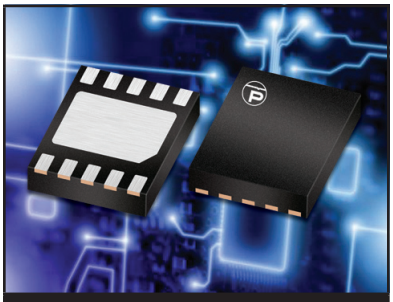
# ULTRA LOW CAPACITANCE STEERING DIODE/TVS ARRAY



DFN-10 PACKAGE

## DESCRIPTION

The PLR3304 is an ultra low capacitance steering diode/TVS array. This device is designed to protect computing applications such as gigabit Ethernet, USb and DVI interfaces as well as telecommunication equipment and systems. The PLR3304 is available in the space-saving DFN-10 package configuration and is rated at 400 Watts peak pulse current (8/20µs waveshape).

This device meets the IEC 61000-4-2 (ESD), 61000-4-2 (EFT) and 61000-4-4 (Surge) requirements. At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. This device 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)
- 400 Watts Peak Pulse Power per Line(tp = 8/20µs)
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Unidirectional Configuration
- Protects 4 I/O Ports & Power Supply
- Ultra Low Capacitance : 4pF
- RoHS Compliant
- REACH Compliant

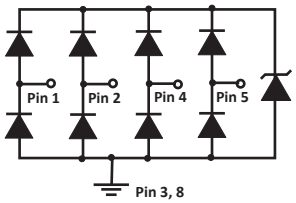
## APPLICATIONS

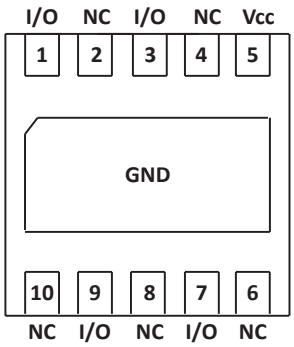
- Gigabit Ethernet
- T1/E1, T3/E3 Chip Side Protection
- Wireless Communications
- USB & DVI Interfaces

## MECHANICAL CHARACTERISTICS

- Molded JEDEC DFN-10 Package
- Approximate Weight: 7 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

## CIRCUIT DIAGRAM & PIN CONFIGURATION



## TYPICAL DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified | | | |
|---|---|---|---|
| PARAMETER | SYMBOL | VALUE | UNITS |
| Peak Pulse Power (tp = 8/20µs) - See Figure 1 | $P_{PP}$ | 400 | Watts |
| Operating Temperature | $T_L$ | -55 to 150 | °C |
| Storage Temperature | $T_{STG}$ | -55 to 150 | °C |
| Peak Pulse Current - 8/20µs | $I_{PP}$ | 18 | Amps |

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

| PART NUMBER | DEVICE MARKING | RATED STAND-OFF VOLTAGE $V_{WM}$ VOLTS | MINIMUM SNAP-BACK VOLTAGE @ 50mA $V_{(SB)}$ VOLTS | MINIMUM PUNCH THROUGH VOLTAGE @ 5µA $V_{(PT)}$ VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ $I_P$ = 1A $V_C$ VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ $I_P$ = 10A $V_C$ VOLTS | MAXIMUM LEAKAGE CURRENT @$V_{WM}$ $I_D$ µA | TYPICAL CAPACITANCE I/O TO GND @0V, 1MHz C pF |
|---|---|---|---|---|---|---|---|---|
| PLR3304 | 334 | 3.3 | 3.3 | 3.5 | 5.5 | 10.0 | 1.0 | 4.0 |

