

## ULTRA LOW CAPACITANCE STEERING DIODE/TVS ARRAY



**SOT-543 PACKAGE**

### DESCRIPTION

The PLR0502 is an ultra low capacitance (0.6pF) steering diode and TVS array combo. This device provides circuit protection for interfaces and wireless bus applications and portable electronics. The PLR0502 is ideally suited to protect USB(1.0-3.0) data I/O ports against the effects of ESD and EFT.

The PLR0502 meets the requirements of IEC 61000-4-2 (ESD) and IEC 61000-4-4 (EFT). At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. The PLR0502 offers a ultra low capacitance and low leakage current in a SOT-543 package.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- 200 Watts Peak Pulse Power per Line (tp = 8/20µs)
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Unidirectional Configuration
- Protects 2 I/O Ports and Power Supply
- Ultra Low Capacitance: 0.6pF
- RoHS Compliant
- REACH Compliant

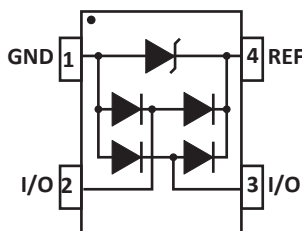
### APPLICATIONS

- Ethernet - 10/100 Base T
- FireWire
- Wireless Communications
- USB 1.0, USB 2.0 & USB 3.0

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SOT-543 Package
- Approximate Weight: 3 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

### PIN CONFIGURATION



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

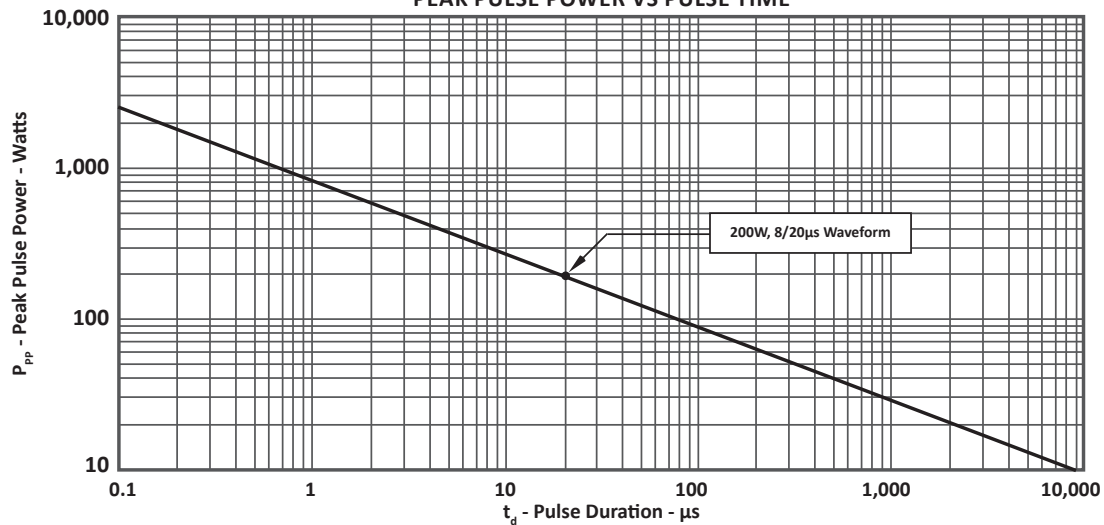
PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_L$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Peak Pulse Power (tp = 8/20µs) - See Figure 1	$P_{PP}$	200	Watts
Peak Forward Voltage - $I_F = 1A$ , 8/20µs	$V_F$	1.5	Volts

