## TYPICAL DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **VALUE** | **UNITS** |
| Surge Current - 50/60Hz (SC Series) | $I_{TSM}$ | 60 | Amps |
| Junction Temperature | $T_A$ | -40 to 150 | °C |
| Storage Temperature | $T_{STG}$ | -55 to 150 | °C |
| Thermal Resistance (Junction) - SA & SB Series | $R_{QJC}$ | 28 | °C/Watt |
| Thermal Resistance (Junction) - SC Series | $R_{QJC}$ | 26 | °C/Watt |
| Thermal Resistance (Ambient) - SA & SB Series | $R_{QJA}$ | 90 | °C/Watt |
| Thermal Resistance (Ambient) - SC Series | $R_{QJA}$ | 85 | °C/Watt |

**FIGURE 1**
**PULSE WAVEFORM**

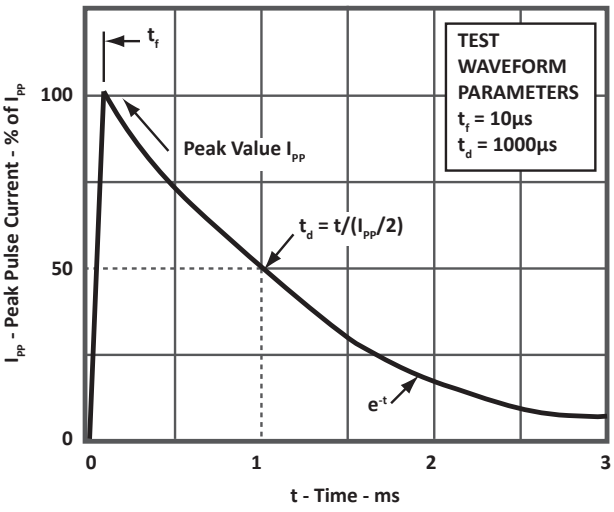



**FIGURE 2**
**VI CHARACTERISITC CURVE**

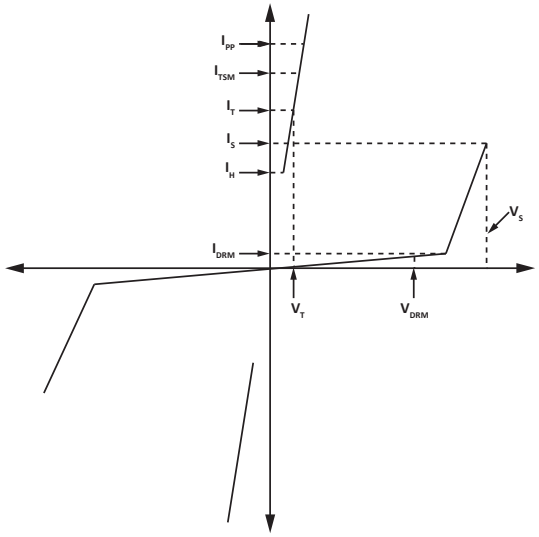
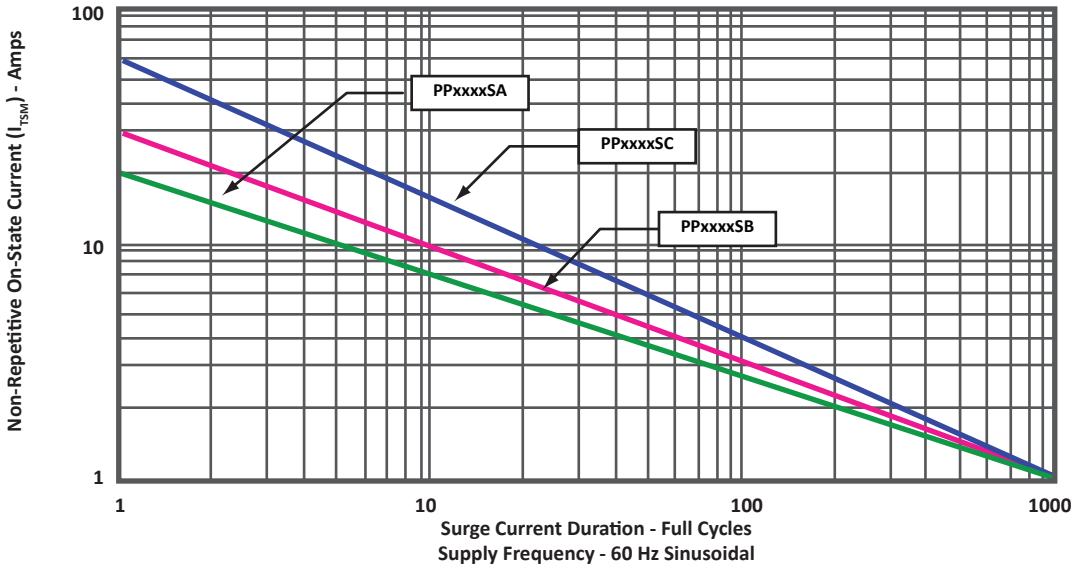



