

**ULTRA LOW CAPACITANCE STEERING DIODE/THYRISTOR**



**DFN-10 PACKAGE**

**DESCRIPTION**

The PLRT0504LC is an ultra low capacitance steering diode/Thyristor. This device is designed to protect computing applications such as HDMI, USB (1.0-3.0) and DVI interfaces, as well as telecommunications equipment/systems. The PLRT0504LC is available in a space saving DFN-10 package configuration.

This device meets IEC 61000-4-2, IEC 61000-4-4 and IEC61000-4-5 requirements. At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. The PLRT0504LC, in conjunction with passive components integrated into a TVS/filter network can be used for EMI/RFI protection.

**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): 3A - 8/20µs
- ESD Protection > 25 kilovolts
- Protects 4 Data Lines
- Low Leakage Current < 0.1µA
- Ultra Low Capacitance: 0.3pF Typical (I/O to GND)
- RoHS Compliant
- REACH Compliant

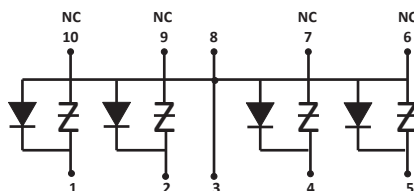
**APPLICATIONS**

- DVI Interface
- High-speed Data Line ESD Protection
- FireWire, SATA, PCIe Interfaces
- USB 1.0 - 3.0
- HDMI 1.4 - 2.0

**MECHANICAL CHARACTERISTICS**

- Molded DFN-10 Package
- Approximate Weight: 7 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure Tin: Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape and Reel per EIA Standard 481

**CIRCUIT DIAGRAM**



Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33  
 info@alcom.be | www.alcom.be  
 Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands  
 Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl

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

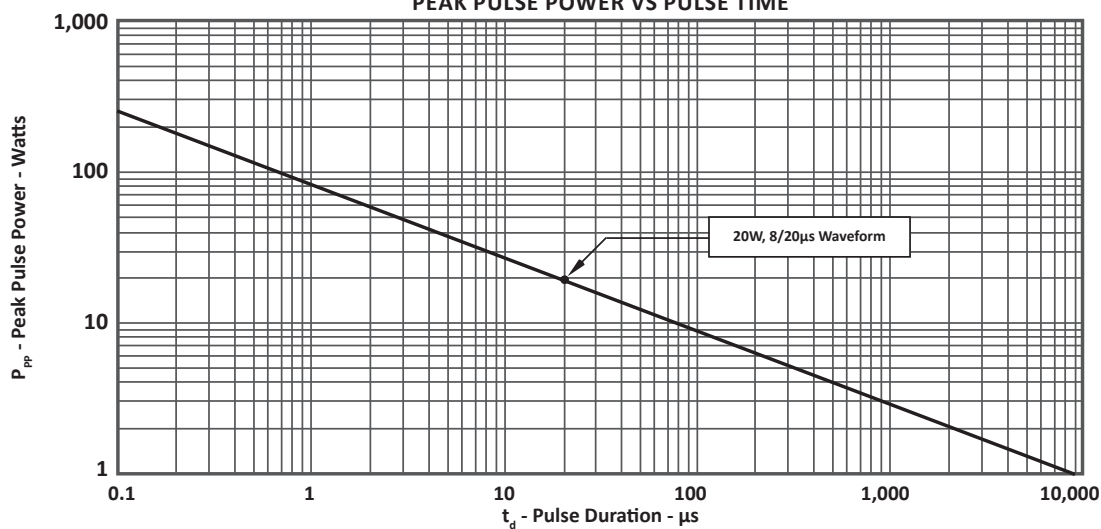
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) - See Figure 1	P <sub>PP</sub>	20	Watts
Operating Temperature	T <sub>L</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C
Peak Pulse Current	I <sub>PP</sub>	3	Amps
ESD Voltage Level per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	±10	kV
ESD Voltage Level per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	±25	kV