**NOTE**
1. Pin 5 to ground.

## TYPICAL DEVICE CHARACTERISTICS

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

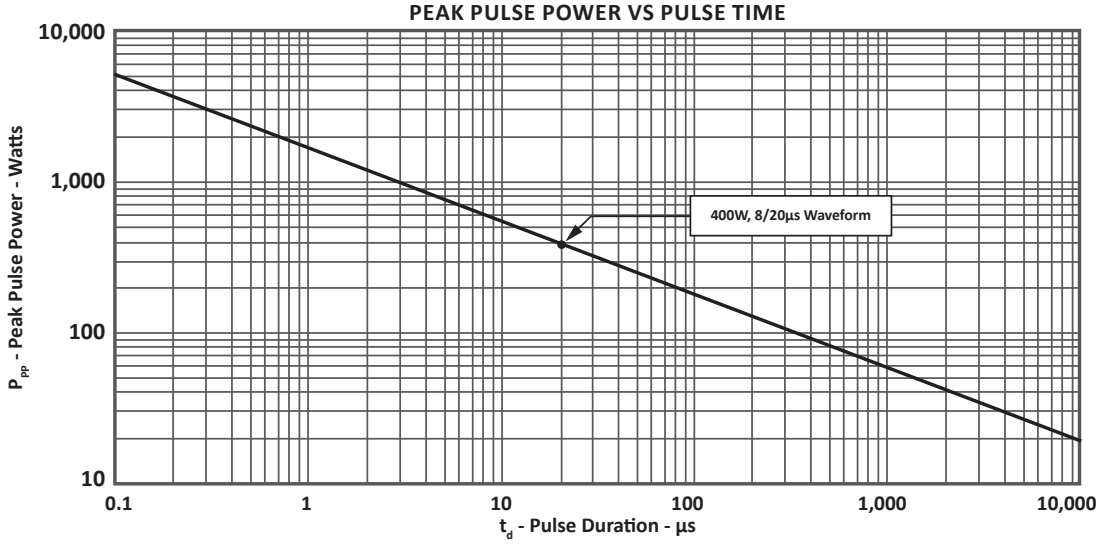



**FIGURE 2**
**PULSE WAVE FORM**

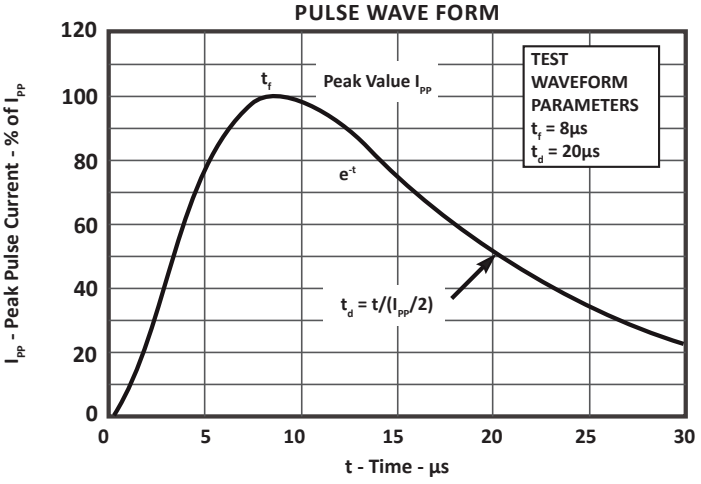
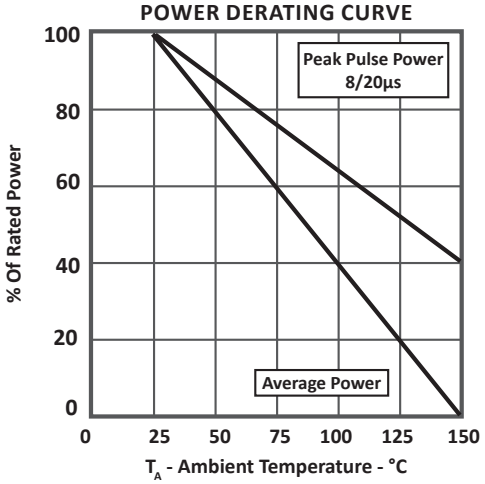
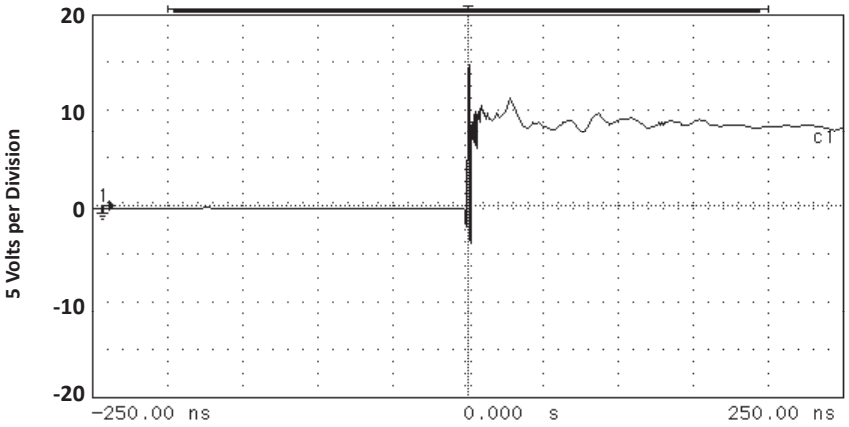



