

STEERING DIODE / TVS ARRAY COMBO

APPLICATIONS

- ✓ Ethernet - 10/100 Base T
- ✓ Computer I/O Ports - SCSI, FireWire & USB
- ✓ Set-Top Box Protection
- ✓ Video Card

IEC COMPATIBILITY (EN61000-4)

- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 24A, 8/20 μ s - Level 2(Line-Gnd) & Level 3(Line-Line)

FEATURES

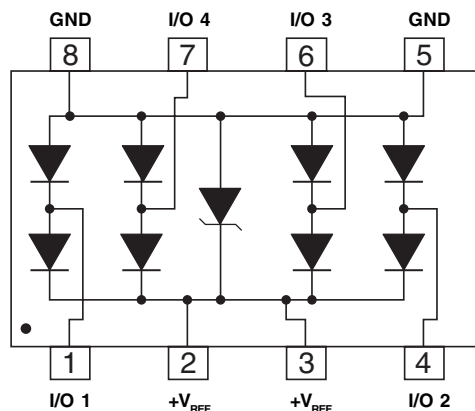
- ✓ 500 Watts Peak Pulse Power per Line (tp=8/20 μ s)
- ✓ Unidirectional Configuration
- ✓ Available in 4 Voltage Types: 3.3V to 15V
- ✓ Protects Up to Four (4) I/O Ports
- ✓ ESD Protection > 40 kilovolts
- ✓ **LOW CAPACITANCE: 15pF**
- ✓ RoHS Compliant in Lead-Free Versions

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SO-8 Package
- ✓ Weight 70 milligrams (Approximate)
- ✓ Available in Tin-Lead or Lead-Free Pure-Tin Plating(Annealed)
- ✓ Solder Reflow Temperature:
 - Tin-Lead - Sn/Pb, 85/15: 240-245°C
 - Pure-Tin - Sn, 100: 260-270°C
- ✓ Flammability Rating UL 94V-0
- ✓ 12mm Tape and Reel Per EIA Standard 481
- ✓ Marking: Logo, Marking Code, Date Code & Pin One Defined By Dot on Top of Package



PIN CONFIGURATION



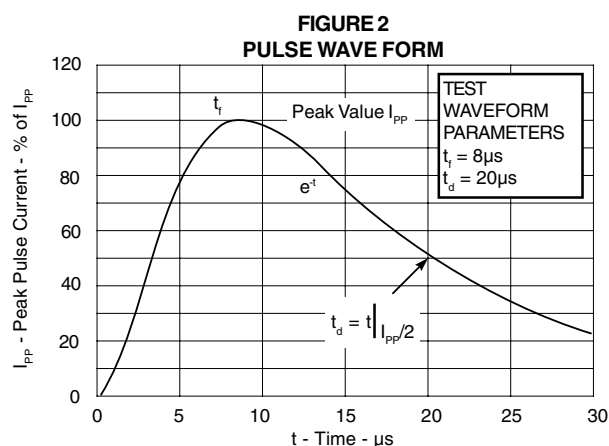
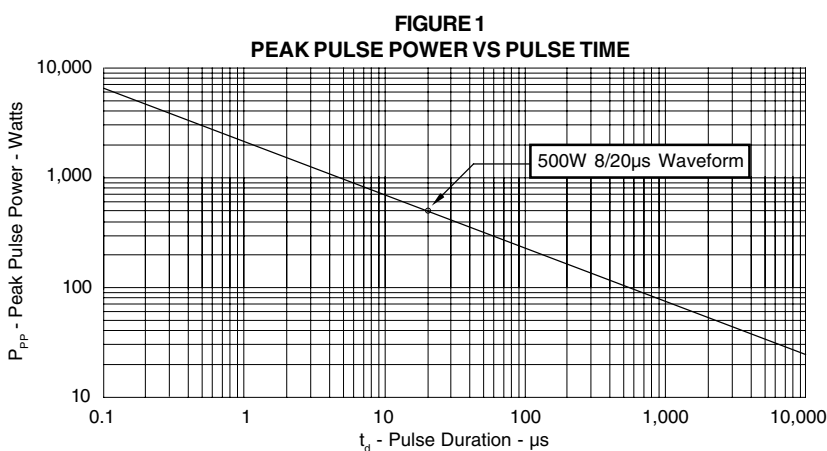
DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified | | | |
|---|-----------|----------------|-------|
| PARAMETER | SYMBOL | VALUE | UNITS |
| Peak Pulse Power ($t_p = 8/20\mu s$) - See Figure 1 | P_{PP} | 500 | Watts |
| Operating Temperature | T_J | -55°C to 150°C | °C |
| Storage Temperature | T_{STG} | -55°C to 150°C | °C |
| Maximum Forward Voltage @ 100mA (See Note 1) | V_F | 1.1 | Volts |