**FIGURE 3**
**ON-STATE CURRENT VS SURGE CURRENT DURATION**



## TYPICAL DEVICE CHARACTERISTICS

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

| PART NUMBER | DEVICE MARKING | REPETITIVE PEAK OFF-STATE VOLTAGE $V_{DRM}$ VOLTS | SWITCHING VOLTAGE @100V/µs $V_S$ VOLTS | MINIMUM HOLDING CURRENT (Fig. 7) di/dt = 1A/ms $I_H$ mA | SWITCHING CURRENT IS mA | MAXIMUM OFF-STATE CURRENT (Fig. 4) @$V_{DRM}$ $I_{DRM}$ µA | MAXIMUM ON-STATE VOLTAGE (Fig. 5) @$I_T$ $V_T$ VOLTS | ON-STATE CURRENT $I_T$ AMPS | TYPICAL CAPACITANCE (Note 1) @2V, 1MHz C pF |
|---|---|---|---|---|---|---|---|---|---|
| PP0080SA | GA | 6 | 25 | 50 | 800 | 5 | 4 | 2.2 | 50 |
| PP0300SA | GB | 25 | 40 | 50 | 800 | 5 | 4 | 2.2 | 60 |
| PP0640SA | GC | 58 | 77 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP0720SA | GD | 65 | 88 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP0800SA | GE | 75 | 98 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP1100SA | GF | 90 | 130 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP1300SA | GG | 120 | 160 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP1500SA | GH | 140 | 180 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP1800SA | GI | 160 | 220 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP2300SA | GJ | 190 | 260 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP2600SA | GK | 220 | 300 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP3100SA | GL | 275 | 350 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP3500SA | GM | 300 | 400 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP0080SB | FA | 6 | 25 | 50 | 800 | 5 | 4 | 2.2 | 60 |
| PP0300SB | GN | 25 | 40 | 50 | 800 | 5 | 4 | 2.2 | 110 |
| PP0640SB | GP | 58 | 77 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP0720SB | GQ | 65 | 88 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP0800SB | GR | 75 | 98 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP1100SB | GS | 90 | 130 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP1300SB | GT | 120 | 160 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP1500SB | GU | 140 | 180 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP1800SB | GV | 160 | 220 | 150 | 800 | 5 | 4 | 2.2 | 40 |
| PP2300SB | GW | 190 | 260 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP2600SB | GX | 220 | 300 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP3100SB | GY | 275 | 350 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP3500SB | GZ | 300 | 400 | 150 | 800 | 5 | 4 | 2.2 | 30 |
| PP0080SC | HA | 6 | 25 | 50 | 800 | 5 | 4 | 2.2 | 75 |
| PP0300SC | HB | 25 | 40 | 50 | 800 | 5 | 4 | 2.2 | 60 |
| PP0640SC | HC | 58 | 77 | 150 | 800 | 5 | 4 | 2.2 | 120 |
| PP0720SC | HD | 65 | 88 | 150 | 800 | 5 | 4 | 2.2 | 120 |
| PP0800SC | HE | 75 | 98 | 150 | 800 | 5 | 4 | 2.2 | 120 |
| PP1100SC | HF | 90 | 130 | 150 | 800 | 5 | 4 | 2.2 | 120 |
| PP1300SC | HG | 120 | 160 | 150 | 800 | 5 | 4 | 2.2 | 80 |