**FIGURE 3**
**POWER DERATING CURVE**



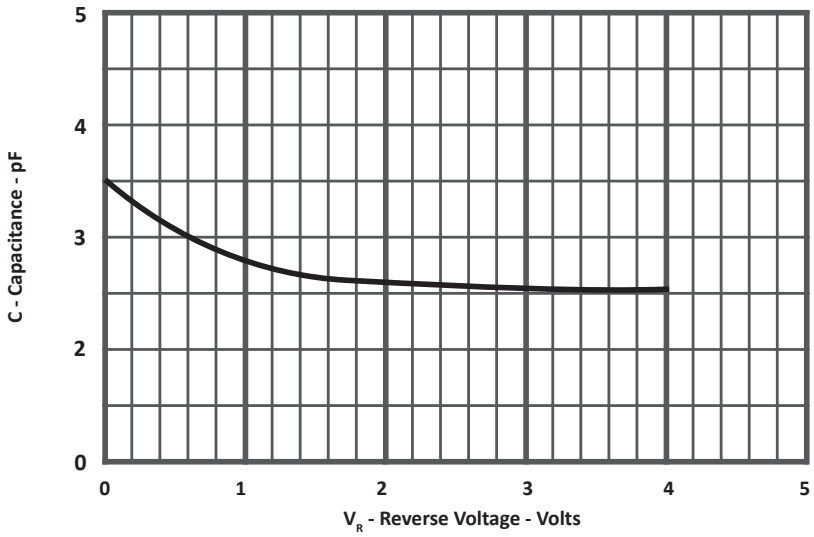
## TYPICAL DEVICE CHARACTERISTICS

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




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

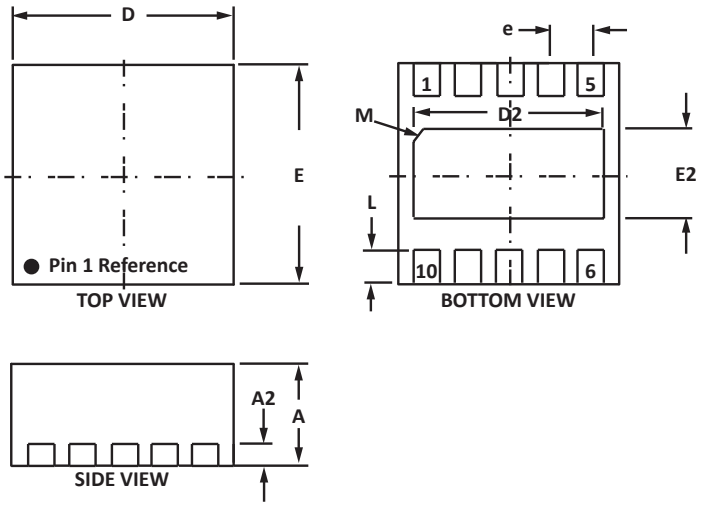
**FIGURE 5**
**TYPICAL REVERSE VOLTAGE VS CAPACITANCE**



## DFN-10 PACKAGE INFORMATION

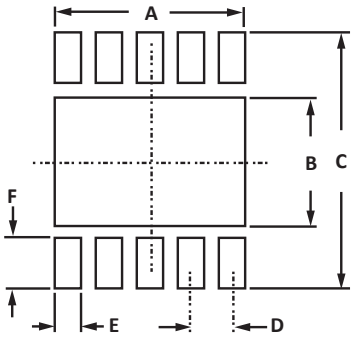
| OUTLINE DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 0.45 | 0.55 | 0.017 | 0.021 |
| A2 | 0.13 BSC | | 0.005 BSC | |
| D | 2.50 | 2.70 | 0.097 | 0.105 |
| D2 | 2.10 | 2.20 | 0.083 | 0.085 |
| E | 2.50 | 2.70 | 0.097 | 0.105 |
| E2 | 1.21 | 1.31 | 0.046 | 0.051 |
| e | 0.50 BSC | | 0.020 BSC | |
| L | 0.35 | 0.45 | 0.013 | 0.017 |
| M | 0.25 | 0.45 | 0.010 | 0.018 |

**NOTES**
1. Controlling dimension: millimeters.
2. Dimensioning and tolerances per ANSI Y14.M, 1985.
