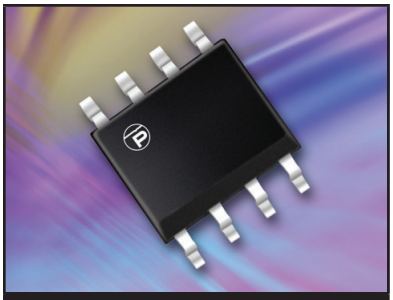
500 WATT ULTRA LOW CAPACITANCE TVS ARRAY



SO-8 PACKAGE

DESCRIPTION

The PLC496 is an ultra low capacitance TVS array that provides two lines of protection. This device protects high-frequency applications such as voice and data related systems and is designed to minimize the effects of high overshoot voltage experienced during and ESD event.

The PLC496 has a peak pulse power rating of 500 Watts for an 8/20µs waveshape. This device meets the IEC 61000-4-2, IEC 61000-4-4 and IEC 61000-4-5 requirements.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20µs - Level 2(Line-Gnd) & Level 3(Line-Line)
- 500 Watts Peak Pulse Power per Line (tp = 8/20µs)
- Bidirectional Configuration
- Low Clamping Voltage < 5 Volts
- Ultra Low Capacitance: 1.25pF
- RoHS Compliant
- REACH Compliant

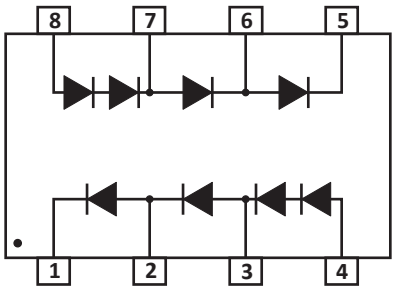
APPLICATIONS

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

MECHANICAL CHARACTERISTICS

- Molded JEDEC SO-8 Package
- Approximate Weight: 70 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
  Pure-Tin - Sn, 100: 260-270°C
- 12mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

PIN CONFIGURATION



TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	T_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Peak Pulse Power (tp = 8/20µs) - See Figure 1	P_{PP}	500	Watts

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE (Note 1) @1mA $V_{(BR)}$ VOLTS	MAXIMUM REVERSE LEAKAGE CURRENT (Note 1) @V_{WM} I_D µA	MAXIMUM CLAMPING VOLTAGE (Note 1) (Fig. 2) @ 8/20µs V_C @ I_{PP}	WORKING INVERSE BLOCKING VOLTAGE (Note 2) @ V_{WB} VOLTS	INVERSE BLOCKING LEAKAGE CURRENT (Note 2) @ V_{WB} I_R µA	MAXIMUM CAPACITANCE (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.
2. Apply positive voltage from pin 1 to 4 and 5 to 8.
3. Capacitance from pin 1 to 4 < 1.25pF. Capacitance from pin 8 to 5 < 1.25pF.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

