## 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 |
| Forward Voltage @ 50mA, 300µs - Square Wave (See Note 1) | $V_F$ | 1.5 | Volts |

**NOTE**
1. Only applies to unidirectional devices.

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

| PART NUMBER (Note 1) | DEVICE MARKING | RATED STAND-OFF VOLTAGE $V_{WM}$ VOLTS | MINIMUM BREAKDOWN VOLTAGE @1mA $V_{(BR)}$ VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) @$I_P$ = 1A $V_C$ VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ 8/20µs $V_C$ @ $I_{PP}$ VOLTS | MAXIMUM LEAKAGE CURRENT @$V_{WM}$ $I_D$ µA | MAXIMUM CAPACITANCE @0V, 1MHz C pF |
|---|---|---|---|---|---|---|---|
| SMDA03LC | SLA | 3.3 | 4.5 | 7.0 | 10.9V @ 43.0A | 125 | 8 |
| SMDA03LCC | SLB | 3.3 | 4.5 | 7.0 | 10.9V @ 43.0A | 125 | 8 |
| SMDA05LC | SLC | 5.0 | 6.0 | 9.8 | 13.5V @ 42.0A | 20 | 8 |
| SMDA05LCC | SLD | 5.0 | 6.0 | 9.8 | 13.5V @ 42.0A | 20 | 8 |
| SMDA08LC | SLE | 8.0 | 8.5 | 13.4 | 16.9V @ 34.0A | 10 | 8 |
| SMDA08LCC | SLF | 8.0 | 8.5 | 13.4 | 16.9V @ 34.0A | 10 | 8 |
| SMDA12LC | SLG | 12.0 | 13.3 | 19.0 | 25.9V @ 27.0A | 1 | 8 |
| SMDA12LCC | SLH | 12.0 | 13.3 | 19.0 | 25.9V @ 27.0A | 1 | 8 |
| SMDA15LC | SLJ | 15.0 | 16.7 | 24.0 | 30.0V @ 17.0A | 1 | 8 |
| SMDA15LCC | SLK | 15.0 | 16.7 | 24.0 | 30.0V @ 17.0A | 1 | 8 |
| SMDA24LC | SLL | 24.0 | 26.7 | 43.0 | 49.0V @ 12.0A | 1 | 8 |
| SMDA24LCC | SLM | 24.0 | 26.7 | 43.0 | 49.0V @ 12.0A | 1 | 8 |