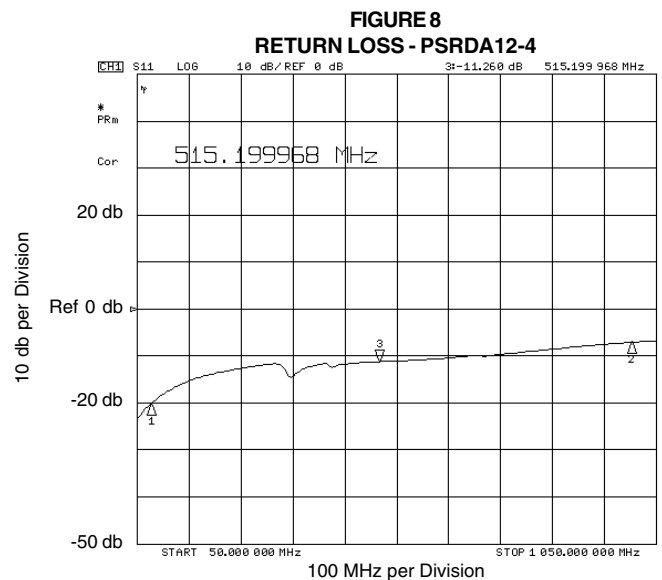
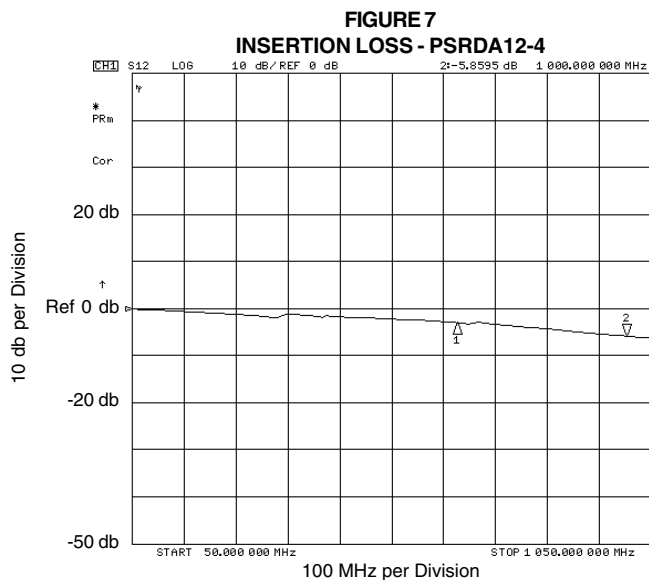
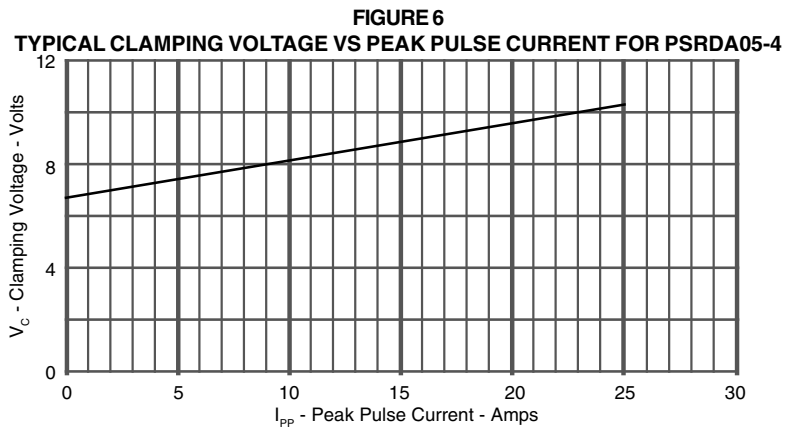
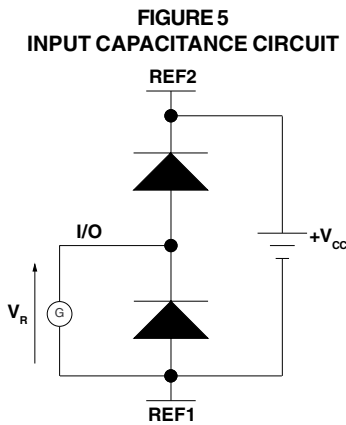
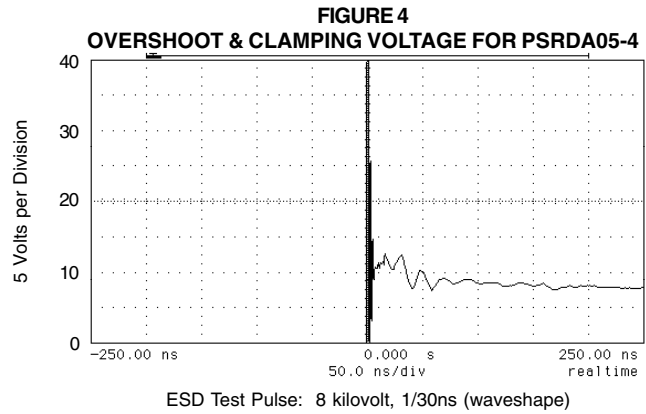
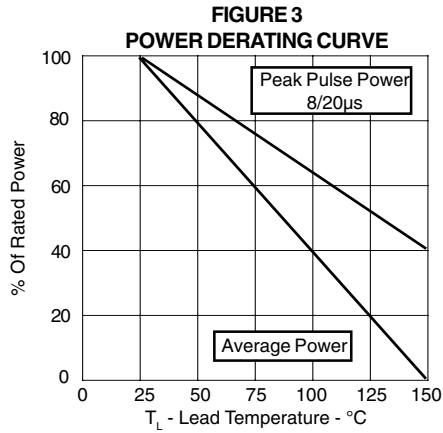
Note 1: Measured between pins 8 or 5 to 1, 2, 3, 4, 6 and 7.

| ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified | | | | | | | |
|---|----------------|-------------------------|------------------------------|---------------------------------------|---------------------------------------|--------------------------------|---|
| PART NUMBER | DEVICE MARKING | RATED STAND-OFF VOLTAGE | MINIMUM BREAKDOWN VOLTAGE | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) | MAXIMUM LEAKAGE CURRENT | MAXIMUM CAPACITANCE (See Note 1) (See Figure 5) |
| | | V_{WM} VOLTS | @ 1mA $V_{(BR)}$ VOLTS | @ $I_P = 1A$ V_C VOLTS | @ 8/20 μs $V_C @ I_{PP}$ | @ V_{WM} I_D μA | @ 0V, 1 MHz $C_{(SD)}$ pF |
| PSRDA3.3-4 | PRA | 3.3 | 4.0 | 6.5 | 10.9V @ 43.0A | 125 | 15 |
| PSRDA05-4 | PRB | 5.0 | 6.0 | 9.8 | 13.5V @ 42.0A | 20 | 15 |
| PSRDA12-4 | PRD | 12.0 | 13.3 | 19.0 | 25.9V @ 21.0A | 1 | 15 |
| PSRDA15-4 | PRE | 15.0 | 16.7 | 24.0 | 30.0V @ 17.0A | 1 | 15 |

Note 1: Capacitance measured at $V_{WM} = V_{CC}$ connected between I/O pins to pin 8 and 5 (Gnd). $V_R = V_{WM}$ @ 1MHz. As shown in Figure 5, REF1 is connected to ground, REF2 is connected to $+V_{CC}$, and input applies to $V_{CC} = 5V$, $V_{sign} = mV$, $F = 1$ MHz.



