

## 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>  | 500        | Watts |
| Operating Temperature                         | T <sub>L</sub>   | -55 to 150 | °C    |
| Storage Temperature                           | T <sub>STG</sub> | -55 to 150 | °C    |

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

| PART NUMBER<br>(Note 1) | DEVICE MARKING | RATED STAND-OFF VOLTAGE<br><br>V <sub>WM</sub><br>VOLTS | MINIMUM BREAKDOWN VOLTAGE<br>(Note 2)<br>@ 1mA<br>V <sub>(BR)</sub><br>VOLTS | MAXIMUM CLAMPING VOLTAGE<br>(Fig. 2)<br>@ I <sub>p</sub> = 1A<br>V <sub>c</sub><br>VOLTS | MAXIMUM CLAMPING VOLTAGE<br>(Fig. 2)<br>@ I <sub>p</sub> = 5A<br>V <sub>c</sub><br>VOLTS | MAXIMUM LEAKAGE CURRENT<br><br>@V <sub>WM</sub><br>I <sub>D</sub><br>μA | TYPICAL CAPACITANCE<br><br>@0V, 1MHz<br>C<br>pF |
|-------------------------|----------------|---------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------|
| PSOT03LC                | 03L            | 3.3                                                     | 4.0                                                                          | 7.0                                                                                      | 9.0                                                                                      | 125                                                                     | 5                                               |
| PSOT05LC                | 05L            | 5.0                                                     | 6.0                                                                          | 9.8                                                                                      | 11.0                                                                                     | 20                                                                      | 5                                               |
| PSOT08LC                | 08L            | 8.0                                                     | 8.5                                                                          | 13.4                                                                                     | 15.0                                                                                     | 10                                                                      | 5                                               |
| PSOT12LC                | 12L            | 12.0                                                    | 13.3                                                                         | 19.0                                                                                     | 23.0                                                                                     | 1                                                                       | 5                                               |
| PSOT15LC                | 15L            | 15.0                                                    | 16.7                                                                         | 24.0                                                                                     | 28.0                                                                                     | 1                                                                       | 5                                               |
| PSOT24LC                | 24L            | 24.0                                                    | 26.7                                                                         | 43.0                                                                                     | 46.0                                                                                     | 1                                                                       | 5                                               |
| PSOT36LC                | 36L            | 36.0                                                    | 40.0                                                                         | 51.0                                                                                     | 68.0                                                                                     | 1                                                                       | 5                                               |

## NOTES

1. Positive potential is applied from pin 1 to 2; pin 2 is ground.
2. Do not test or surge from pin 2 to 1. PIV typically greater than 100V for rectifier diode.

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1  
PEAK PULSE POWER VS PULSE TIME