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

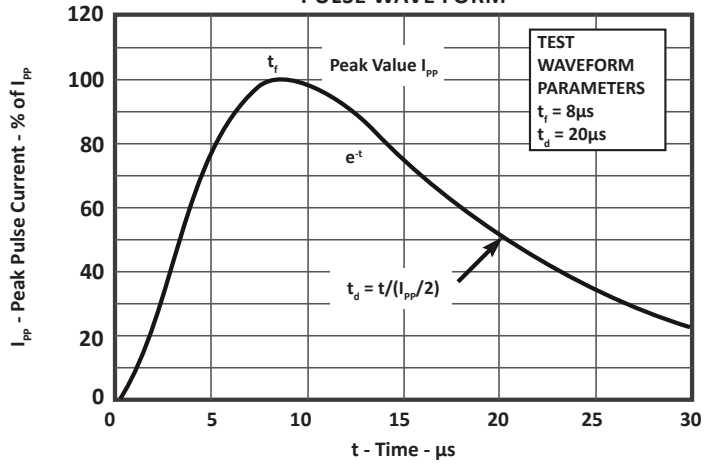
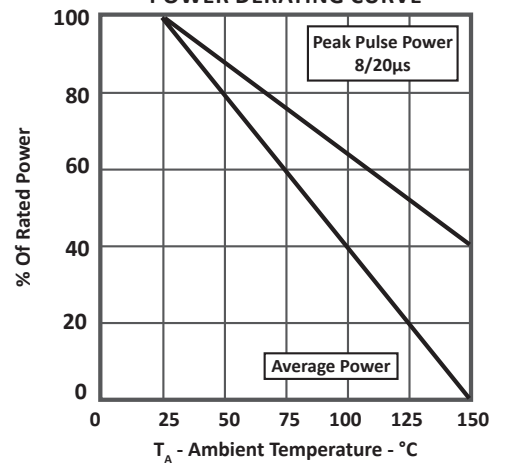
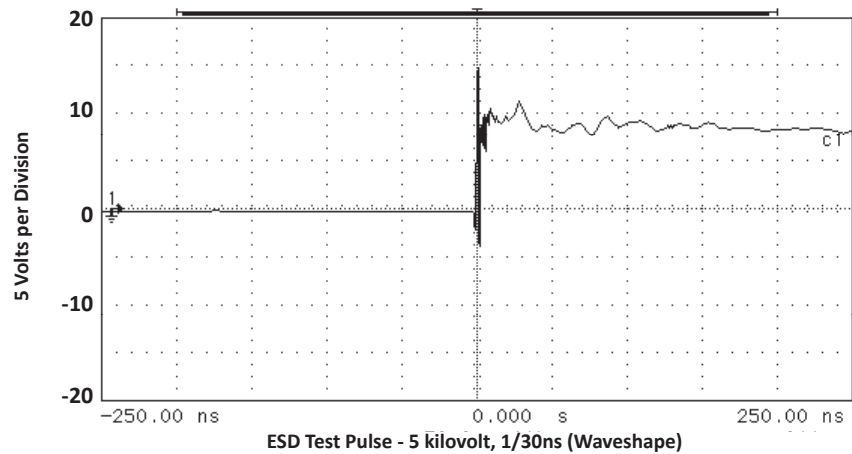
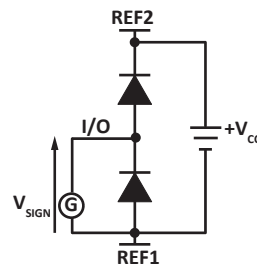
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE  @1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 2) @ $I_P = 1A$ $V_C$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 2) @ 8/20µs $V_C @ I_{PP}$	MAXIMUM LEAKAGE CURRENT  @ $V_{WM}$ $I_D$ µA	MAXIMUM CAPACITANCE (Per Data Line) (Fig. 5) (Note 1) @0V, 1MHz $C_{J(SD)}$ pF
PLR0502	B5	5.0	6.0	9.8	20.0V @ 10.0A	1	0.6

**NOTE**

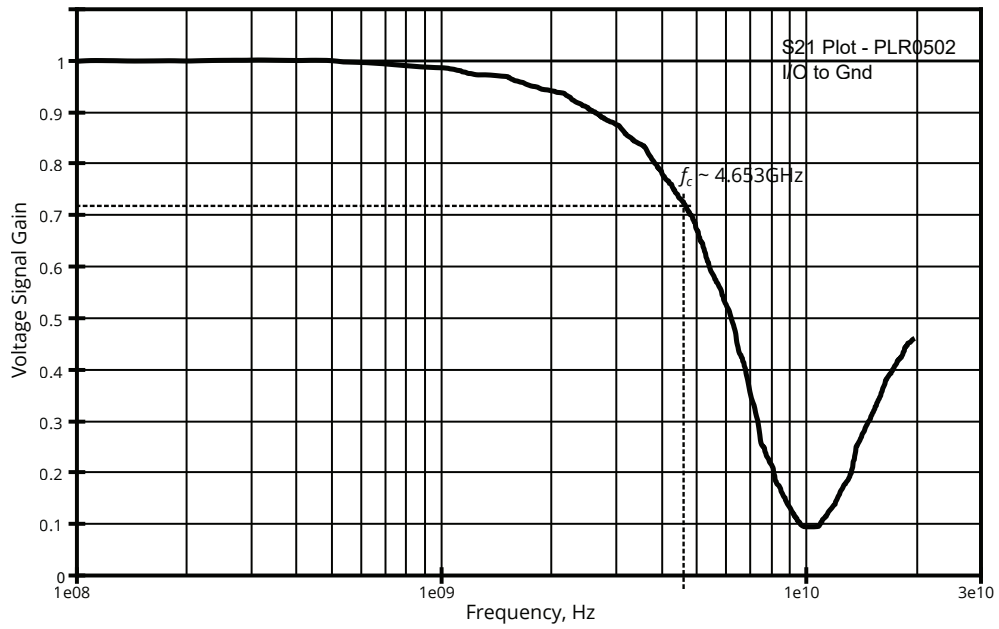
- As shown in Figure 5, REF 1 is connected to ground, REF 2 is connected to + $V_{CC}$  and input applies to  $V_{CC} = 5V$ ,  $V_{SIGN} = 30mV$ ,  $F = 1MHz$ .
- Measured across pin 1 to pin 4.