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

PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE (Note 1) V <sub>WM</sub> VOLTS	MINIMUM BREAKDOWN VOLTAGE (Note 1) @ 1mA V <sub>(BR)</sub> VOLTS	TYPICAL CLAMPING VOLTAGE 8/20μs @ I <sub>p</sub> = 3A V <sub>C</sub> VOLTS	MAXIMUM LEAKGE CURRENT @3.3V I <sub>R</sub> μA	MAXIMUM CAPACITANCE I/O - GND (Note 2) f = 200MHz to 2.5GHz C pF	MAXIMUM CAPACITANCE I/O - GND (Note 2) f = 2.5GHz to 9GHz C pF	TYPICAL CUT-OFF FREQUENCY @ -3dB f <sub>c</sub> GHz
PLRT0504LC	T5LC	5.0	6.2	6.0	0.05	0.5	0.4	18

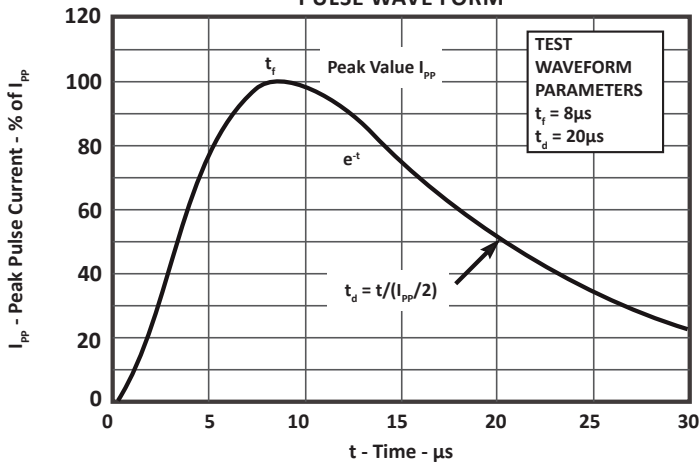
**NOTES**

- Per IEC 61000-4-2 8kV Contact Discharge at 30ns.
- V<sub>bias</sub> = 0Vdc, V<sub>OSC</sub> = 30mV<sub>(RMS)</sub>

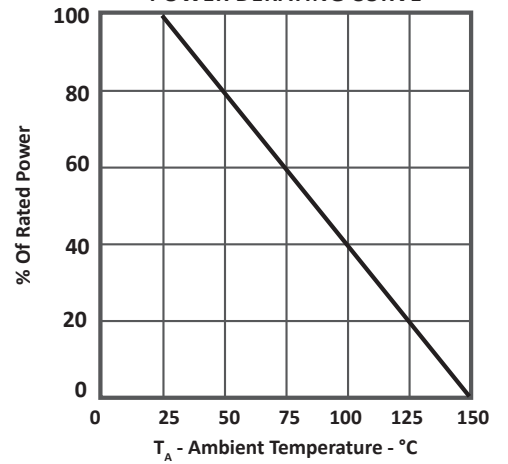
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**