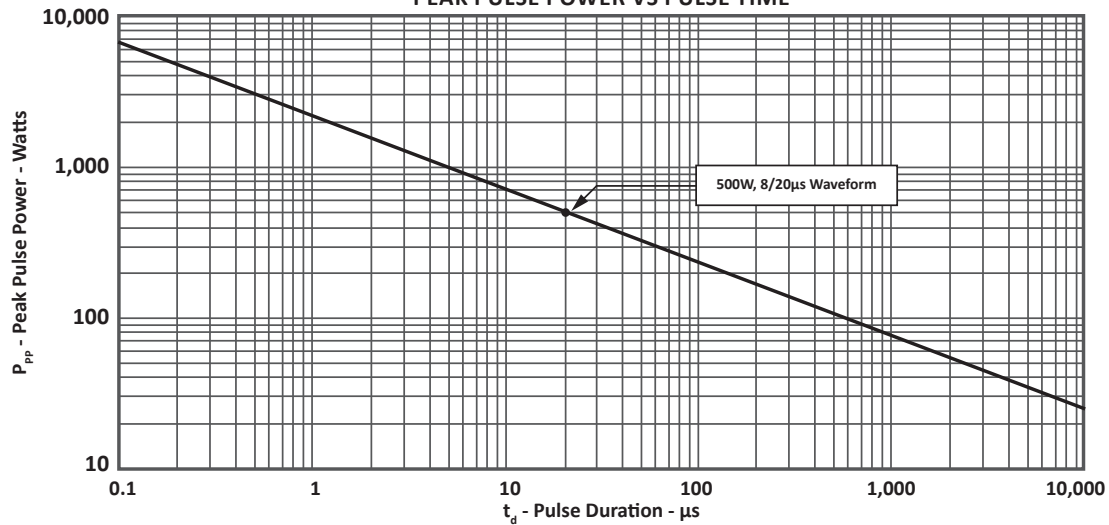


FIGURE 2  
PULSE WAVE FORM

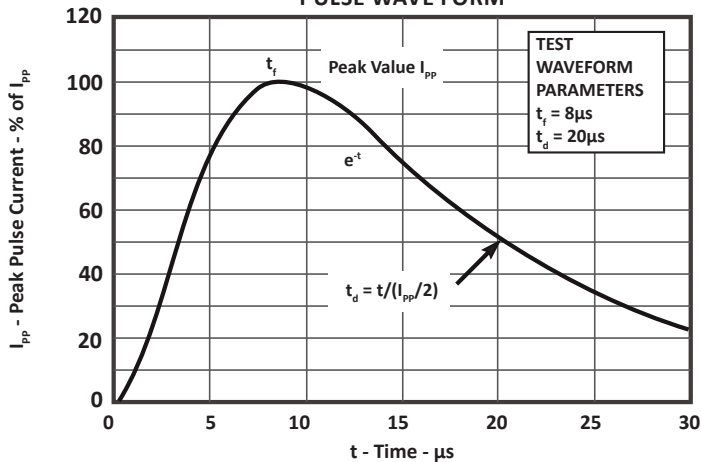
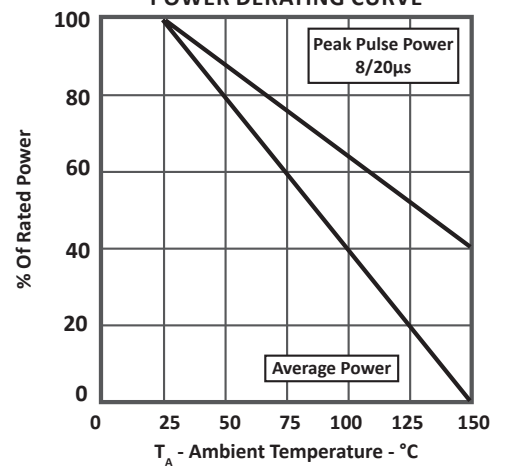
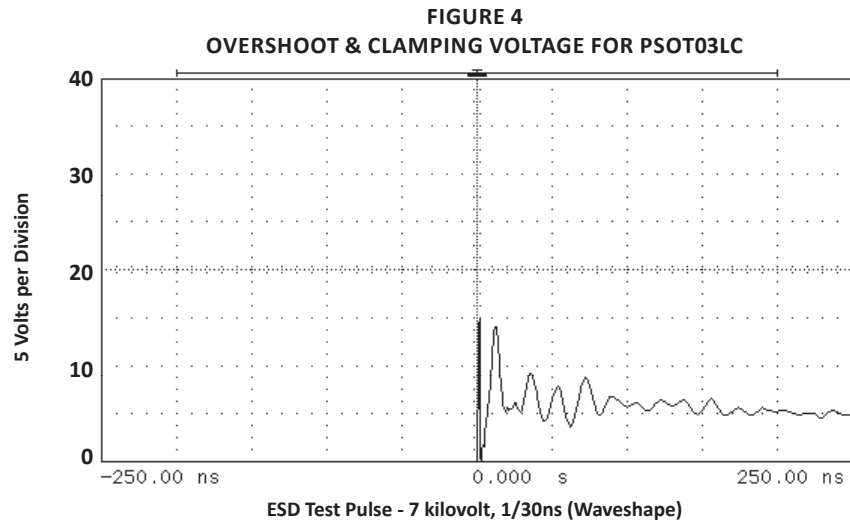


FIGURE 3  
POWER DERATING CURVE



**TYPICAL DEVICE CHARACTERISTICS**

## SPICE MODEL

**FIGURE 1**  
**SPICE MODEL FOR**


ABD - Avalanche Breakdown Diode (TVS)  
 LCRD - Low Capacitance Rectifier Diode  
 Lg - Lead Inductance

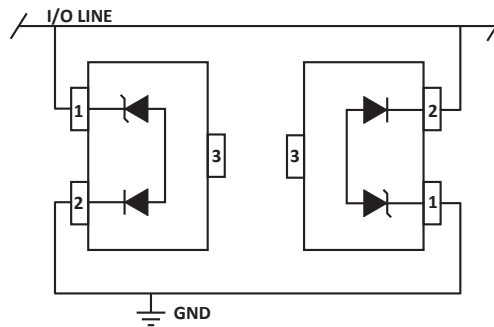
**TABLE 1 - SPICE PARAMETERS**

| PARAMETER | UNIT          | ABD(TVS)    | LCRD  |
|-----------|---------------|-------------|-------|
| BV        | V             | See Table 2 | 200   |
| IBV       | $\mu\text{A}$ | 1           | 0.01  |
| $C_{jo}$  | pF            | See Table 2 | 5     |
| $I_s$     | A             | See Table 2 | 1E-14 |
| Vj        | V             | 0.6         | 0.6   |
| M         | -             | 0.33        | 0.33  |
| N         | -             | 1           | 1     |
| $R_s$     | Ohms          | See Table 2 | 0.31  |
| TT        | s             | 1E-8        | 1E-9  |
| EG        | eV            | 1.11        | 1.11  |