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


## TYPICAL DEVICE CHARACTERISTICS

**FIGURE 2**  
**PULSE WAVE FORM**

**FIGURE 3**  
**POWER DERATING CURVE**

**FIGURE 4**  
**OVERSHOOT & CLAMPING VOLTAGE**

**FIGURE 5**  
**INPUT CAPACITANCE CIRCUIT**


## TYPICAL DEVICE CHARACTERISTICS

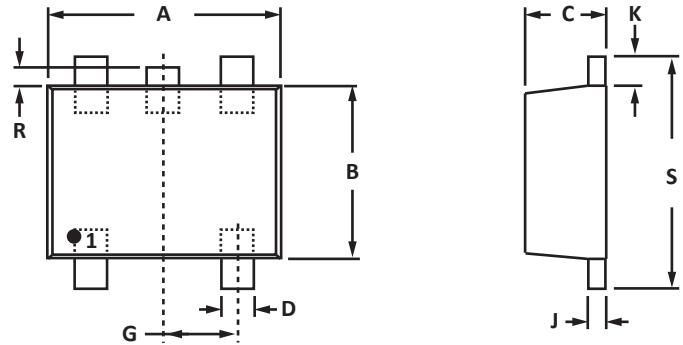
**FIGURE 6**  
**INSERTION LOSS**

**SOT-543 PACKAGE INFORMATION**
**OUTLINE DIMENSIONS**

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.70	0.059	0.067
B	1.10	1.30	0.043	0.051
C	0.50	0.60	0.020	0.024
D	0.17	0.27	0.007	0.011
G	0.50 BSC		0.020 BSC	
J	0.08	0.18	0.003	0.007
K	0.10	0.30	0.004	0.012
S	1.50	1.70	0.059	0.067
R	0.05	0.15	0.002	0.006

**NOTES**

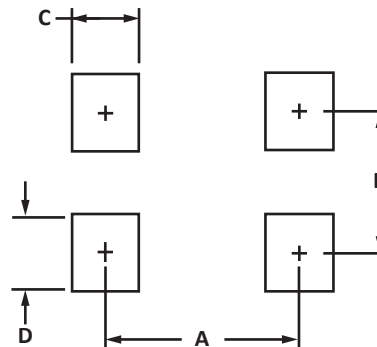
1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Dimensions are exclusive of mold flash and metal burrs.
4. Do not connect center stub.

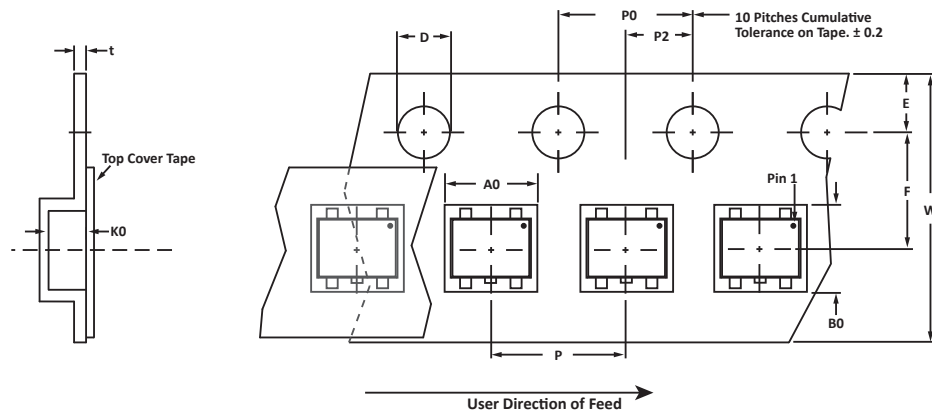

**PAD LAYOUT DIMENSIONS**

DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	1.02	0.040
B	1.20	0.048
C	0.30	0.012
D	0.51	0.020

**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")	8mm	1.78 ± 0.05	1.78 ± 0.05	0.69 ± 0.05	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	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 - 3,000 pieces per 8mm tape.
4. Marking on Part - marking code (see page 2).

Package outline, pad layout and tape specifications per document number 06074.R3 3/11.

**ORDERING INFORMATION**

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PLR0502	-LF	-T7	3,000	7"	n/a

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

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

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