

## MINIATURE TVS ARRAY



### DESCRIPTION

The P5V0S1UL is a transient voltage suppressor array (TVS) designed to protect applications such as wireless telecommunication devices and portable electronics. The P5V0S1UL is available in a unidirectional configuration with a working voltage of 5.0V and a minimum breakdown voltage of 6.0V. This device is rated for 150 Watt peak pulse power using the 8/20 $\mu$ s waveform, which is sufficient protection for tertiary type lightning threats at key interface locations.

The P5V0S1UL is also suited to protect data lines against ESD and EFT. This device meets the IEC 61000-4-2 and IEC 61000-4 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
- 150 Watts Peak Pulse Power per Line (tp = 8/20 $\mu$ s)
- ESD Protection > 25 kilovolts
- Cable Discharge Event (CDE) Protection
- Unidirectional Configuration
- Provides 1 Line of Protection
- RoHS Compliant
- REACH Compliant

### APPLICATIONS

- Ethernet 10/100/1000 Base T
- SMART Phones
- Portable Electronics
- USB Interfaces

### MECHANICAL CHARACTERISTICS

- Molded JEDEC DFN-2-0402 Package
- Approximate Weight: 0.8 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

### PIN CONFIGURATION



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

| PARAMETER                                     | SYMBOL    | VALUE      | UNITS |
|---|-----------|------------|-------|
| Operating Temperature                         | $T_A$     | -55 to 150 | °C    |
| Storage Temperature                           | $T_{STG}$ | -55 to 150 | °C    |
| Peak Pulse Power (tp = 8/20µs) - See Figure 1 | $P_{PP}$  | 150        | Watts |
| Peak Pulse Current (tp = 8/20µs)              | $I_{PP}$  | 10         | A     |
| Soldering Temperature for 10 seconds          | $T_L$     | 265        | °C    |
| Typical Forward Voltage @ 10mA                | $V_F$     | 0.8        | V     |

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

| PART NUMBER | DEVICE MARKING | RATED STAND-OFF VOLTAGE<br><br>$V_{WM}$<br>VOLTS | MINIMUM BREAKDOWN VOLTAGE<br><br>@ 1mA<br>$V_{(BR)}$<br>VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2)<br><br>@ $I_p = 1A$<br>$V_C$<br>VOLTS | MAXIMUM LEAKAGE CURRENT<br><br>@ $V_{WM}$<br>$I_D$<br>µA | TYPICAL CAPACITANCE<br><br>@ 0V, 1MHz<br>C<br>pF |
|-------------|----------------|--|---|---|--|--|
| P5V0S1UL    | 5              | 5.0  | 6.0   | 9.8   | 1.0  | 70   |

