

## 2-Line Ultra-Low Capacitance TVS Diode Array

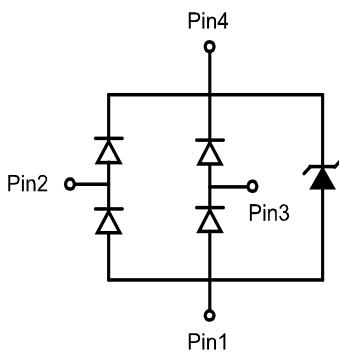
### Description

The PESDR0552S1 is a 2-line ultra-low capacitance TVS diode array, to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The PESDR0552S1 has a very low capacitance with a typical value at 0.4pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a 4-pin SOT-143 lead-free package. The small size, very low capacitance and high ESD protection make PESDR0552S1 an ideal choice to protect cell phone, digital video interfaces, high speed data ports, and many other portable applications.

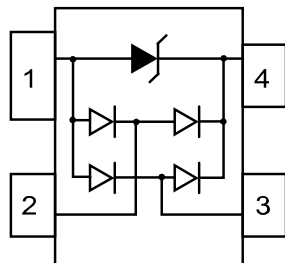
### Features

- Ultra low capacitance: 0.4pF typical IO to IO
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- 4-pin SOT-143 package
- Protects two data lines and one power line
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-5 (Lightning) 6A (8/20 $\mu\text{s}$ )
- RoHS Compliant

### Dimensions and Pin Configuration



Circuit Diagram



Pin Schematic

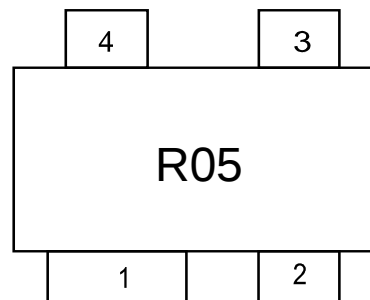
### Mechanical Characteristics

- Package: SOT-143
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound
- Marking Information: See Below

### Applications

- FireWire & USB
- Sensitive Analog Inputs
- Portable Electronics
- LAN/WAN equipment
- Video Line Protection
- Microcontroller Input Protection

### Marking Information



**R05**= Device Marking Code

Pin1 is ground

### Ordering Information

| Part Number | Shipping         | Reel Size |
|-------------|------------------|-----------|
| PESDR0552S1 | 3000/Tape & Reel | 7 inch    |

**Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)**

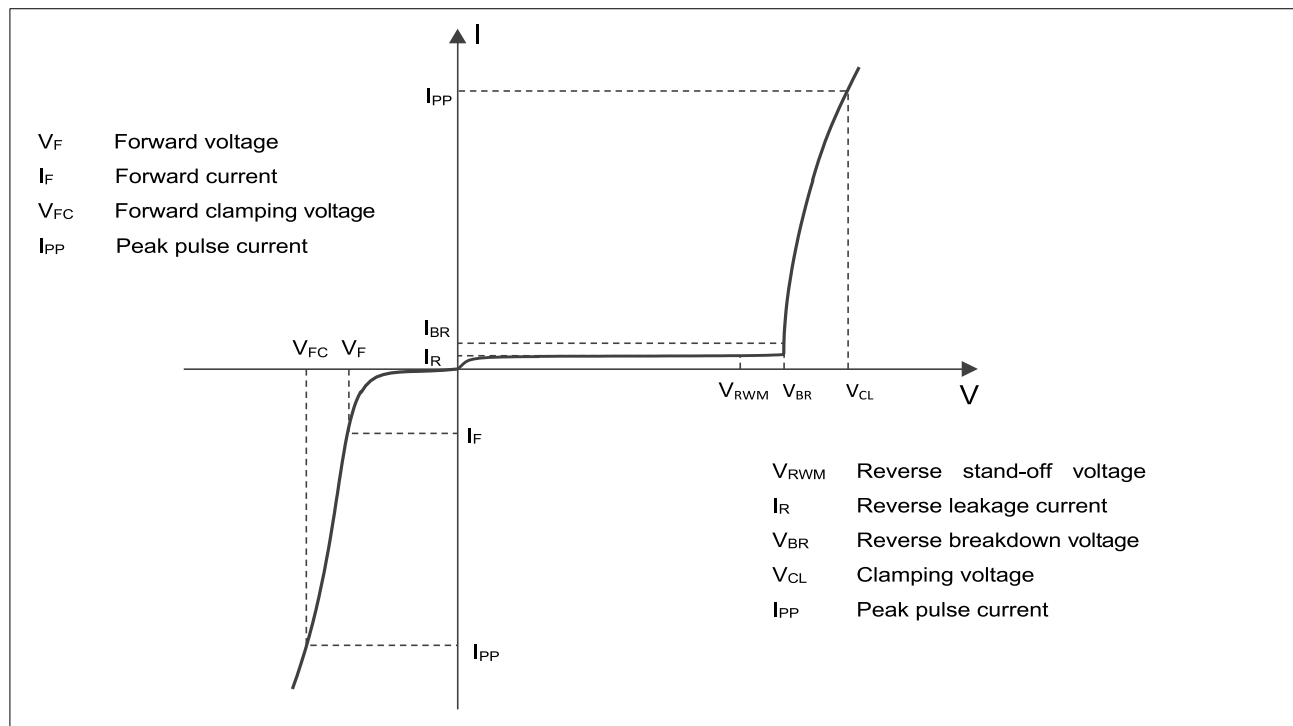
| Parameter                       | Symbol           | Value      | Unit |
|---------------------------------|------------------|------------|------|
| Peak Pulse Power (8/20μs)       | P <sub>PK</sub>  | 100        | W    |
| Peak Pulse Current (8/20μs)     | I <sub>PP</sub>  | 6          | A    |
| ESD per IEC 61000-4-2 (Air)     | V <sub>ESD</sub> | ±30        | kV   |
| ESD per IEC 61000-4-2 (Contact) |                  | ±30        |      |
| Lead temperature                | T <sub>L</sub>   | 260        | °C   |
| Junction Temperature            | T <sub>J</sub>   | 125        | °C   |
| Operating Temperature Range     | T <sub>OP</sub>  | -40 ~ +125 | °C   |
| Storage Temperature Range       | T <sub>STG</sub> | -55 ~ +150 | °C   |