TYPICAL DEVICE CHARACTERISTICS

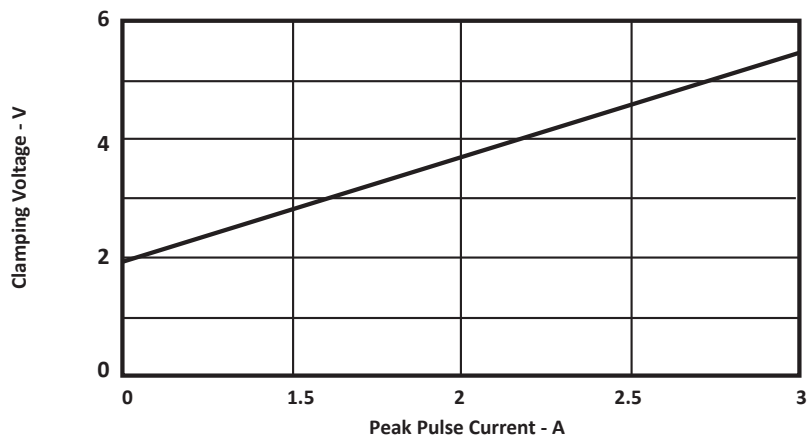
**FIGURE 2**  
PULSE WAVE FORM



**FIGURE 3**  
POWER DERATING CURVE

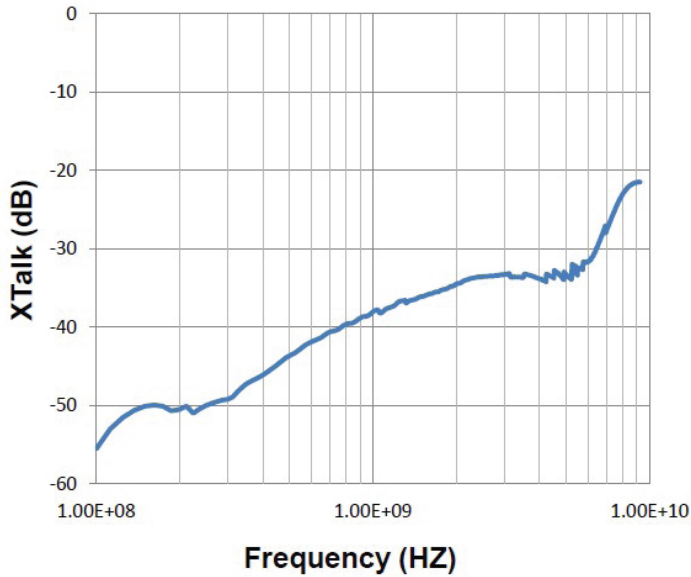


**FIGURE 4**  
CLAMPING VOLTAGE VS IPP

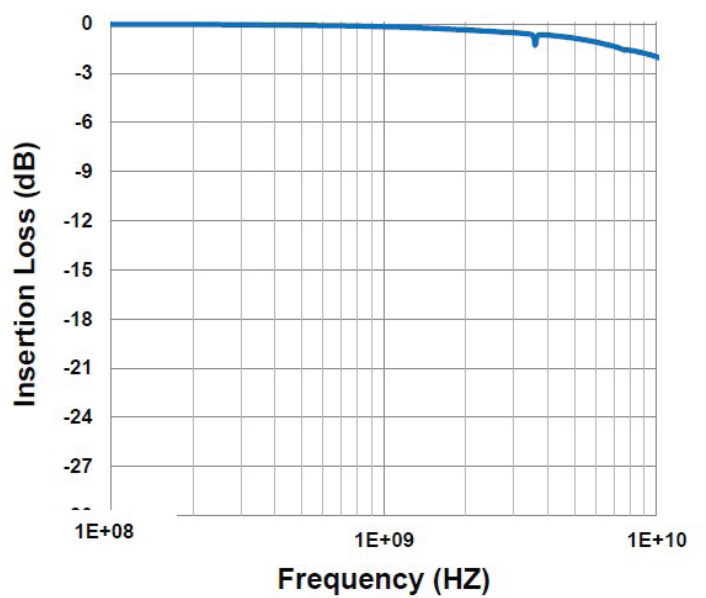


TYPICAL DEVICE CHARACTERISTICS

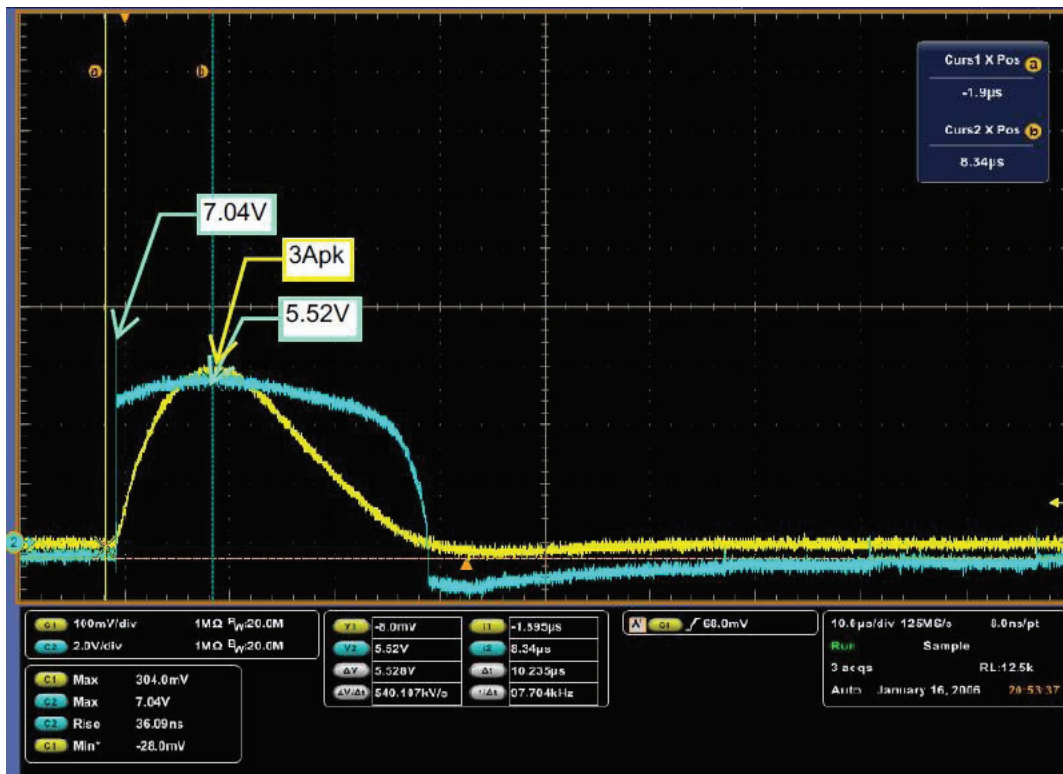
**FIGURE 5**  
CROSSTALK VS FREQUENCY