**NOTES**
1. Capacitance imblance between positive and negative polarities is typically < 15pF.

## TYPICAL DEVICE CHARACTERISTICS

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

| PART NUMBER | DEVICE MARKING | REPETITIVE PEAK OFF-STATE VOLTAGE $V_{DRM}$ VOLTS | SWITCHING VOLTAGE @100V/µs $V_S$ VOLTS | MINIMUM HOLDING CURRENT (Fig. 7) di/dt = 1A/ms $I_H$ mA | SWITCHING CURRENT IS mA | MAXIMUM OFF-STATE CURRENT (Fig. 4) @$V_{DRM}$ $I_{DRM}$ µA | MAXIMUM ON-STATE VOLTAGE (Fig. 5) @$I_T$ $V_T$ VOLTS | ON-STATE CURRENT $I_T$ AMPS | TYPICAL CAPACITANCE (Note 1) @2V, 1MHz C pF |
|---|---|---|---|---|---|---|---|---|---|
| PP1500SC | HH | 140 | 180 | 150 | 800 | 5 | 4 | 2.2 | 80 |
| PP1800SC | HI | 160 | 220 | 150 | 800 | 5 | 4 | 2.2 | 80 |
| PP2300SC | HJ | 190 | 260 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP2600SC | HK | 220 | 300 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP3100SC | HL | 275 | 350 | 150 | 800 | 5 | 4 | 2.2 | 60 |
| PP3500SC | HN | 300 | 400 | 150 | 800 | 5 | 4 | 2.2 | 60 |