**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)**

| Parameter               | Symbol           | Min. | Typ. | Max. | Unit | Test Condition                                             |
|-------------------------|------------------|------|------|------|------|------------------------------------------------------------|
| Reverse Working Voltage | V <sub>RWM</sub> |      |      | 5    | V    | Any I/O pin to ground                                      |
| Breakdown Voltage       | V <sub>BR</sub>  | 6    |      |      | V    | I <sub>T</sub> = 1mA, any I/O pin to ground                |
| Reverse Leakage Current | I <sub>R</sub>   |      |      | 0.1  | uA   | V <sub>RWM</sub> = 5V, any I/O pin to ground               |
| Clamping Voltage        | V <sub>C</sub>   |      |      | 10   | V    | I <sub>PP</sub> = 1A (8/20μs pulse), any I/O pin to ground |
| Clamping Voltage        | V <sub>C</sub>   |      |      | 20   | V    | I <sub>PP</sub> = 6A (8/20μs pulse), any I/O pin to ground |
| Junction Capacitance    | C <sub>J</sub>   |      | 0.4  | 0.45 | pF   | V <sub>R</sub> = 0V, f = 1MHz, between I/O pins            |
| Junction Capacitance    | C <sub>J</sub>   |      | 0.8  | 0.9  | pF   | V <sub>R</sub> = 0V, f = 1MHz, any I/O pin to ground       |

