

BIDIRECTIONAL LOW CAPACITANCE TVS ARRAYS

APPLICATIONS

- ✓ Ethernet - 10/100 Base T
- ✓ FireWire, SCSI & USB
- ✓ Audio/Video Inputs
- ✓ xDSL Interfaces
- ✓ Cellular Phone Terminals

IEC COMPATIBILITY (EN61000-4)

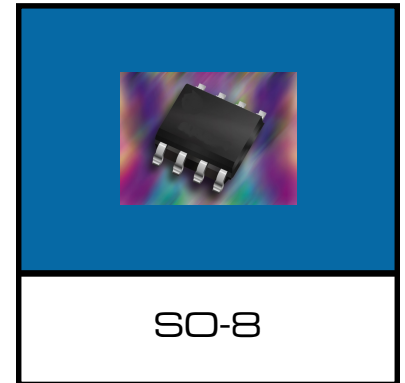
- ✓ 61000-4-2 (ESD): Air - 15kv, Contact - 8kv
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 24A, 8/20 μ s - Level 2(Line-Gnd) & Level 3(Line-Line)

FEATURES

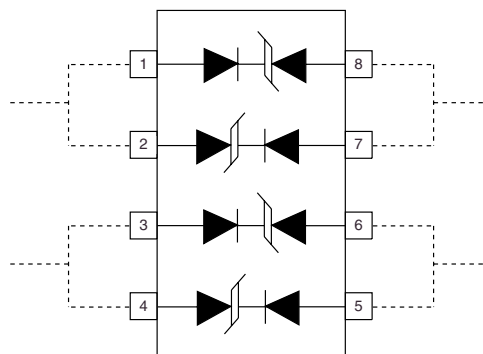
- ✓ 500 Watts Peak Pulse Power Dissipation($t_p = 8/20\mu$ s)
- ✓ Bidirectional Configuration
- ✓ Available in 6 Voltage Types: 3.3V to 24V
- ✓ Protects Up to Two (2) Lines
- ✓ ESD Protection > 40 kilovolts
- ✓ **LOW CAPACITANCE -5pF**

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SO-8
- ✓ Weight 15 milligrams (Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ 12mm Tape and Reel Per EIA Standard 481-1-A
- ✓ Device Marking Code & Logo
- ✓ Pin 1 Indicated By Dot on Package



CIRCUIT DIAGRAM



Note 1: For bidirectional applications, connect external pins 1 & 2, 3 & 4, 5 & 6 and 7 & 8 as shown in the circuit diagram.

Note 2: Do not surge from pins 8 to 1, 2 to 7, 6 to 3, and 4 to 5. PIV typically greater than 100V for each rectifier die.

DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

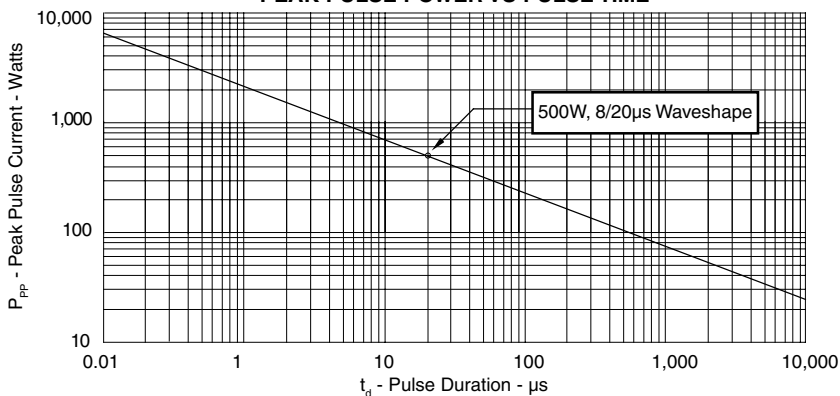
PART NUMBER (See Note 1) (See Note 2)	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_P = 1A$ V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ 8/20μs $V_C @ I_{PP}$	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA	MAXIMUM CAPACITANCE (See Note 3) 0V @ 1 MHz C pF
PLCDA03	SGA	3.3	4.5	7.0	10.9V @ 43.0A	125	5
PLCDA05	SGB	5.0	6.0	9.8	13.5V @ 42.0A	20	5
PLCDA08	SGF	8.0	8.5	13.4	16.0V @ 34.0A	10	5
PLCDA12	SGC	12.0	13.3	19.0	25.9V @ 21.0A	1	5
PLCDA15	SGD	15.0	16.7	24.0	30.0V @ 17.0A	1	5
PLCDA24	SGE	24.0	26.7	43.0	49.0V @ 12.0A	1	5

Note 1: Spice model and parameters for this series are available on the ProTek Devices web site: www.protekdevices.com.