GRAPHS



APPLICATION NOTE

The PSRDAXx-4 Series are low capacitance, unidirectional TVS arrays that are designed to protect I/O or high speed data lines from the damaging effects of ESD or EFT. This product series has a surge capability of 500 Watts P_{PP} per line for an 8/20 μ s waveshape and offers ESD protection > 40kV.

DIFFERENTIAL-MODE CONFIGURATION (Figure 1)

Ideal for use in USB applications, the PSRDAXx-4 Series provides up to four (4) lines of protection in a differential-mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✓ Pins 1, 4, 6 and 7 are connected to the data lines.
- ✓ Pins 5 and 8 are connected to ground.
- ✓ Pins 2 and 3 are connected to the databus.

DIFFERENTIAL-MODE CONFIGURATION (Figure 2)

The PSRDAXx-4 Series also provides up to four (4) lines of protection in a differential-mode configuration as depicted in Figure 2 for T1/E1 applications.

Circuit connectivity is as follows:

- ✓ Pins 1, 4, 6 and 7 are connected to the data lines.
- ✓ Pins 5 and 8 are connected to ground.
- ✓ Pins 2 and 3 are connected to the databus.

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.

Figure 1. Typical Differential-Mode USB Protection

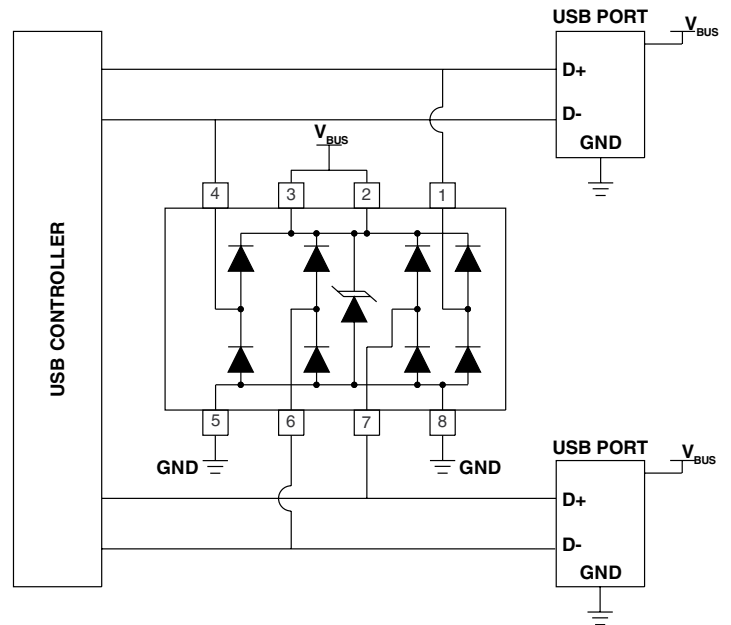
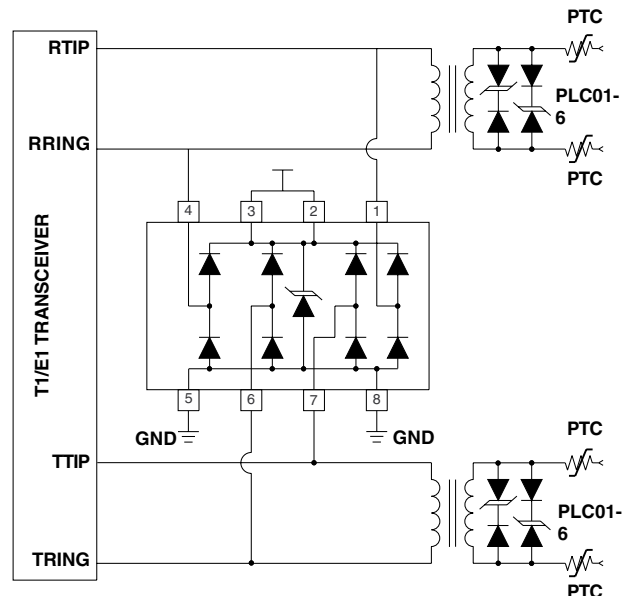
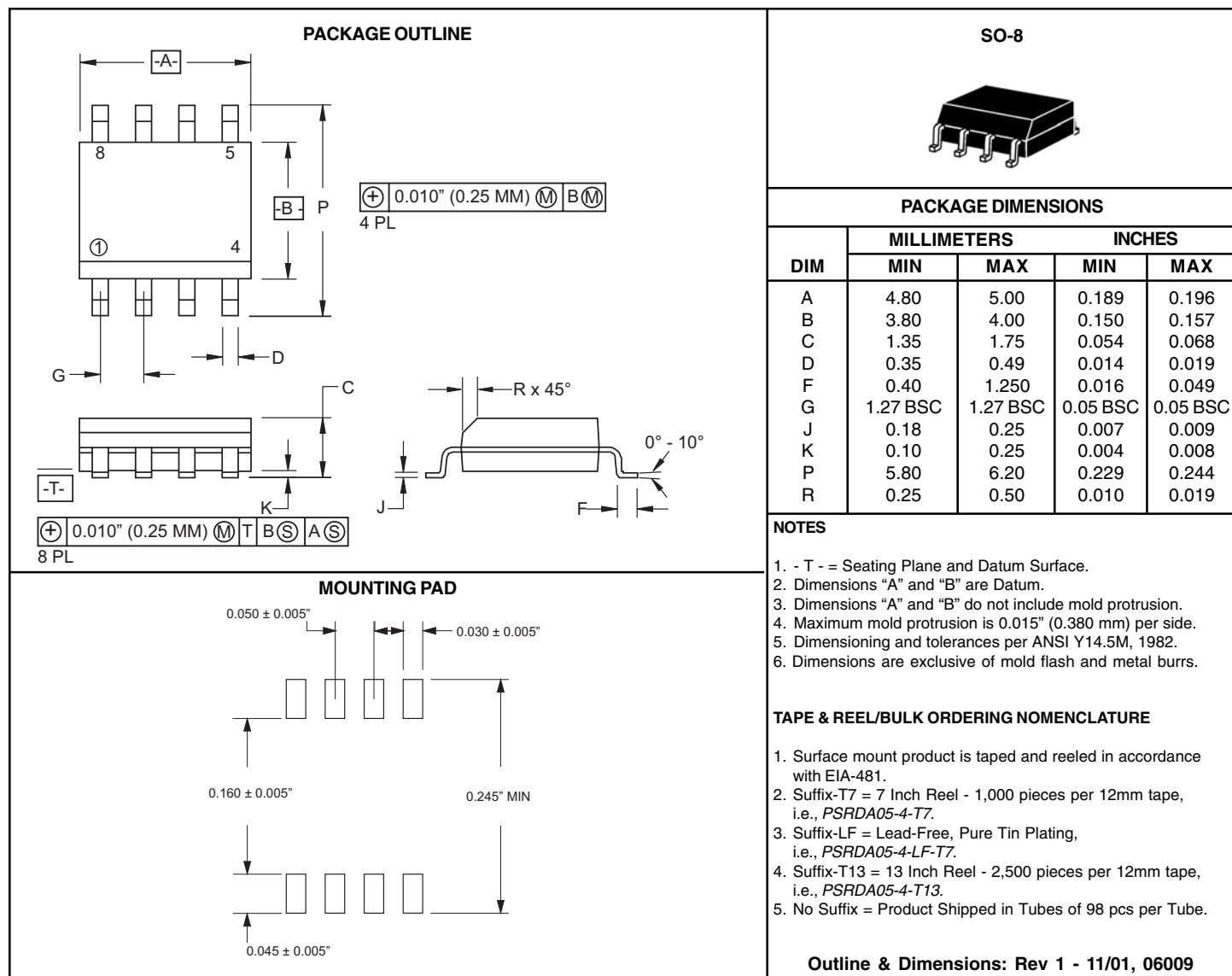


Figure 2. Typical Differential-Mode T1/E1 Protection



PACKAGE OUTLINE & DIMENSIONS



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