3. Coplanarity applies to the exposed pad as well as the terminals.

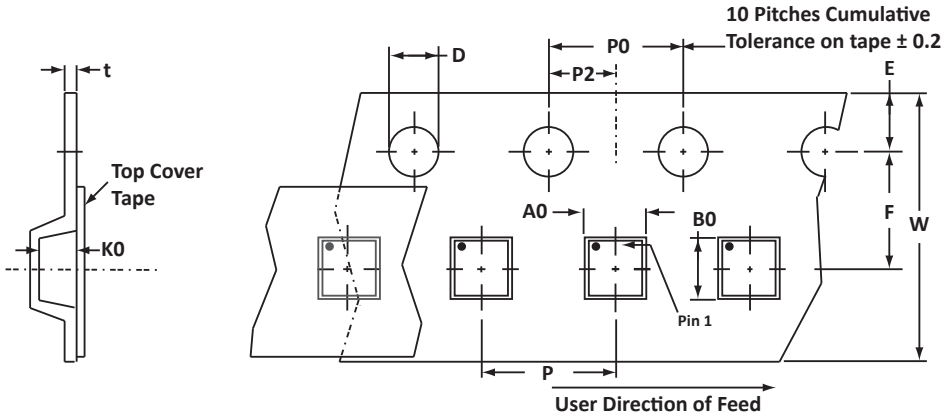



| PAD LAYOUT DIMENSIONS | | |
|---|---|---|
| DIM | MILLIMETERS | INCHES |
| | NOMINAL | NOMINAL |
| A | 2.25 | 0.089 |
| B | 1.42 | 0.056 |
| C | 2.90 | 0.114 |
| D | 0.50 BSC | 0.020 BSC |
| E | 0.30 | 0.012 |
| F | 0.58 | 0.023 |

**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 | 2.90 ± 0.10 | 2.90 ± 0.10 | 0.80 ± 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) and polarity dot.

Package outline, pad layout and tape specifications per document number 06080.R0 3/11.

| ORDERING INFORMATION | | | | | |
|---|---|---|---|---|---|
| BASE PART NUMBER | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
| PLR3304 | -LF | -T73 | 3,000 | 7" | n/a |

## COMPANY INFORMATION

### COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

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