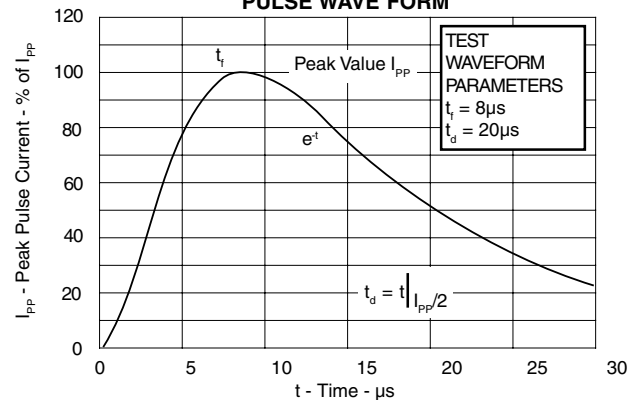
Note 2: Devices are designed to be used in parallel (See Circuit Diagram). For other applications, contact the factory. Do not apply surge in the "forward" direction of the TVS.

Note 3: Do not surge from pins 8 to 1, 2 to 7, 6 to 3 and 4 to 5. PIV typically greater than 100V for each rectifier die. Electrical characteristics apply to pins 1 to 8, 7 to 2, 3 to 6 and 5 to 4.