**TABLE 2 - ABD SPECIFIC SPICE PARAMETERS**

| PART NUMBER | $B_V$ (VOLTS) | $C_{jo}$ (pF) | $I_s$ (AMPS) | $R_s$ (OHMS) |
|-------------|---------------|---------------|--------------|--------------|
| PSOT03LC    | 4.5           | 438           | 1E-11        | 0.21         |
| PSOT05LC    | 6.0           | 284           | 1E-11        | 0.14         |
| PSOT08LC    | 8.5           | 146           | 1E-11        | 0.28         |
| PSOT12LC    | 13.3          | 123           | 1E-13        | 0.40         |
| PSOT15LC    | 16.7          | 102           | 1E-13        | 0.52         |
| PSOT12LC    | 26.7          | 61            | 1E-13        | 1.54         |

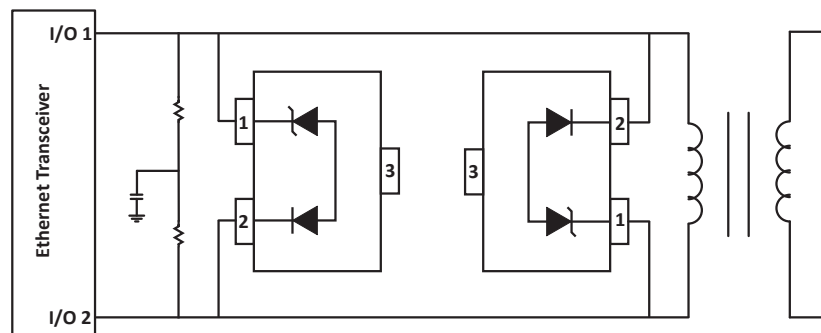
## APPLICATION INFORMATION



**FIGURE 1 - COMMON MODE I/O PORT PROTECTION**

Two PSOTxxLC devices used in parallel. Circuit connectivity is as follows:

- I/O Line connected to Device 1, Pin 1.
- I/O Line connected to Device 2, Pin 2.
- Device 1, Pin 2 connected to ground.
- Device 2, Pin 1 connected to ground.
- Device 1 and 2, Pin 3 not connected.



**FIGURE 1 - DIFFERENTIAL MODE ETHERNET PROTECTION**

Two PSOTxxLC devices used in parallel. Circuit connectivity is as follows:

- I/O Line 1 connected to Device 1, Pin 1.
- I/O Line 1 connected to Device 2, Pin 2.
- I/O Line 2 connected to Device 1, Pin 2.
- I/O Line 2 connected to Device 2, Pin 1.
- Device 1 and 2, Pin 3 not connected.

## CIRCUIT BOARD RECOMMENDATIONS

Circuit board layout is critical for electromagnetic compatibility protection. The following guidelines are recommended:

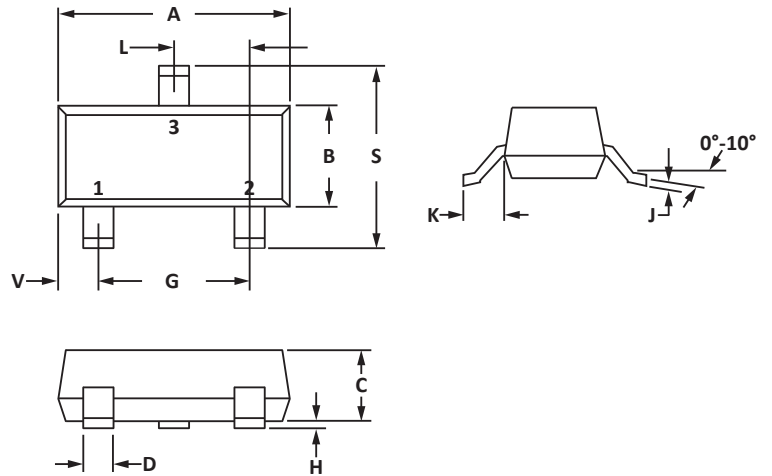
- The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- The path length between the TVS device and the protected line should be minimized.
- All conductive loops including 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 dedicated ground planes