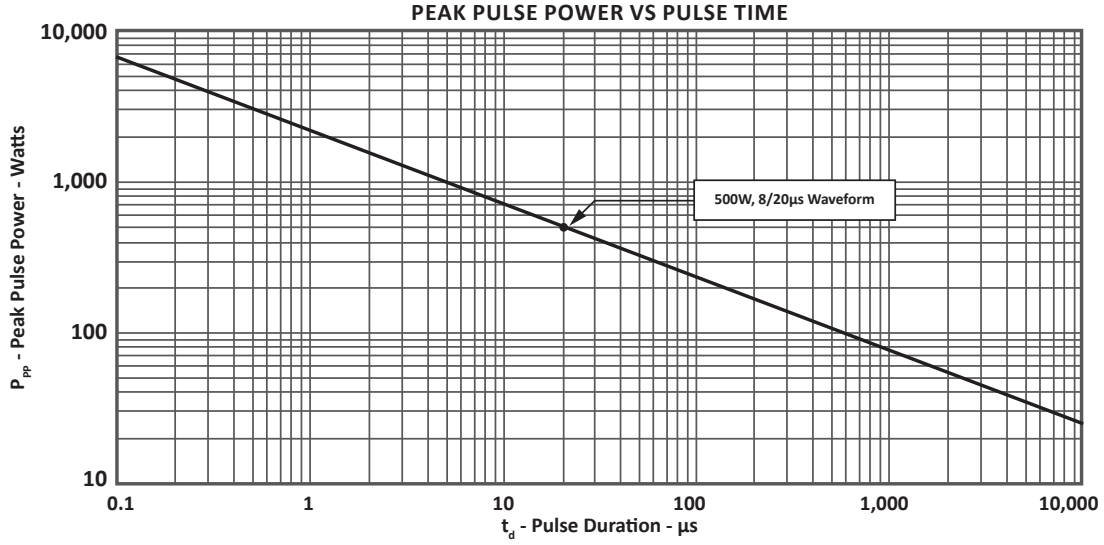
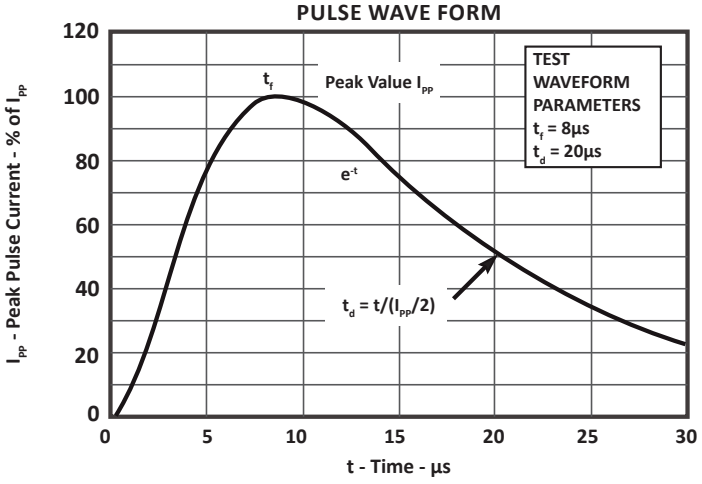


FIGURE 2
PULSE WAVE FORM



TYPICAL DEVICE CHARACTERISTICS

FIGURE 3
POWER DERATING CURVE

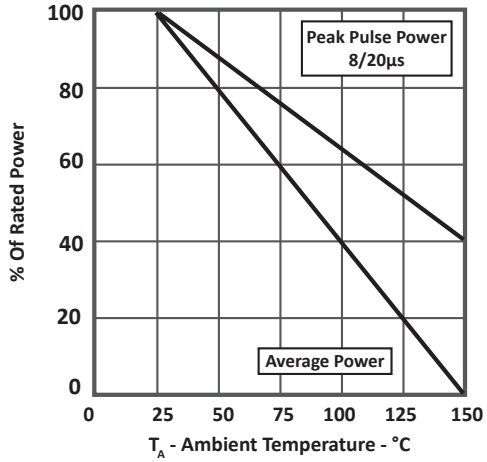
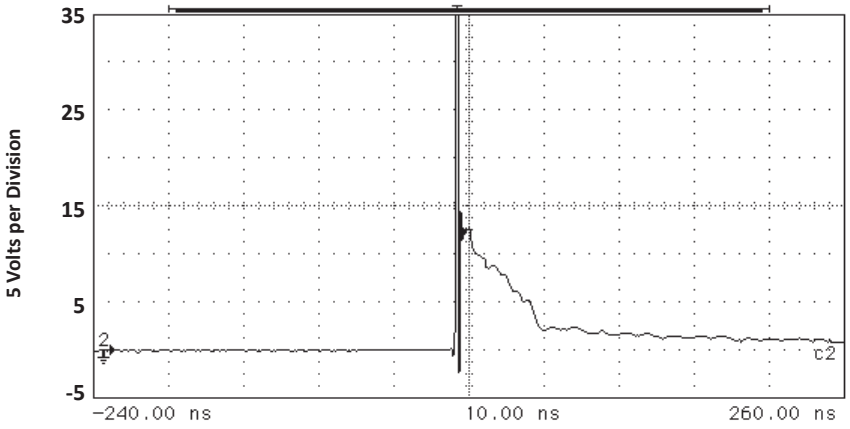