**FIGURE 6**  
INSERTION LOSS VS FREQUENCY



**FIGURE 7**  
SURGE WAVEFORM



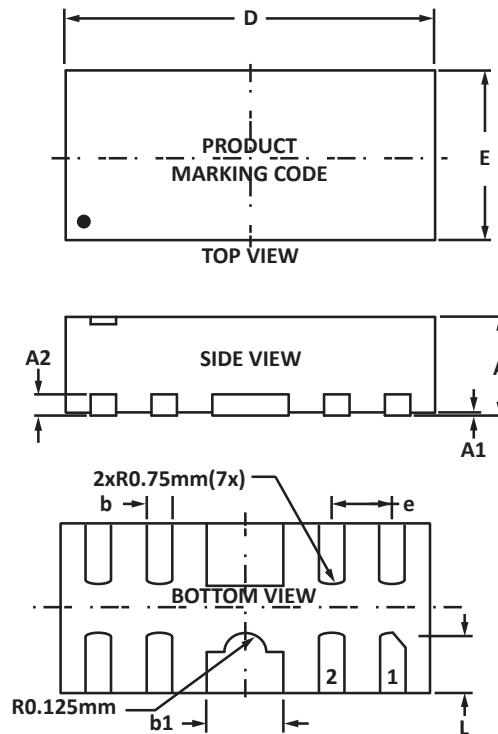
## PACKAGE INFORMATION

### OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.47	0.60	0.019	0.024
A1	0.00	0.05	0.000	0.002
A2	0.13	0.21	0.005	0.008
b	0.15	0.25	0.006	0.010
b1	0.35	0.45	0.014	0.018
D	2.40	2.60	0.094	0.102
E	0.90	1.10	0.035	0.043
e	0.50 Nominal		0.020 Nominal	
L	0.35	0.43	0.014	0.017