## SOT-23 PACKAGE INFORMATION

| OUTLINE DIMENSIONS |             |       |        |       |
|--------------------|-------------|-------|--------|-------|
| DIM                | MILLIMETERS |       | INCHES |       |
|                    | MIN         | MAX   | MIN    | MAX   |
| A                  | 2.80        | 3.04  | 0.110  | 0.120 |
| B                  | 1.20        | 1.40  | 0.047  | 0.055 |
| C                  | 0.89        | 1.11  | 0.035  | 0.044 |
| D                  | 0.37        | 0.50  | 0.015  | 0.020 |
| G                  | 1.78        | 2.04  | 0.070  | 0.081 |
| H                  | 0.013       | 0.100 | 0.001  | 0.004 |
| J                  | 0.085       | 0.177 | 0.003  | 0.007 |
| K                  | 0.45        | 0.60  | 0.018  | 0.024 |
| L                  | 0.89        | 1.02  | 0.035  | 0.040 |
| S                  | 2.10        | 2.50  | 0.083  | 0.098 |
| V                  | 0.45        | 0.60  | 0.018  | 0.024 |

**NOTES**

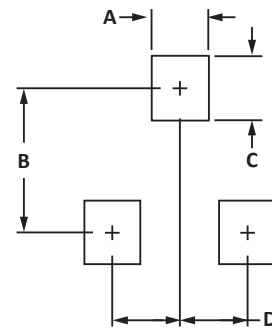
1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Pin 3 is the cathode (Unidirectional Only)
4. Dimensions are exclusive of mold flash and metal burrs.



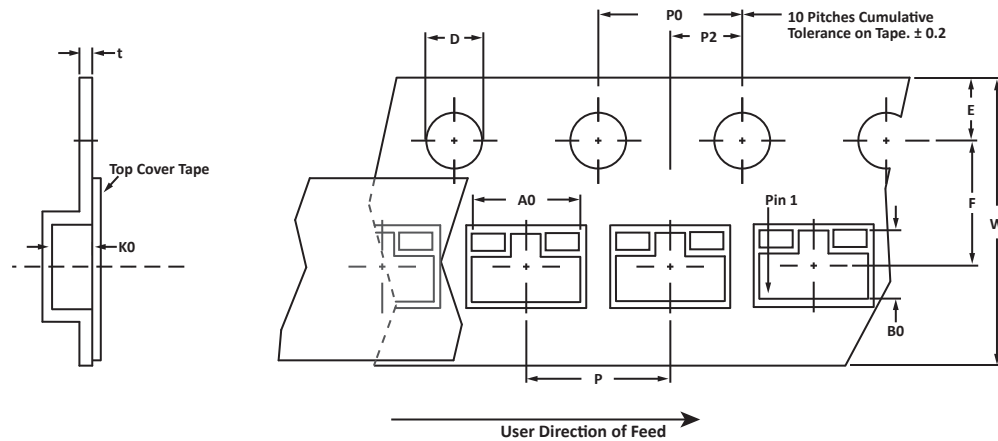
| PAD LAYOUT DIMENSIONS |             |      |        |       |
|-----------------------|-------------|------|--------|-------|
| DIM                   | MILLIMETERS |      | INCHES |       |
|                       | MIN         | MAX  | MIN    | MAX   |
| A                     | 0.71        | 0.97 | 0.028  | 0.038 |
| B                     | 1.88        | 2.13 | 0.074  | 0.084 |
| C                     | 0.71        | 0.97 | 0.028  | 0.038 |
| D                     | 0.81        | 1.07 | 0.032  | 0.042 |

**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        | 3.15 ± 0.10 | 2.77 ± 0.10 | 1.30 ± 0.10 | 1.55 ± 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 | 0.228 |

## 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. Suffix - T13 = 13" Reel - 10,000 pieces per 8mm tape.
5. Marking on Part - marking code (see page 2) and date code.

Package outline, pad layout and tape specifications per document number 06012.R2 8/10.

## ORDERING INFORMATION

| BASE PART NUMBER<br>(xx = Voltage) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------------------------|-----------------|-------------|----------|-----------|----------|
| PSOTxxLC                           | -LF             | -T7         | 3,000    | 7"        | n/a      |
| PSOTxxLC                           | -LF             | -T13        | 10,000   | 13"       | n/a      |

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

## COMPANY INFORMATION

---

### 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.

### 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)

COPYRIGHT © ProTek Devices 1998 - This literature is subject to all applicable copyright laws and is not for resale in any manner.

SPECIFICATIONS: ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice.

DESIGN CHANGES: ProTek reserves the right to discontinue product lines without notice and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance. ProTek assumes no responsibility with respect to the selection or specifications of such products. ProTek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ProTek assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability without limitation special, consequential or incidental damages.

LIFE SUPPORT POLICY: ProTek Devices products are not authorized for use in life support systems without written consent from the factory.