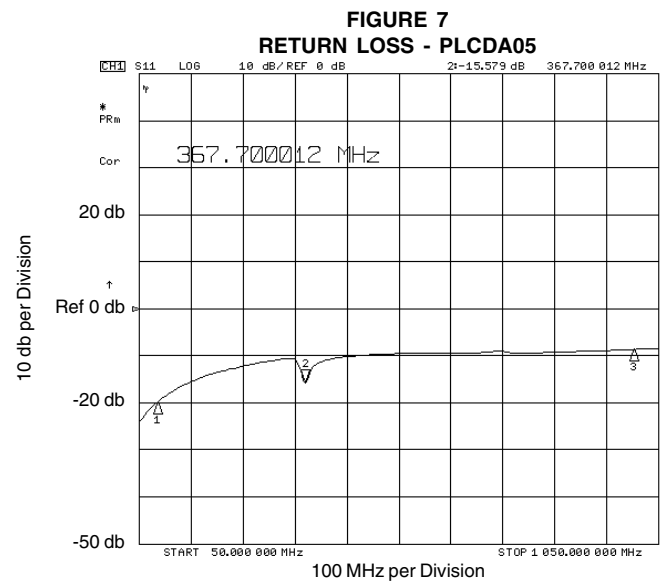
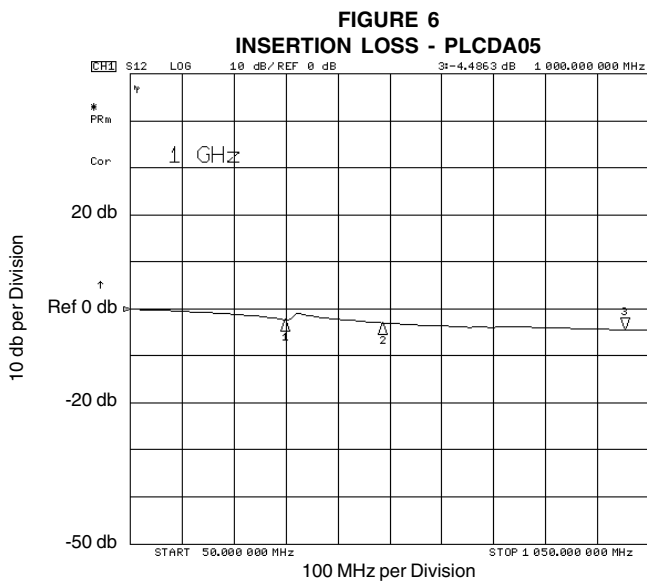
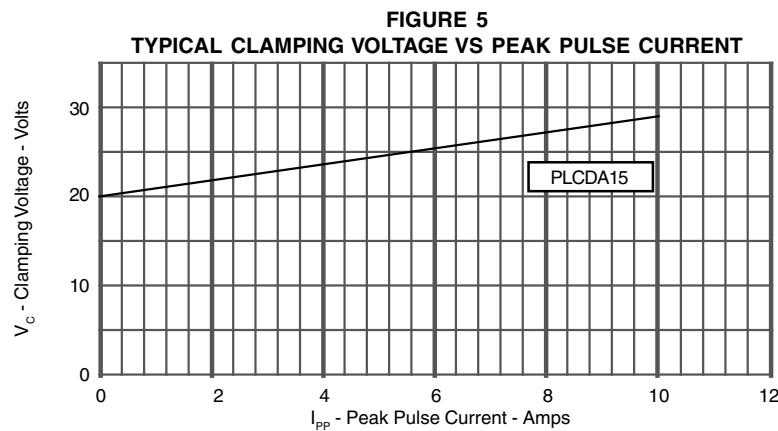
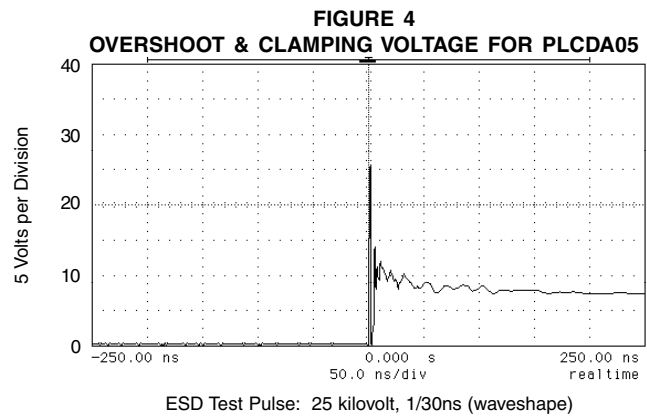
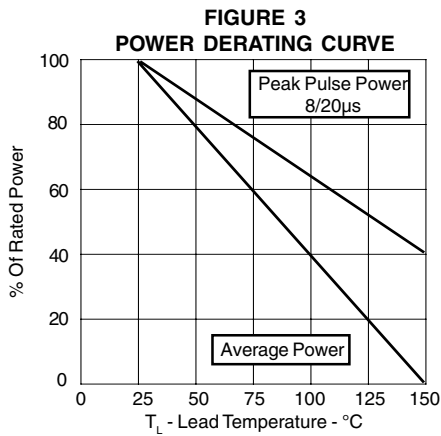
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2
PULSE WAVE FORM**



GRAPHS



APPLICATION NOTE

The PLCDA Series are low capacitance, bidirectional 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.

BIDIRECTIONAL COMMON MODE CONFIGURATION (Figure 1)

Ideal for use in USB applications, the PLCDA Series provides up to two (2) lines of protection in a common mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✓ Pins 1 & 2 and 3 & 4 are connected to Ground.
- ✓ Pins 5 and 6 are connected to I/O Line D+.
- ✓ Pins 7 and 8 are connected to I/O Line D-.

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.

