

Features

- 160W peak pulse power (8/20 μ s)
- Protects two bi-directional lines
- Ultra low leakage: nA level
- Operating voltage: 27V
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: \pm 30kV
 - Contact discharge: \pm 30kV
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 4A (8/20 μ s)
- RoHS Compliant
- AEC-Q101 qualified

Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC
- CAN BUS PROTECTION

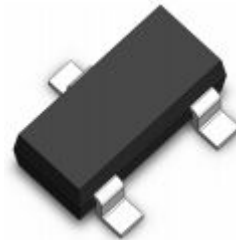
Mechanical Characteristics

- Package: SOT-23
- Lead Finish: Lead Free
- UL Flammability Classification Rating 94V-0
- Quantity Per Reel:3,000pcs
- Reel Size:7inch
- Device Marking: SCH

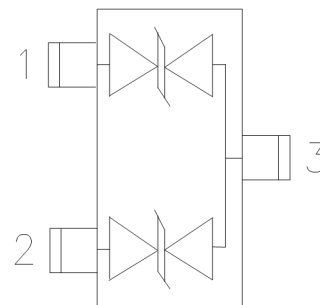
Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---------------------------------|--------|-------------|------|
| Peak Pulse Power (8/20 μ s) | Ppk | 160 | W |
| ESD per IEC 61000-4-2 (Air) | VESD | \pm 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | \pm 30 | |
| Operating Temperature Range | TJ | -55 to +125 | °C |
| Storage Temperature Range | Tstg | -55 to +150 | °C |

Dimensions SOT-23



Pin Configuration



Electrical Characteristics (TA=25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|-------------------------|------------------|--|-----|-----|-----|------|
| Reverse Working Voltage | V _{RWM} | | | | 27 | V |
| Breakdown Voltage | V _{BR} | I _T = 1mA | 28 | | | V |
| Reverse Leakage Current | I _R | V _{RWM} = 27V | | | 0.1 | μA |
| Clamping Voltage | V _C | I _{PP} = 1A (8 x 20μs pulse) | | | 33 | V |
| Clamping Voltage | V _C | I _{PP} = 4A (8 x 20 μs pulse) | | | 40 | V |
| Junction Capacitance | C _J | V _R = 0V, f = 1MHz | | 12 | | pF |

Characteristic Curves

Figure 1. 8 x 20 μ s Waveform

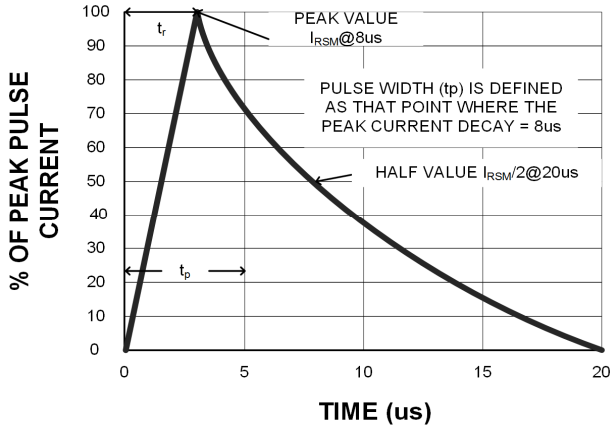


Figure 2. Power Derating Curve

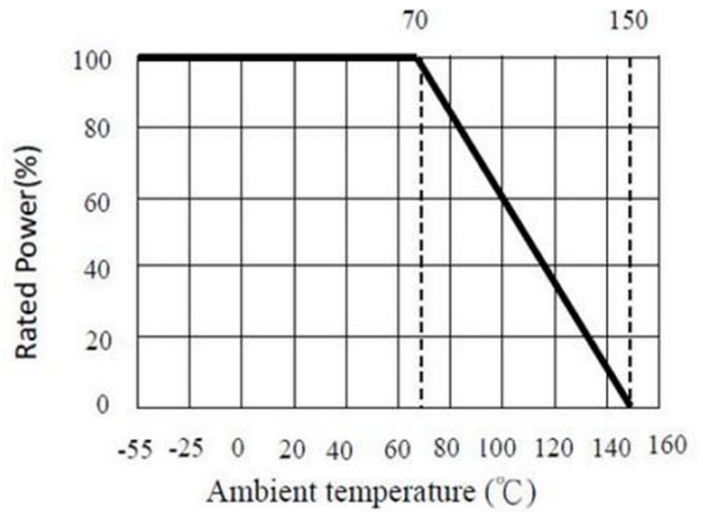


Figure 3. Clamping Voltage vs. Peak Pulse Current ($t_p=8/20 \mu$ s)