## TYPICAL DEVICE CHARACTERISTICS

FIGURE 1  
PEAK PULSE POWER VS PULSE TIME

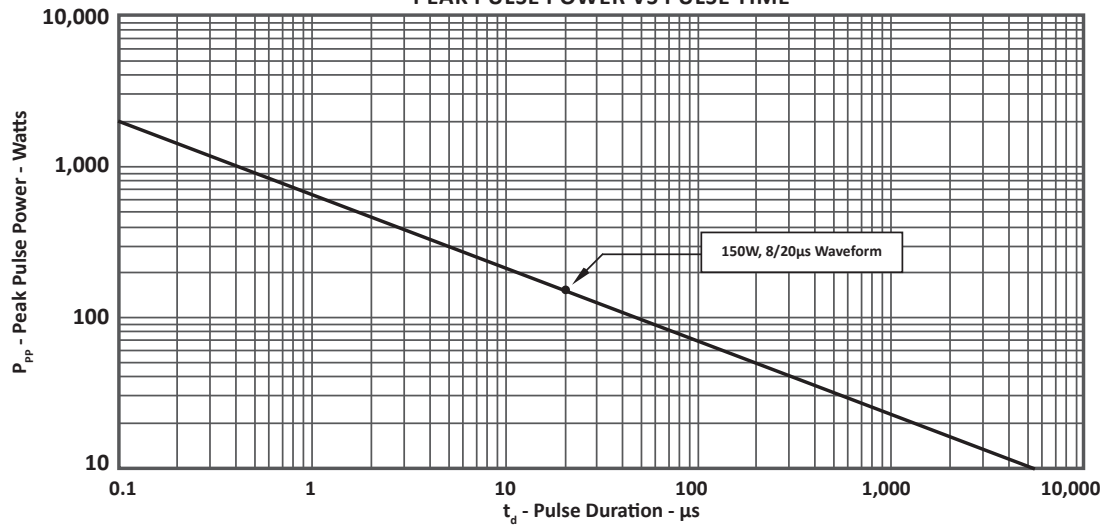
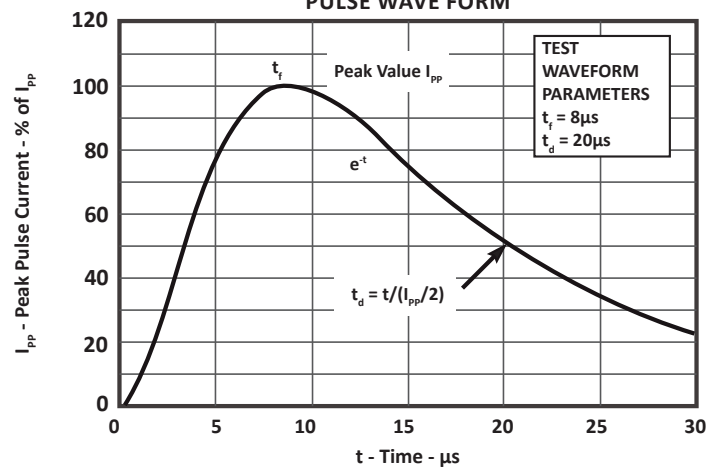


FIGURE 2  
PULSE WAVE FORM



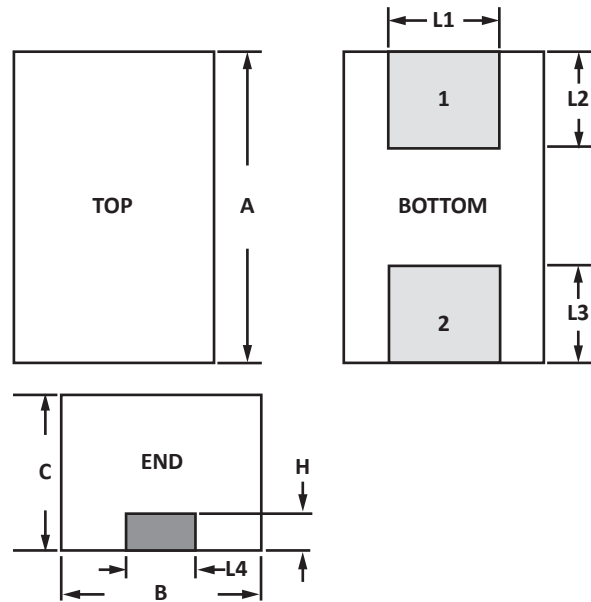
## DFN-2-0402 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

| DIM | MILLIMETERS |      | INCHES |       |
|-----|-------------|------|--------|-------|
|     | MIN         | MAX  | MIN    | MAX   |
| A   | 0.99        | 1.04 | 0.039  | 0.041 |
| B   | 0.58        | 0.64 | 0.023  | 0.025 |
| C   | 0.43        | 0.48 | 0.017  | 0.019 |
| H   | 0.13        | 0.18 | 0.005  | 0.007 |
| L1  | 0.28        | 0.33 | 0.011  | 0.013 |
| L2  | 0.23        | 0.28 | 0.009  | 0.011 |
| L3  | 0.23        | 0.28 | 0.009  | 0.011 |
| L4  | 0.18        | 0.23 | 0.007  | 0.009 |