**NOTES**
1. Part numbers with a "C" suffix are bidirectional devices, i.e., SMDA03LC**C**.

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

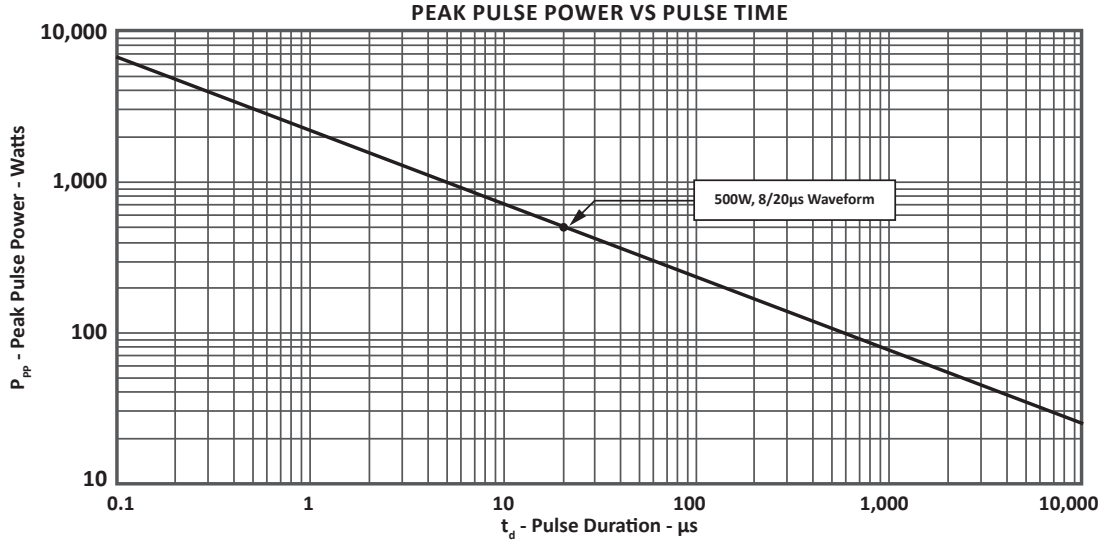



FIGURE 2
PULSE WAVE FORM

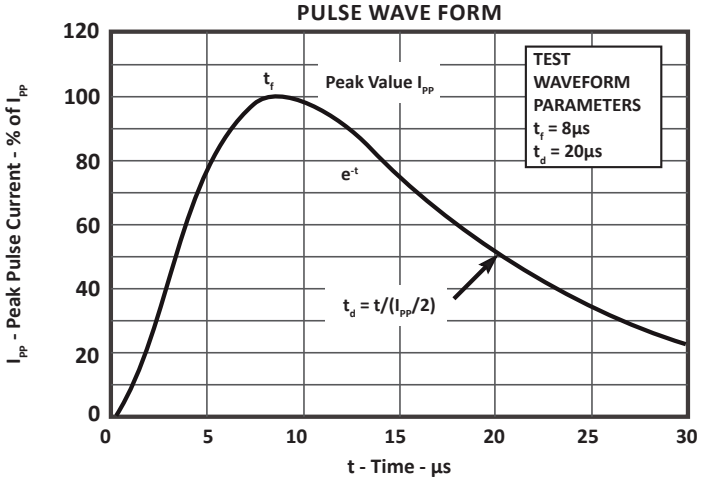
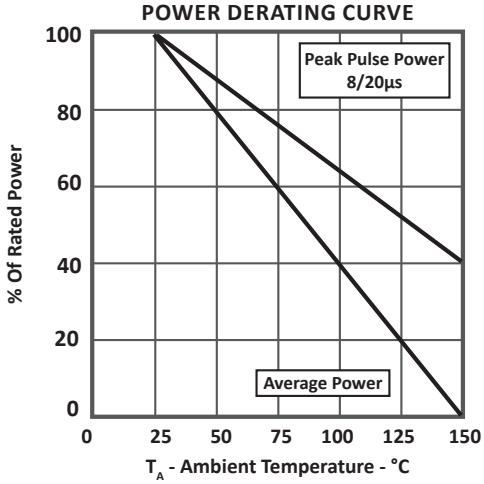
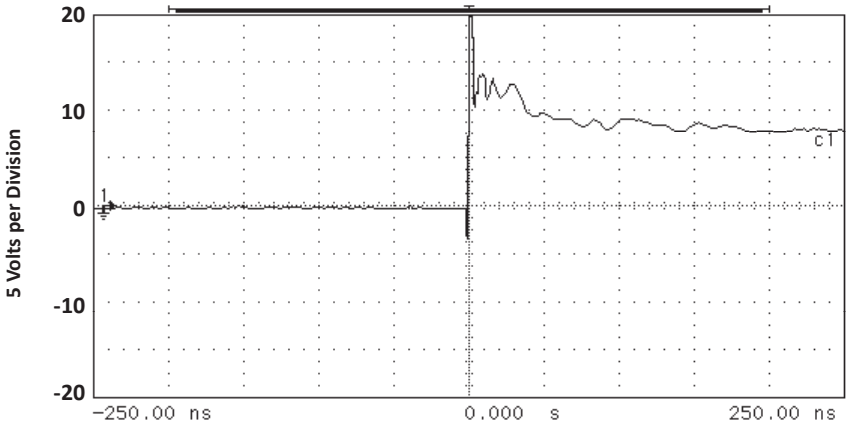



FIGURE 3
POWER DERATING CURVE



## TYPICAL DEVICE CHARACTERISTICS

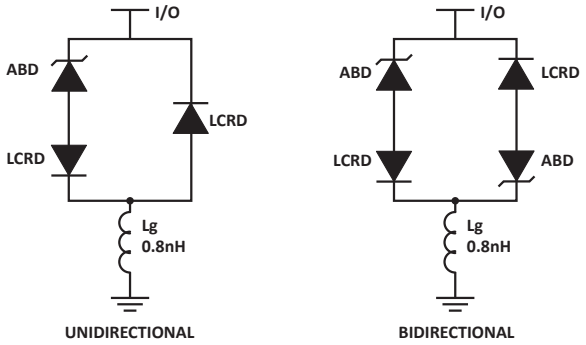
**FIGURE 4**
**OVERSHOOT & CLAMPING VOLTAGE FOR SMDA05LC**