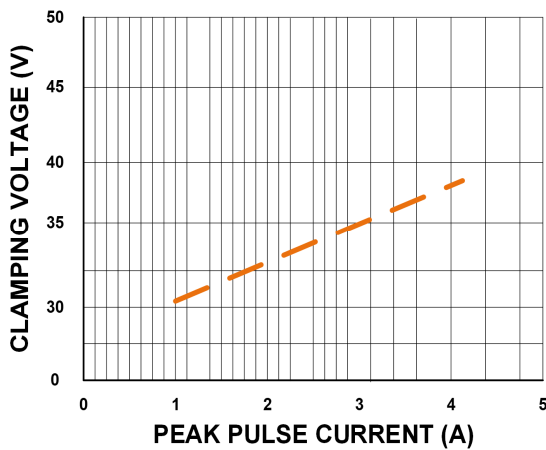


Figure 4. Typical Breakdown Voltage vs. Temperature

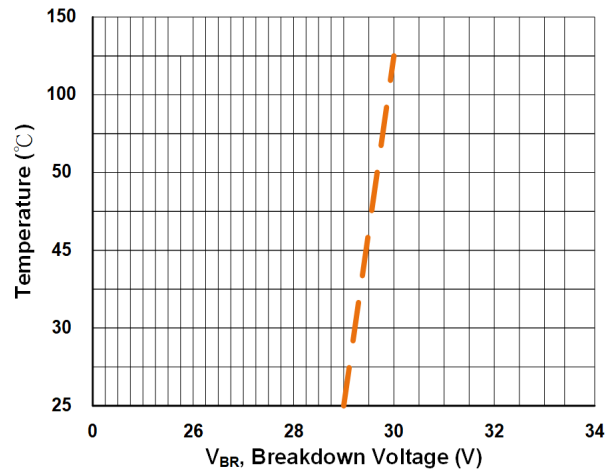


Figure 5. Typical Reverse Current vs. Temperature

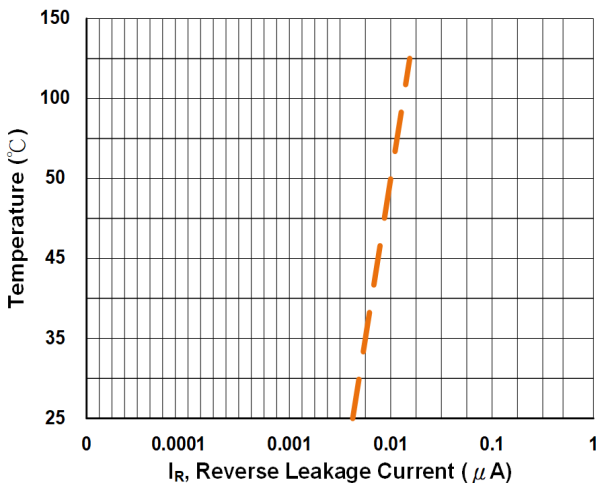
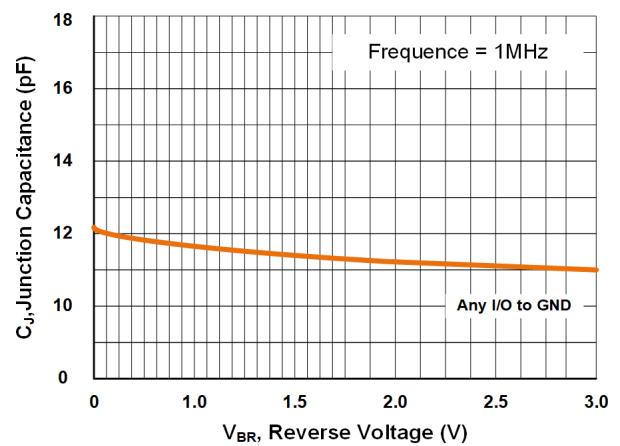


Figure 6. Typical Capacitance vs. Reverse Voltage



APPLICATION INFORMATION

Figure 7. Layout Guidelines

Steps must be taken for proper placement and signal trace routing of the ESD protection device in order to ensure the maximum ESD survivability and signal integrity for the application. Such steps are listed below.

1. Place the ESD protection device as close as possible to the I/O connector to reduce the ESD path to ground and improve the protection performance.