**NOTES**
1. Capacitance imblance between positive and negative polarities is typically < 15pF.

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
TYPICAL PEAK OFF-STATE CURRENT
VS JUNCTION TEMPERATURE

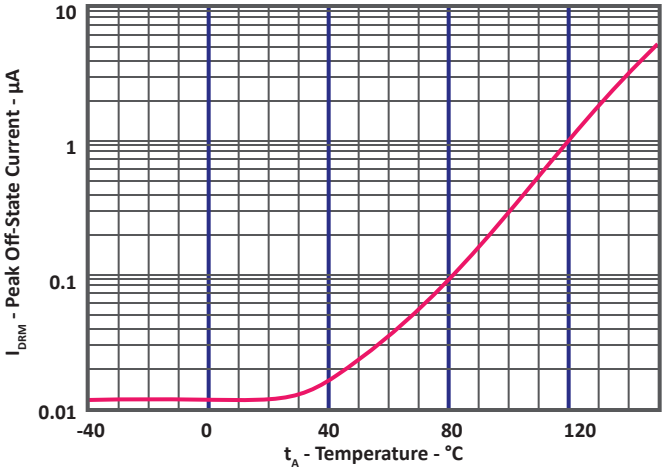



FIGURE 5
TYPICAL PEAK ON-STATE CURRENT
VS ON-STATE VOLTAGE

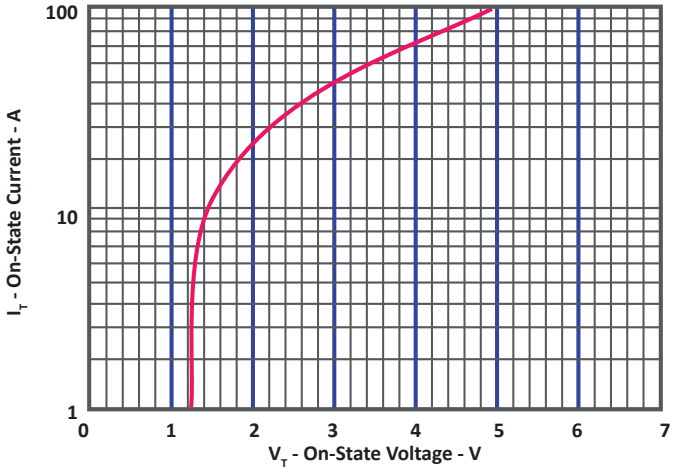



FIGURE 6
TYPICAL NORMALIZED SWITCHING VOLTAGE
VS JUNCTION TEMPERATURE

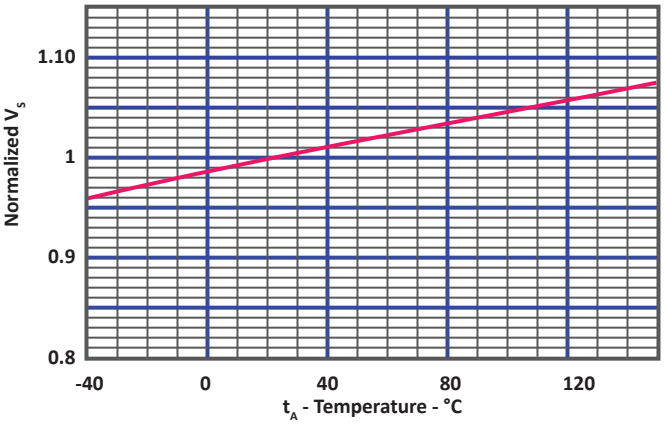
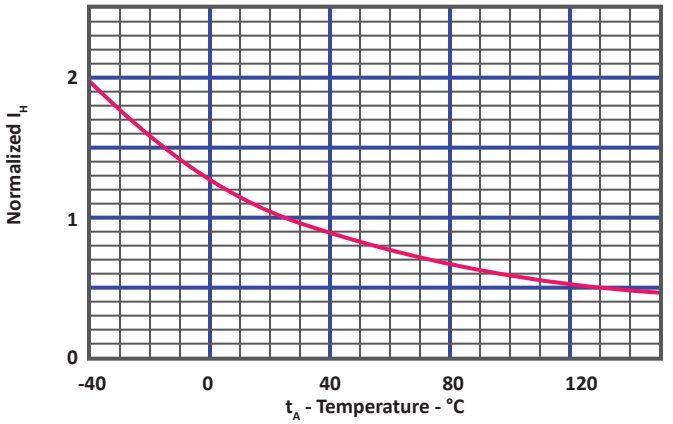


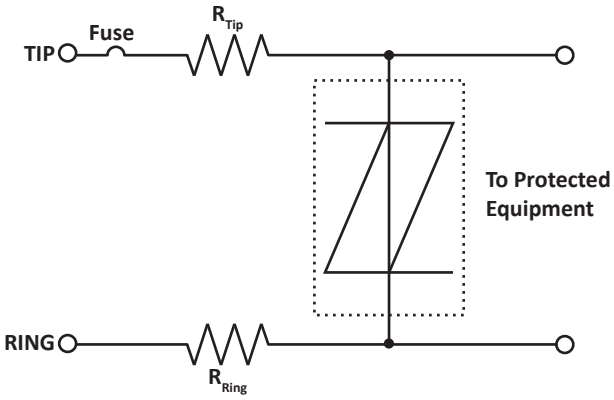

FIGURE 7
TYPICAL NORMALIZED HOLDING CURRENT
VS JUNCTION TEMPERATURE



## APPLICATION INFORMATION

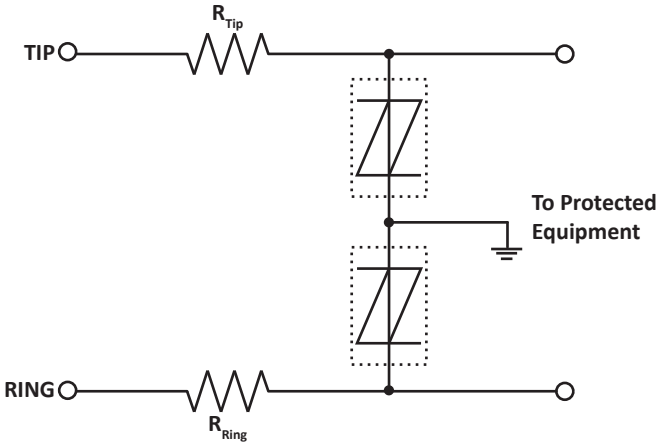
### FIGURE 1 - UL 1459 & FCC PART 68 METALLIC PROTECTION