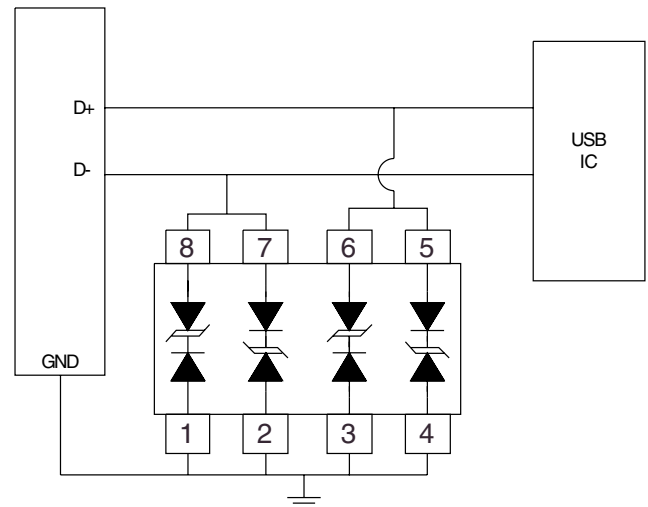
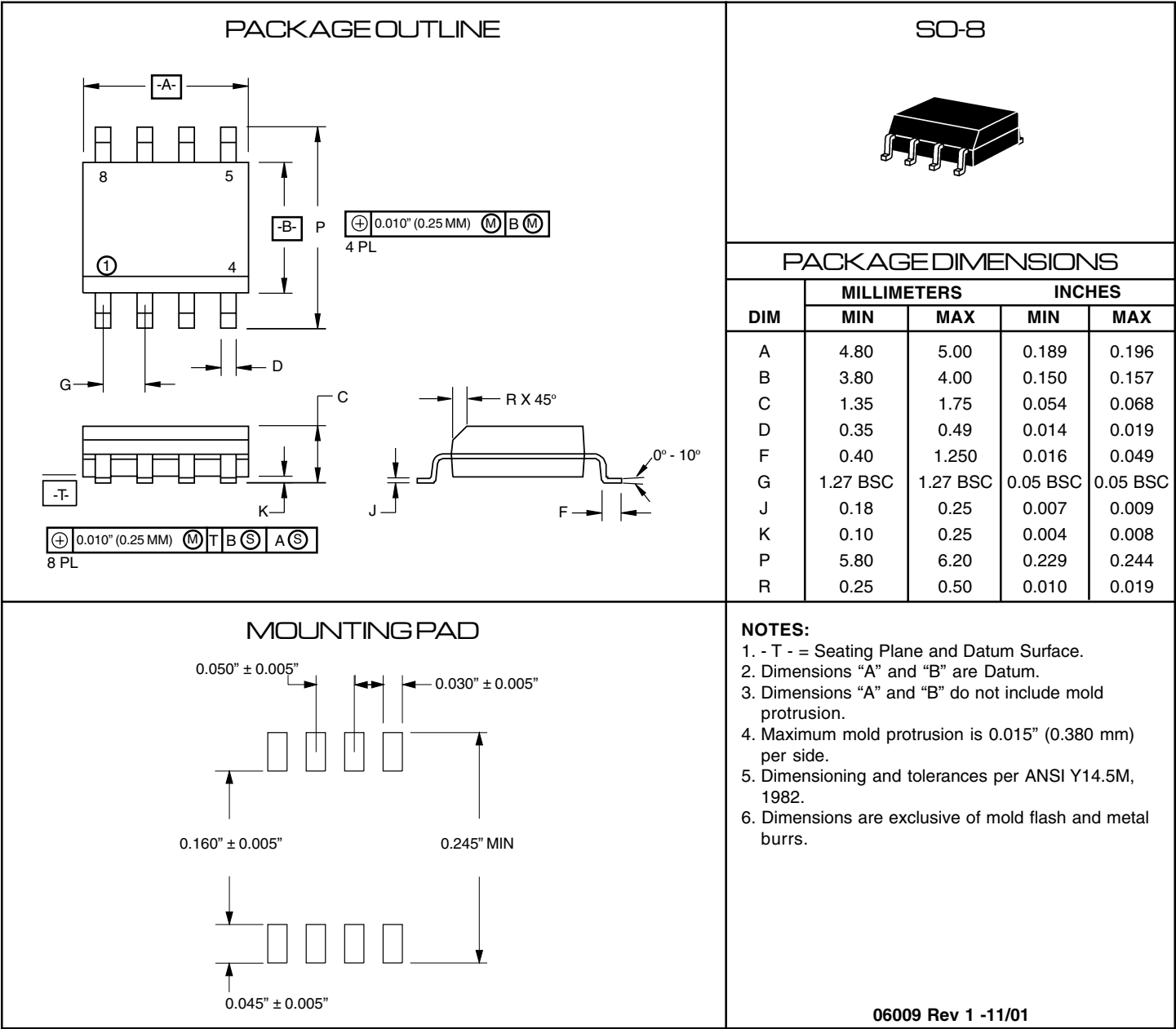


Figure 1. Typical Common-Mode USB Protection Circuit

PACKAGE OUTLINE & DIMENSIONS



TAPE & REEL PACKAGING:
Surface mount product is taped and reeled in accordance with EIA-481, reel quantities and sizes are as follows:
7 Inch Reel - 1,000 pieces per reel; 13 Inch Reel - 2,500 pieces per reel

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