

ULTRA LOW CAPACITANCE TVS ARRAY

APPLICATIONS

- ✓ Sensor & Control Circuits
- ✓ FireWire
- ✓ Ethernet - 10/100/1000 Base T
- ✓ Handheld Electronics
- ✓ RF Applications

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-Ground) & Level 3(Line-Line)

FEATURES

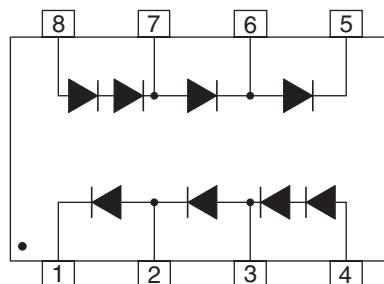
- ✓ 500 Watts Peak Pulse Power per Line ($t_p = 8/20\mu$ s)
- ✓ Bidirectional Configuration
- ✓ ESD Protection > 40 kilovolts
- ✓ Low Clamping Voltage < 5 Volts
- ✓ Ultra Low Capacitance: 1.25pF
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SO-8
- ✓ Weight 70 milligrams (Approximate)
- ✓ Available in Lead-Free Pure-Tin Plating(Annealed)
- ✓ Solder Reflow Temperature:
 - Pure-Tin - Sn, 100: 260-270°C
- ✓ Consult Factory for Leaded Device Availability
- ✓ 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 (tp = 8/20µs) - See Figure 1	P_{PP}	500	Watts
Operating Temperature	T_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER	DEVICE MARKING CODE	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE (See Note 1) @1mA $V_{(BR)}$ VOLTS	MAXIMUM REVERSE LEAKAGE CURRENT (See Note 1) @ V_{WM} I_D µA	MAXIMUM CLAMPING VOLTAGE (See Note 1) (See Fig. 2) @8/20µs V_C @ I_{PP}	WORKING INVERSE BLOCKING VOLTAGE (See Note 2) V_{WIB} VOLTS	INVERSE BLOCKING LEAKAGE CURRENT (See Note 2) @ V_{WIB} I_R µA	MAXIMUM CAPACITANCE (See Note 3) @0V, 1MHz C pF
PLC496	VEC	1.0	2.5	20	12.5V @ 30A	75	1.0	1.25

Note 1: Apply positive voltage from pin 4 to 1 and pin 8 to 5.

Note 2: Apply positive voltage from pin 1 to 4 and pin 5 to 8.

Note 3: Capacitance from pin 1 to 4 < 1.25pF. Capacitance from pin 8 to 5 < 1.25pF.

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

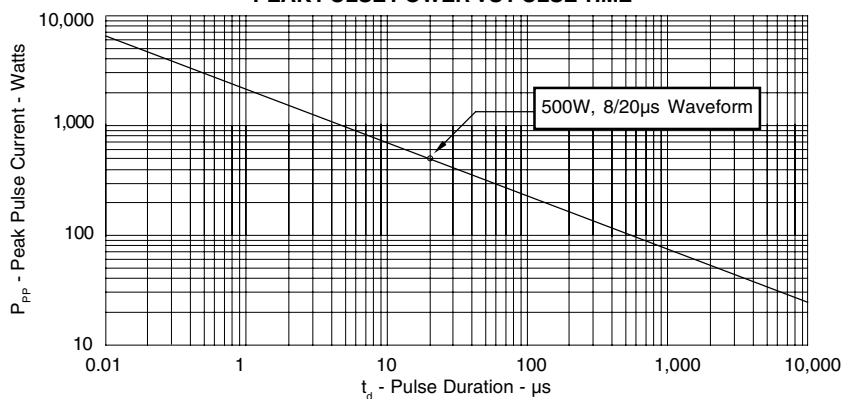
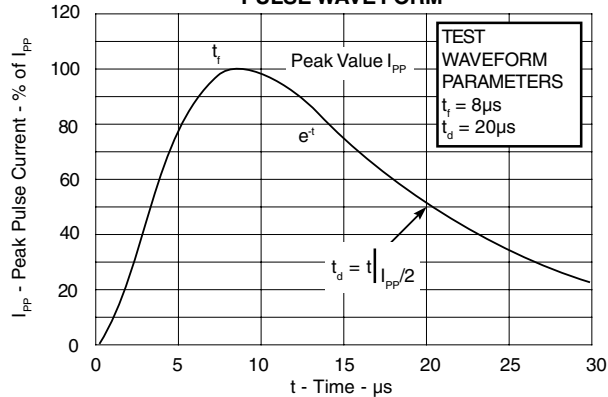
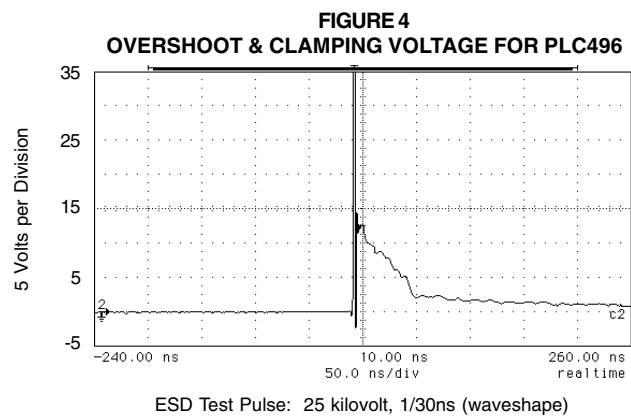
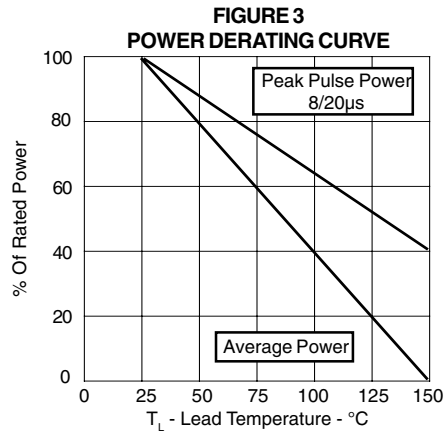