The TSS (Thyristor Surge Suppressor) device is located across the tip-to-ring after a limiting resistor and fuse combination. RTIP and RRING resistors are optional depending upon the TSS device selection. Without the resistors, the PP3100SB/SC is recommended. However, with a resistance value of 7.5 Ohms for tip and ring, the PP3100SA is recommended. Digital signals may use a lower TSS device depending upon the total tip to ring voltage range. Selection of the TSS device, either PPxxxx-SA or SB/SC is based upon the value of the tip and ring resistors. For the National Electric Code (NEC) article 800, it is recommended that at least one fuse be used in the tip or ring line for metallic surges. Fuses may be replaced with a suitable Positive Temperature Coefficient (PTC) automatic resettable current limiting device.




### FIGURE 2 - UL 1459 & FCC PART 68 LONGITUDINAL PROTECTION

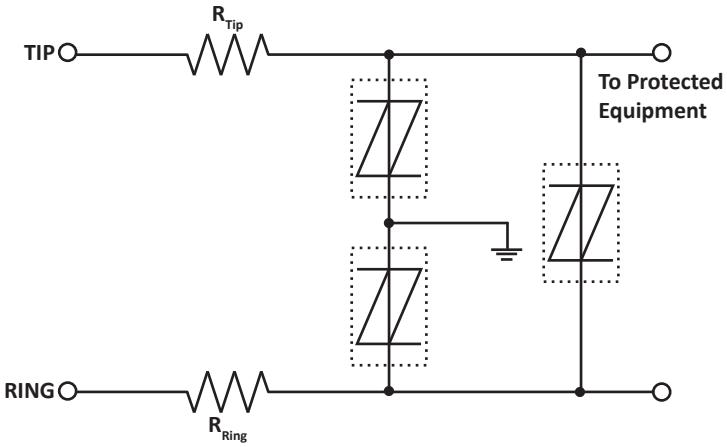
There are two TSS devices, one located from tip-to-ground and one ring-to-ground. For standard analog signals, the PP3100SA is recommended with a typical resistor value for tip and ring of 15 Ohms. The PP3100SB/SC is recommended for resistor values of 7.5 Ohms each. The National Electric Code (NEC) article 800 requires two fuse elements when connecting to ground. Fuses or a suitable Positive Temperature Coefficient (PTC) automatic resettable current limiting device may be used. The purpose of this circuit is to limit AC power current from getting on the ground line causing any safety hazard.



## APPLICATION INFORMATION

### FIGURE 3 - UL 1459 & FCC PART 68 METALLIC & LONGITUDINAL PROTECTION

Three equal TSS devices are used in this application for metallic (tip-to-ring) and longitudinal (tip-to-ground and ring-to-ground) protection. For analog signals, the PP3100SB/SC is recommended. With a resistance value of 15 Ohms for the tip and ring resistors, the PP3100SA may be used. The National Electric Code (NEC) article 800 requires two fuse elements when connecting to ground. Fuses or a suitable Positive Temperature Coefficient (PTC) automatic resettable current limiting device may be used. This circuit is recommended for protection against the Bellcore requirement: First Level Lightning Surge Tests (Telecommunications Port), document # GR-1089-CORE.