**ESD Test Pulse - 5 kilovolt, 1/30ns (Waveshape)**

## SPICE MODEL

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




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

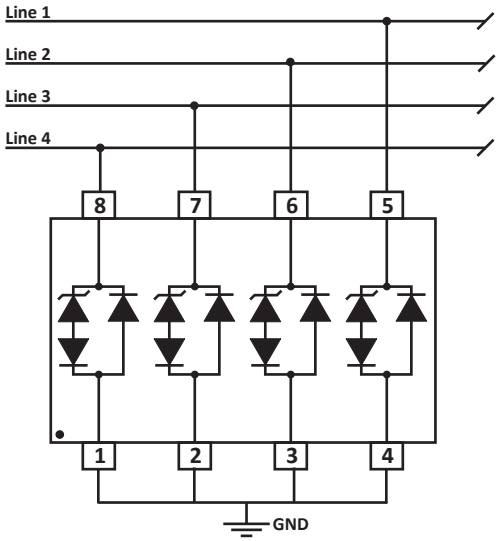
**TABLE 1 - SPICE PARAMETERS**

| PARAMETER | UNIT | ABD(TVS) | LCRD |
|---|---|---|---|
| BV | V | See Table 2 | 200 |
| IBV | µA | 1 | 0.01 |
| $C_{jo}$ | pF | See Table 2 | 5 |
| $I_S$ | A | See Table 2 | 1E-13 |
| 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) | Rs(OHMS) |
|---|---|---|---|---|
| SMDA03LC | 4.5 | 438 | 1E-11 | 0.21 |
| SMDA05LC | 6.0 | 284 | 1E-11 | 0.14 |
| SMDA08LC | 8.5 | 146 | 1E-11 | 0.28 |
| SMDA12LC | 13.3 | 123 | 1E-13 | 0.40 |
| SMDA15LC | 16.7 | 102 | 1E-13 | 0.52 |
| SMDA24LC | 26.7 | 61 | 1E-13 | 1.54 |
| SMDA03LCC | 4.5 | 438 | 1E-11 | 0.21 |
| SMDA05LCC | 6.0 | 284 | 1E-11 | 0.14 |
| SMDA08LCC | 8.5 | 146 | 1E-11 | 0.28 |
| SMDA12LCC | 13.3 | 123 | 1E-13 | 0.40 |
| SMDA15LCC | 16.7 | 102 | 1E-13 | 0.52 |
| SMDA24LCC | 26.7 | 61 | 1E-13 | 1.54 |

## APPLICATION INFORMATION

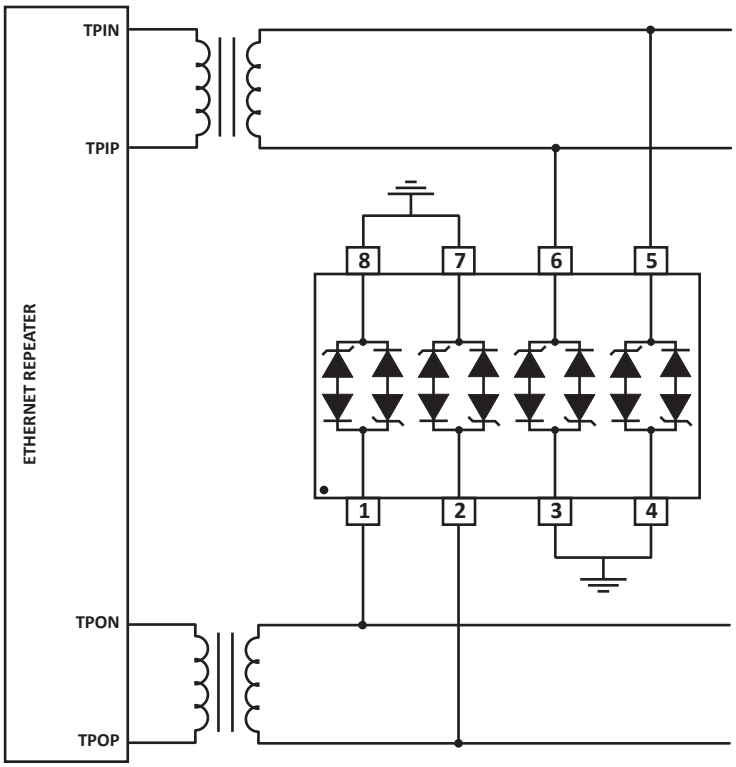



## FIGURE 1 - UNIDIRECTIONAL COMMON-MODE PROTECTION

Circuit connectivity is as follows:

- Line 1 connected to Pin 5.
- Line 2 connected to Pin 6.
- Line 3 connected to Pin 7.
- Line 4 connected to Pin 8.
- Pins 1 - 4 connected to ground.