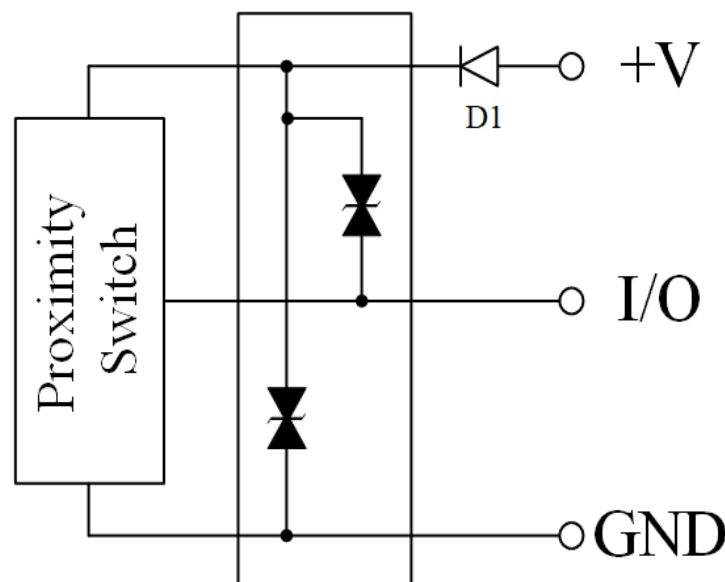
1.1. In USB 3.0/3.1 applications, the ESD protection device should be placed between the AC coupling capacitors and the I/O connector on the TX differential lanes as shown in below drawing In this configuration, no DC current can flow through the ESD protection device preventing any potential latch-up condition. For more information on latchup considerations, see below description on below drawing.

2. Make sure to use differential design methodology and impedance matching of all high speed signal traces.

2.1. Use curved traces when possible to avoid unwanted reflections.

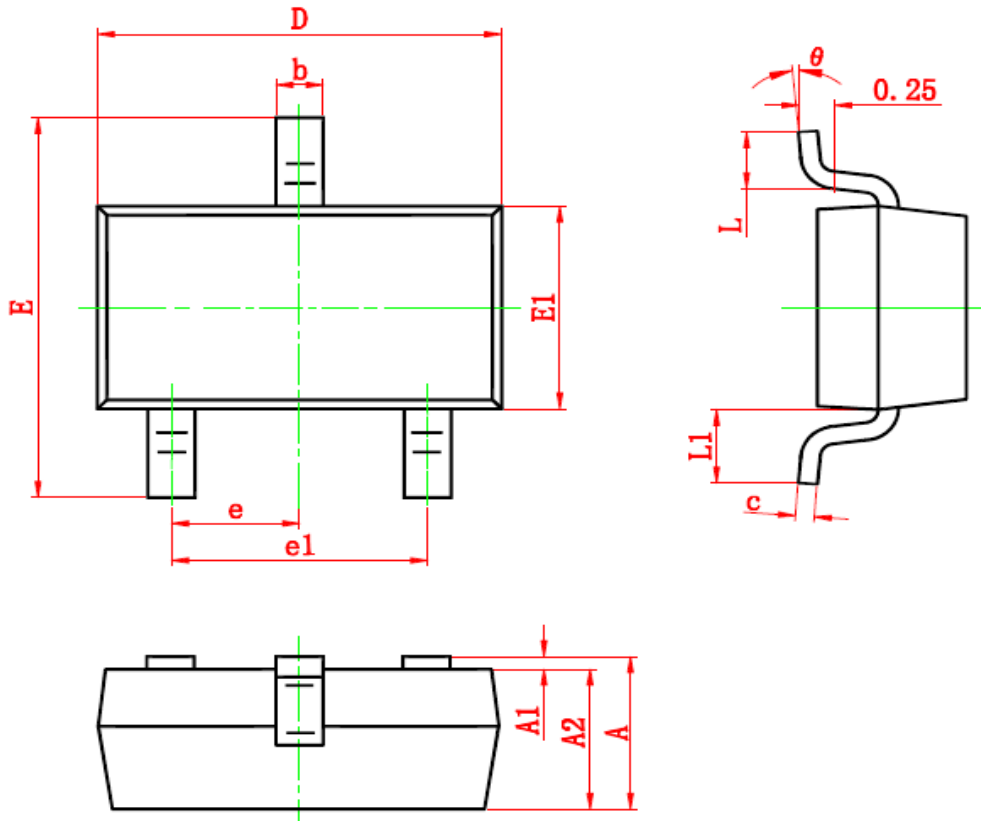
2.2. Keep the trace lengths equal between the positive and negative lines of the differential data lanes to avoid common mode noise generation and impedance mismatch.

2.3. Place grounds between high speed pairs and keep as much distance between pairs as possible to reduce crosstalk.



3-Wire Sensor Circuit Protection

SOT-23 Package Outline & Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 2.250 | 2.550 | 0.089 | 0.100 |
| E1 | 1.200 | 1.400 | 0.047 | 0.055 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.500 | 0.012 | 0.020 |
| L1 | 0.550 REF. | | 0.022 REF. | |
| θ | 0° | 8° | 0° | 8° |

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