## CIRCUIT BOARD RECOMMENDATIONS

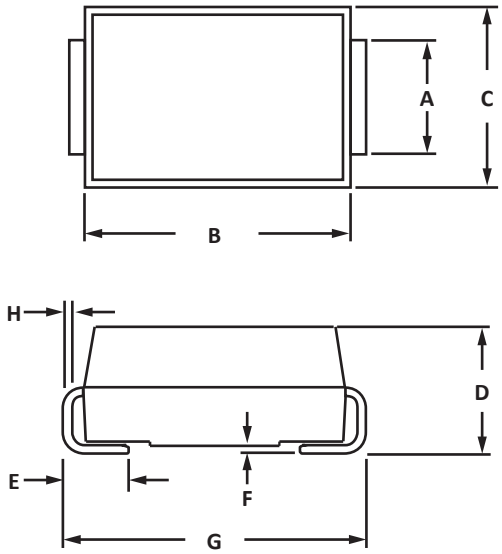
Circuit board layout is critical for electromagnetic compatibility protection. The following guidelines are recommended:

- 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.

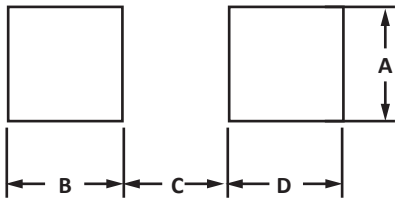
## DO-214AA PACKAGE INFORMATION

| OUTLINE DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 1.96 | 2.21 | 0.077 | 0.087 |
| B | 4.06 | 4.57 | 0.160 | 0.180 |
| C | 3.30 | 3.94 | 0.130 | 0.155 |
| D | 2.00 | 2.50 | 0.079 | 0.098 |
| E | 0.76 | 1.52 | 0.030 | 0.060 |
| F | 0.10 | 0.20 | 0.004 | 0.008 |
| G | 5.08 | 5.59 | 0.200 | 0.220 |
| H | 0.15 | 031 | 0.006 | 0.012 |

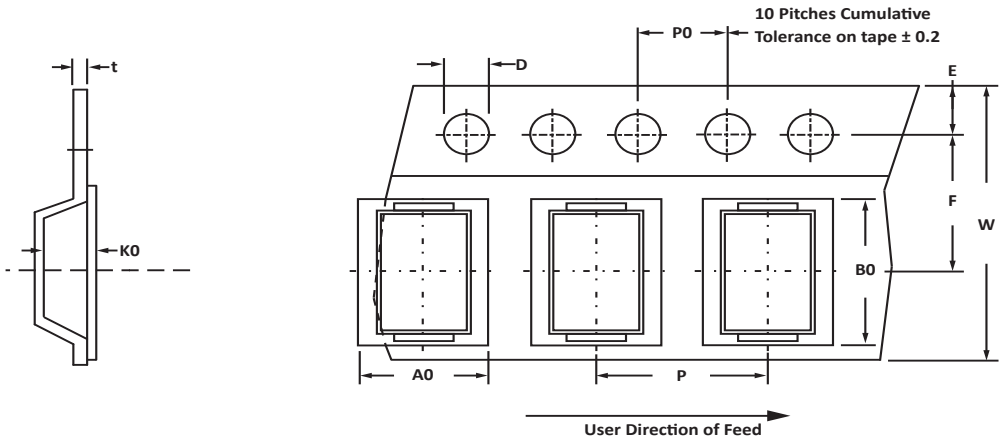
**NOTES**
1. Dimensions are exclusive of mold flash and metal burrs.




| PAD LAYOUT DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 2.15 | - | 0.084 | - |
| B | 1.45 | - | 0.057 | - |
| C | - | 2.55 | - | 0.100 |
| D | 1.45 | - | 0.057 | - |



## TAPE AND REEL




| SPECIFICATIONS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P | tmax |
| 330mm (13") | 12mm | 3.79 ± 0.15 | 5.72 ± 0.15 | 2.46 ± 0.30 | 1.55 ± 0.05 | 1.75 ± 0.10 | 5.5 ± 0.05 | 12.00 ± 0.30 | 4.00 ± 0.10 | 8.00 ± 0.10 | 0.25 ± 0.10 |

**NOTES**
1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T = 13" Reel - 3,000 pieces per 12mm tape.
4. Marking on Part - marking code (see page 2) and logo.

| ORDERING INFORMATION | | | | | |
|---|---|---|---|---|---|
| BASE PART NUMBER | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
| PPxxxxSA/SB/SC | -LF | -T | 3,000 | 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.

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