## APPLICATION INFORMATION




### FIGURE 2 - BIDIRECTIONAL COMMON-MODE ETHERNET PROTECTION

Circuit connectivity is as follow:
- TPIN connected to Pin 5.
- TPIP connected to Pin 6.
- TPON connected to Pin 1.
- TPOP connected to Pin 2.
- Pins 3, 4, 7 and 8 connected to ground.

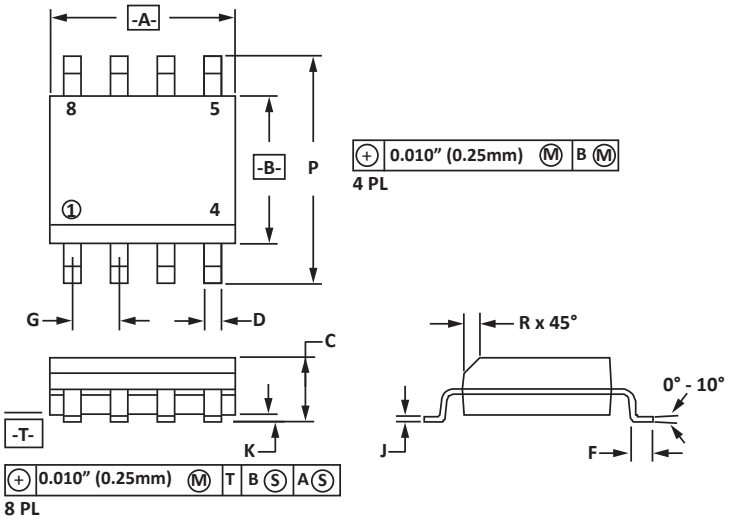
## CIRCUIT BOARD RECOMMENDATIONS

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

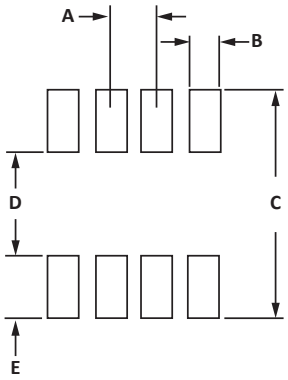
| OUTLINE DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.196 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 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.

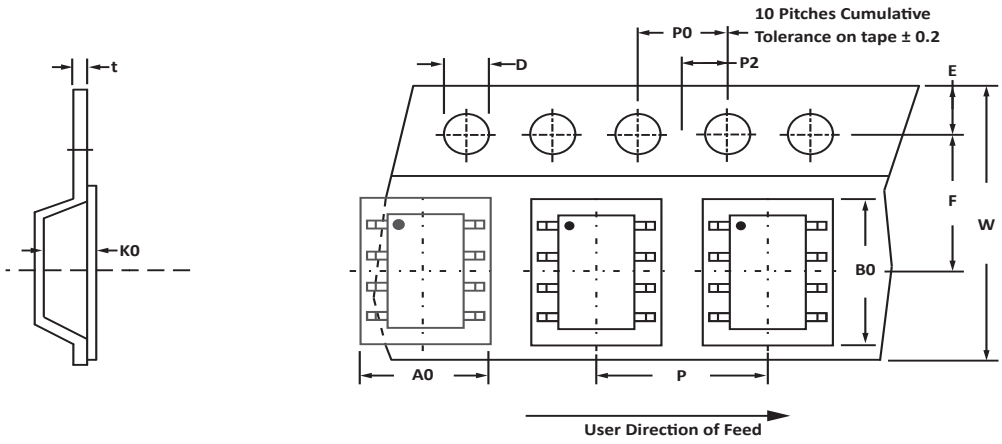



| PAD LAYOUT DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 1.14 | 1.40 | 0.045 | 0.055 |
| B | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 6.22 | - | 0.245 | - |
| D | 3.94 | 4.17 | 0.155 | 0.165 |
| E | 1.02 | 1.27 | 0.040 | 0.050 |

**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 | 8.00 ± 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.

| ORDERING INFORMATION | | | | | |
|---|---|---|---|---|---|
| BASE PART NUMBER (xx = Voltage) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
| SMDAxx/SMDAxxC | -LF | -T7 | 1,000 | 7" | 98 |
| SMDAxx/SMDAxxC | -LF | -T13 | 2,500 | 13" | 98 |
| 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.

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