FIGURE 2
PULSE WAVEFORM



GRAPHS



APPLICATION NOTE

The PLC496 is an ultra low capacitance, bidirectional array that is designed to protect I/O or high speed data lines from the damaging effects of ESD or EFT. This product 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)

The PLC496 is designed to protect one bidirectional line where the normal signal voltage is both positive and negative. Figure 1 shows a typical differential-mode line to line) I/O port protection circuit application.

Circuit connectivity is as follows:

- ✓ Pins 1, 4 5 and 8 are connected to the data lines
- ✓ Pins 2, 3, 7 and 6 are not connected.

COMMON-MODE CONFIGURATION (Figure 2)

The PLC496 can provide protection for sensor circuit applications. Figure 2, is a typical common-mode (line to ground) sensor circuit application.

Circuit connectivity is as follows:

- ✓ Pins 1 and 8 connected to the dataline
- ✓ Pins 4 and 5 connected to ground
- ✓ Pins 2, 3, 6, and 7 are not connected

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.

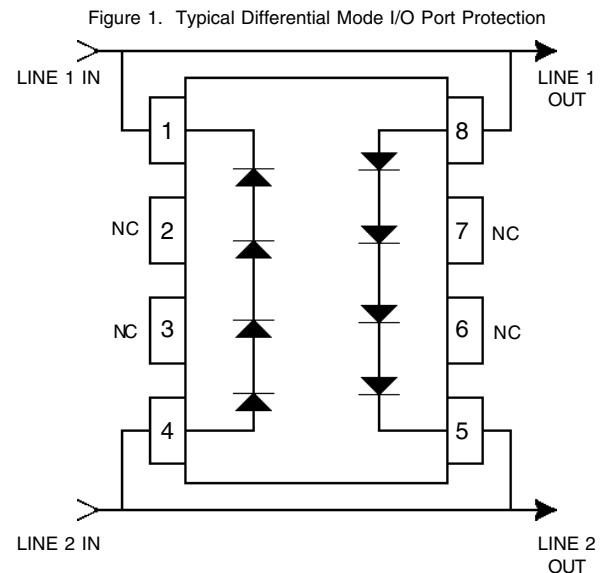
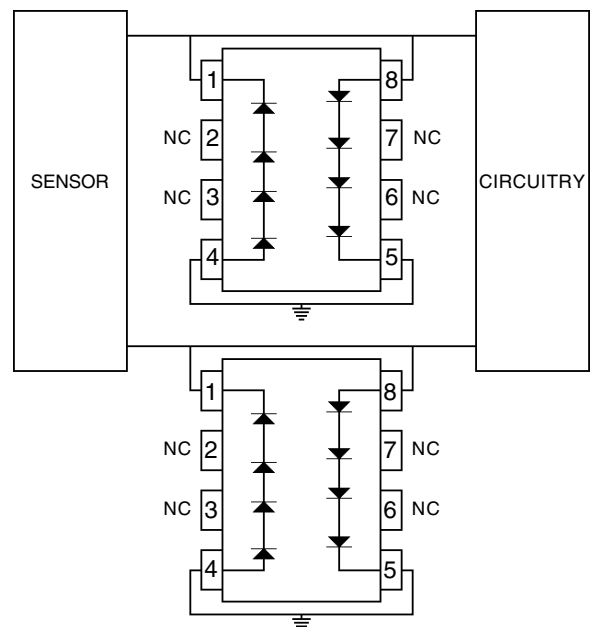
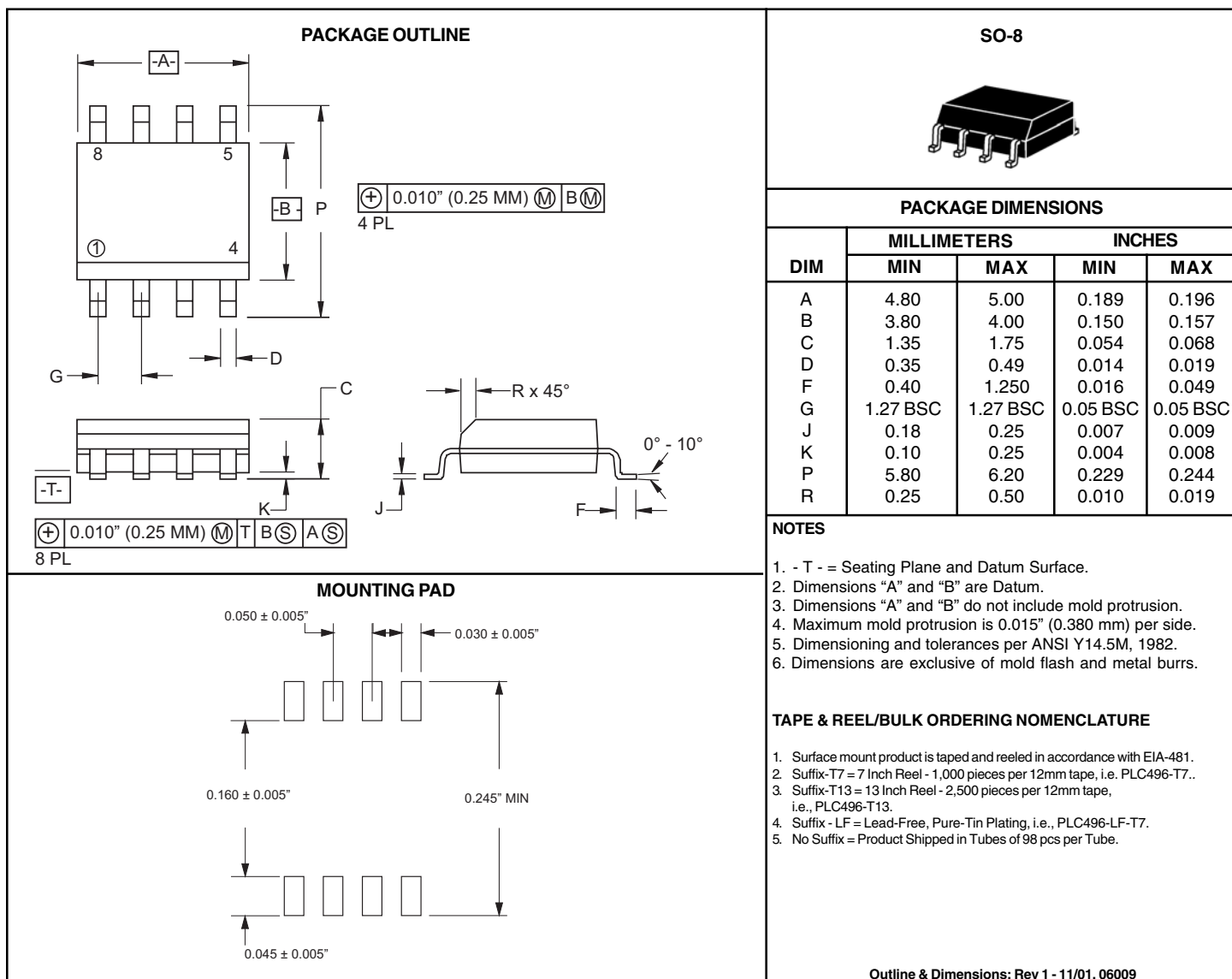


Figure 2. Typical Common Mode Sensor Protection Circuit



PLC496

SO-8 PACKAGE OUTLINE & DIMENSIONS



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