## NOTES

1. Dimensioning and tolerances per ANSI Y14.M, 1985.
2. Controlling dimension: inches.

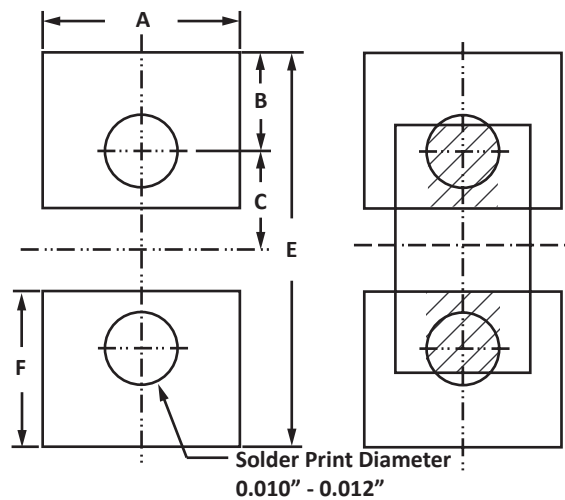


## PAD LAYOUT DIMENSIONS

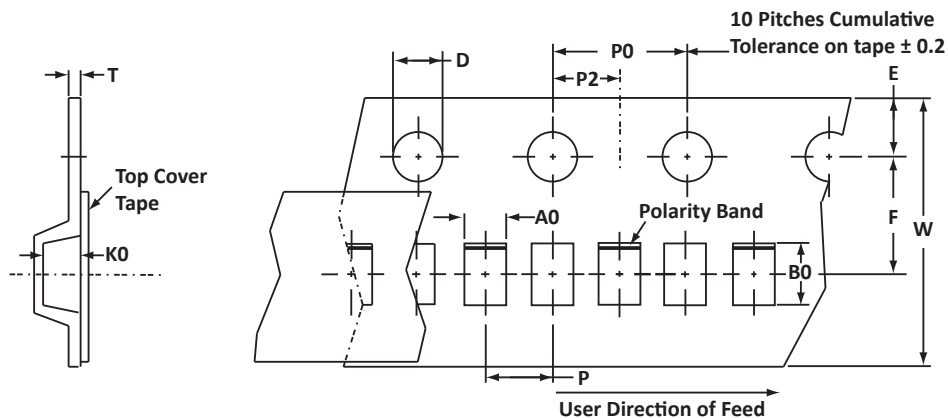
| DIM | MILLIMETERS |       | INCHES |       |
|-----|-------------|-------|--------|-------|
|     | MIN         | MAX   | MIN    | MAX   |
| A   | 0.737       | 0.787 | 0.029  | 0.031 |
| B   | 0.331       | 0.381 | 0.013  | 0.015 |
| C   | 0.356       | 0.406 | 0.014  | 0.016 |
| E   | 1.423       | 1.523 | 0.056  | 0.060 |
| F   | 0.534       | 0.584 | 0.021  | 0.023 |

## NOTES

1. Controlling dimension: inches.
2. Decimal tolerances for mounting pad:  $\pm 0.003''$  ( $\pm 0.08$  mm).



## TAPE AND REEL



## SPECIFICATIONS

| REEL DIA.  | TAPE WIDTH | A0          | B0          | K0           | D           | E           | F           | W           | P0          | P2          | P           | tmax |
|------------|------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| 178mm (7") | 8mm        | 0.70 ± 0.05 | 1.15 ± 0.05 | 0.60 ± 0.003 | 1.55 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ± 0.30 | 4.00 ± 0.10 | 2.00 ± 0.05 | 2.00 ± 0.05 | 0.25 |

## NOTES

1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Empty pocket underneath sprocket holes.
4. Polarity Band on unidirectional devices only.
5. Suffix - T75 = 7" Reel - 5,000 pieces per 8mm tape (sprocket hole skipped).
6. Marking on Part - marking code (see page 2) and polarity band.

Package outline, pad layout and tape specifications per document number 06094.R1 3/11 - Option 1.

## ORDERING INFORMATION

| BASE PART NUMBER | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------|-----------------|-------------|----------|-----------|----------|
| P5V0S1UL         | n/a             | -T75        | 5,000    | 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 ISO 9001:2015 certified.

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