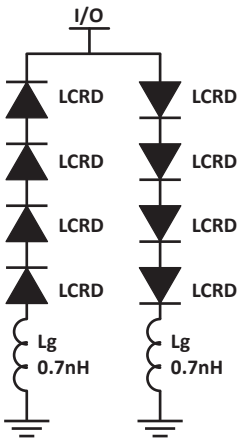
FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE



ESD Test Pulse - 25 kilovolt, 1/30ns (Waveshape)

SPICE MODEL

FIGURE 1
SPICE MODEL



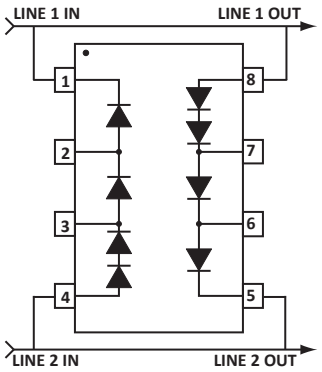
LCRD: Low Capacitance Rectifier Diode
Lg - Lead Inductance

TABLE 1 - SPICE PARAMETERS

PARAMETER	UNIT	LCRD
BV	V	200
IBV	µA	0.01
C_{jo}	pF	5
I_s	A	1E-13
Vj	V	0.6
M	-	0.33
N	-	1
R_s	Ohms	0.31
TT	s	1E-9
EG	eV	1.11

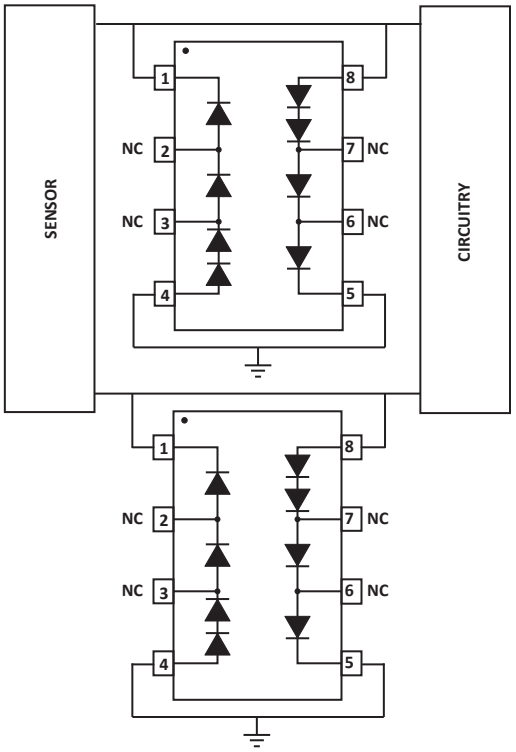
APPLICATION INFORMATION

FIGURE 1 - DIFFERENTIAL MODE I/O PORT PROTECTION



Circuit connectivity is as follows:
- Pins 1, 4, 5 and 8 are connected to the data lines.
- Pins 2, 3, 6 and 7 are not connected.

FIGURE 2 - COMMON MODE SENSOR PROTECTION



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.