#### NOTES

1. Controlling dimension: millimeters.

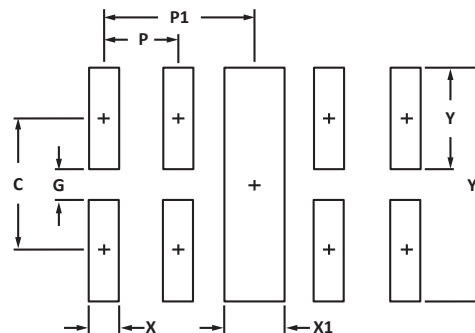


### PAD LAYOUT

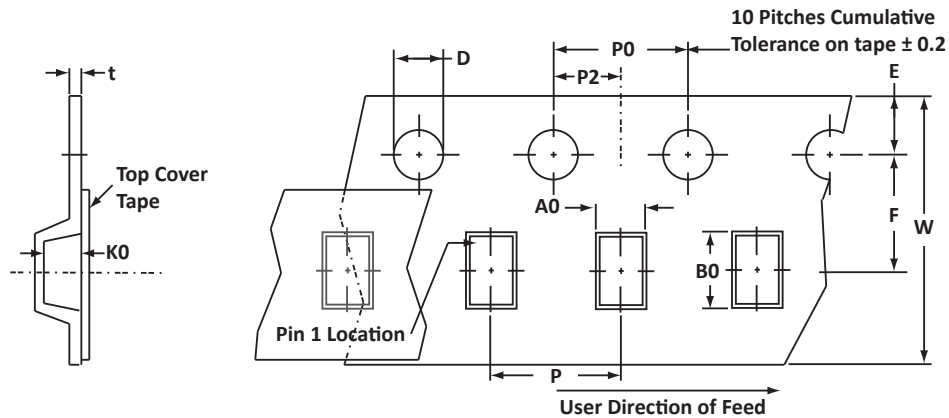
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
C	0.875	0.34
G	0.20	0.008
P	0.50	0.020
P1	1.00	0.039
X	0.25	0.010
X1	0.46	0.018
Y	0.675	0.027
Y1	1.55	0.061

#### NOTES

1. Controlling dimension: millimeters.



## TAPE AND REEL



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	1.20 ± 0.10	2.70 ± 0.10	0.75 ± 0.10	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 - T73 = 7" Reel - 3,000 pieces per 8mm tape.
4. Marking on Part - marking code (see page 2).

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PLRT0504LC	n/a	-T73	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 an ISO 9001 certified company.

### CONTACT US

#### Corporate Headquarters

2929 South Fair Lane  
Tempe, Arizona 85282  
USA

#### By Telephone

General: 602-431-8101  
Sales: & Marketing: 602-414-5109  
Customer Service: 602-414-5114  
Product Technical Support: 602-414-5107

#### By Fax

General: 602-431-2288

#### By E-mail:

Asia Sales: [asiasales@protekdevices.com](mailto:asiasales@protekdevices.com)  
Europe Sales: [europesales@protekdevices.com](mailto:europesales@protekdevices.com)  
U.S. Sales: [ussales@protekdevices.com](mailto:ussales@protekdevices.com)  
Distributor Sales: [distysales@protekdevices.com](mailto:distysales@protekdevices.com)  
Customer Service: [service@protekdevices.com](mailto:service@protekdevices.com)  
Technical Support: [support@protekdevices.com](mailto:support@protekdevices.com)

#### ProTek Devices (Asia Pacific) Pte. Ltd.

8 Ubi Road 2, #06-19  
Zervex  
Singapore - 408538  
Tel: +65-67488312  
Fax: +65-67488313

#### Web

[www.protekdevices.com](http://www.protekdevices.com)



Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33  
[info@alcom.be](mailto:info@alcom.be) | [www.alcom.be](http://www.alcom.be)  
Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands  
Tel. +31 (0)10 288 25 00 | [info@alcom.nl](mailto:info@alcom.nl) | [www.alcom.nl](http://www.alcom.nl)

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