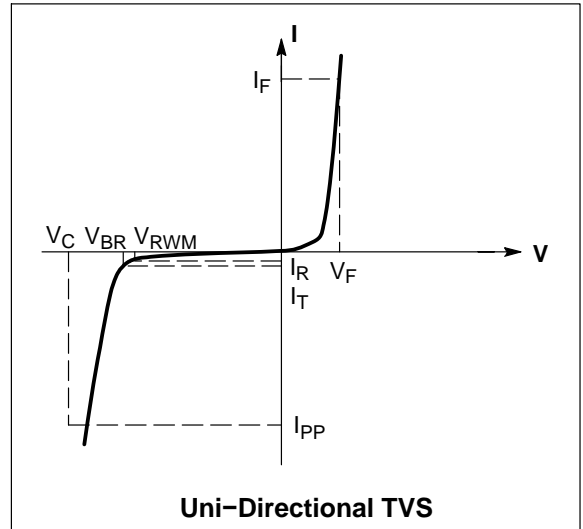


Figure 1. Typical Breakdown Voltage versus Temperature

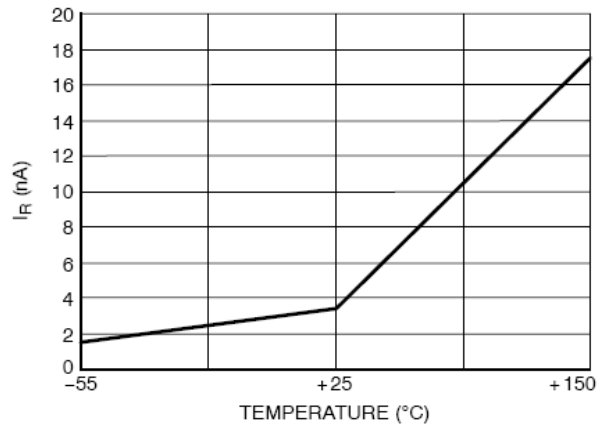


Fig 2. Typical Leakage Current versus Temperature

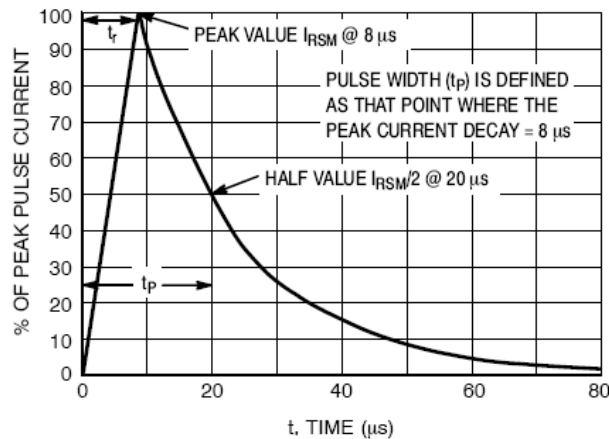


Figure 3. 8*20 μs Pulse Waveform

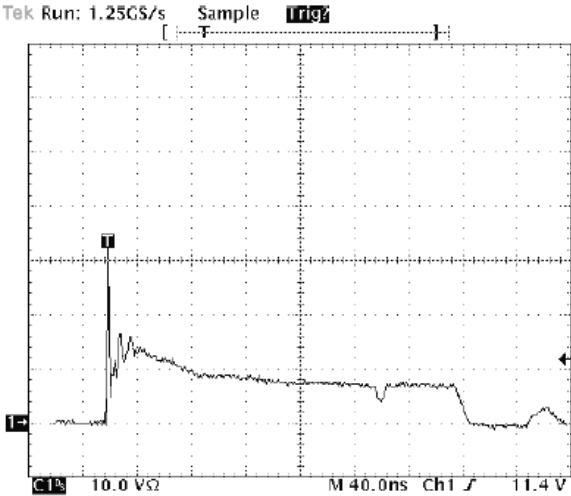


Figure 4. Positive 8kV contact per IEC 61000-4-2-ESD9D5.0

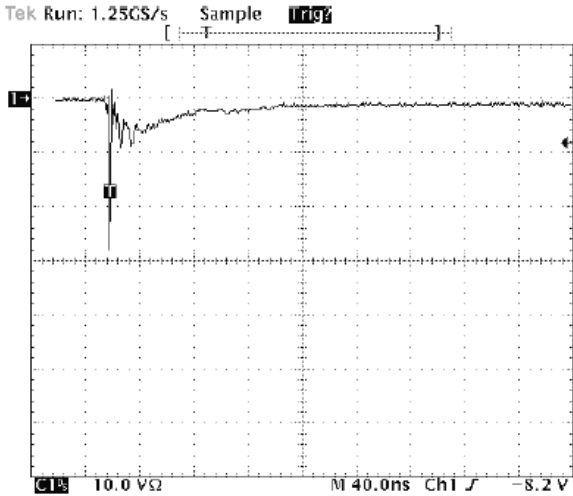


Fig 5. Negative 8kV contact per IEC 61000-4-2-ESD9D5.0