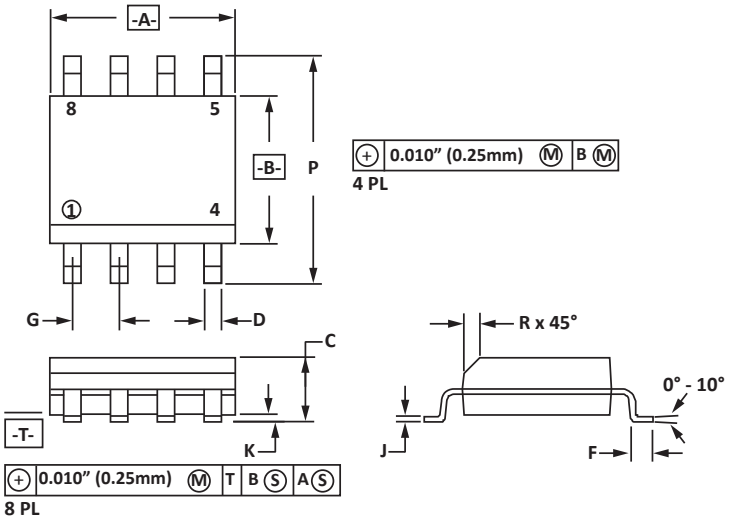
CIRCUIT BOARD RECOMMENDATIONS

Circuit board layout is critical for electromagnetic compatibility 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.

SO-8 PACKAGE INFORMATION

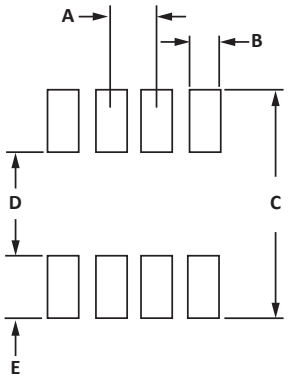
OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.05 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.008
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

NOTES
1. -T- = Seating plane and datum surface.
2. Dimensions "A" and "B" are datum.
3. Dimensions "A" and "B" do not include mold protrusion.
4. Maximum mold protrusion is 0.015" (0.380mm) per side.
5. Dimensioning and tolerances per ANSI Y14.5M, 1982.
6. Dimensions are exclusive of mold flash and metal burrs.

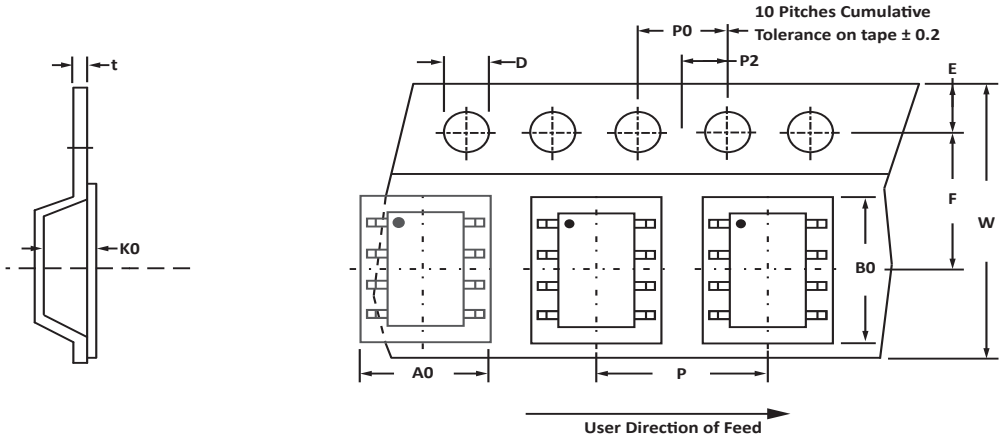


PAD LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.14	1.40	0.045	0.055
B	0.64	0.89	0.025	0.035
C	6.22	-	0.245	-
D	3.94	4.17	0.155	0.165
E	1.02	1.27	0.040	0.050

NOTES
1. Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	12mm	6.50 ± 0.10	5.40 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30	4.00 ± 0.12	2.00 ± 0.10	4.00 ± 0.10	0.25

NOTES
1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T7 = 7" Reel - 1,000 pieces per 12mm tape.
4. Suffix - T13 = 13" Reel - 2,500 pieces per 12mm tape.
5. Bulk product shipped in tubes of 98 pieces per tube.
6. Marking on Part - marking code (see page 2), date code, logo and pin one defined by dot on top of package.

Package outline, pad layout and tape specifications per document number 06009.R3 9/10.

ORDERING INFORMATION					
BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PLC496	-LF	-T7	1,000	7"	98
PLC496	-LF	-T13	2,500	13"	98

This device is only available in a Lead-Free configuration.

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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