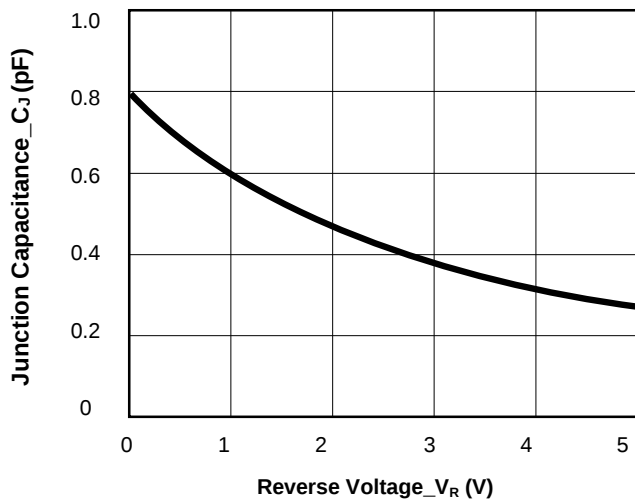
Note 1: I/O pins are pin 2 & 3

**Electrical characteristics ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)**

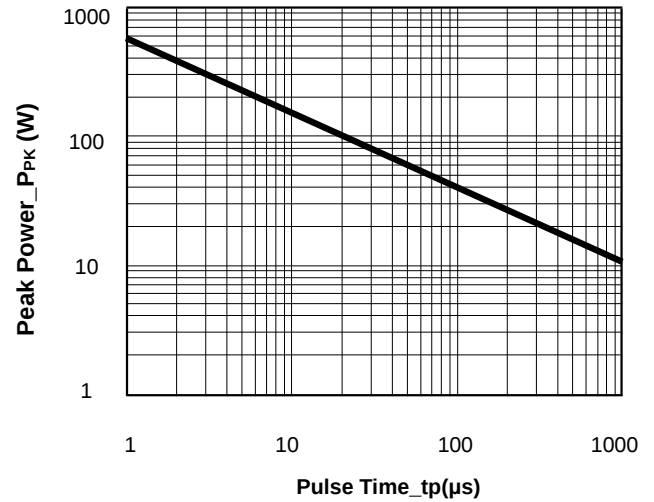


Definitions of electrical characteristics

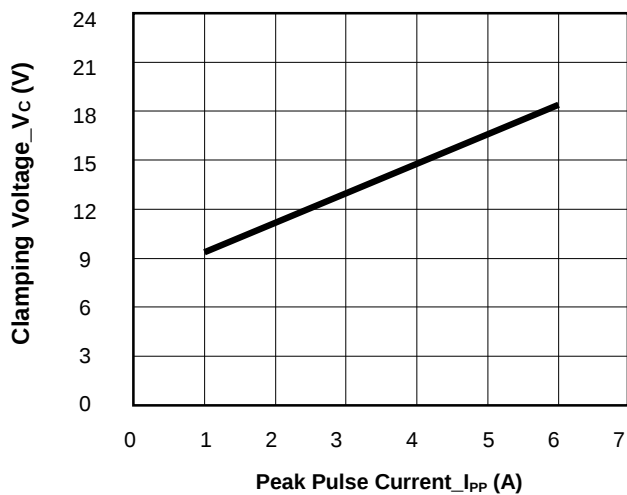
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**



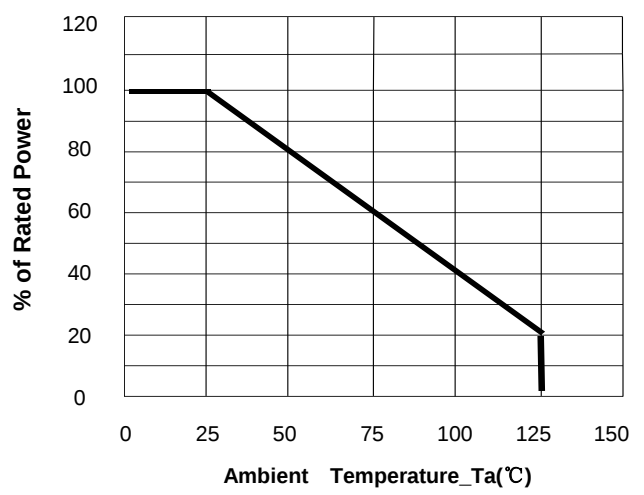
**Junction Capacitance vs. Reverse Voltage**



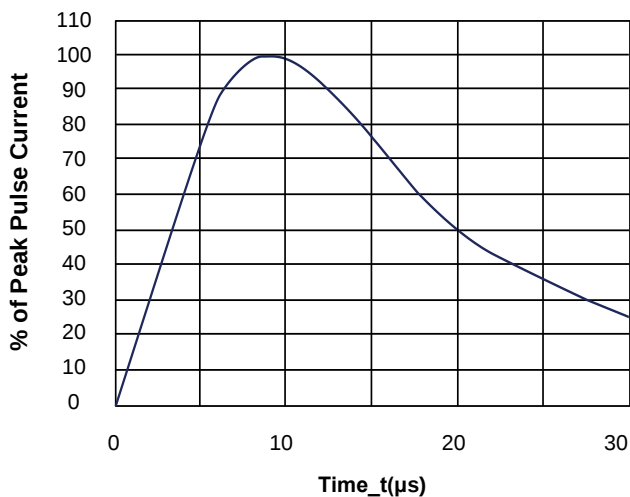
**Peak Pulse Power vs. Pulse Time**



**Clamping Voltage vs. Peak Pulse Current**

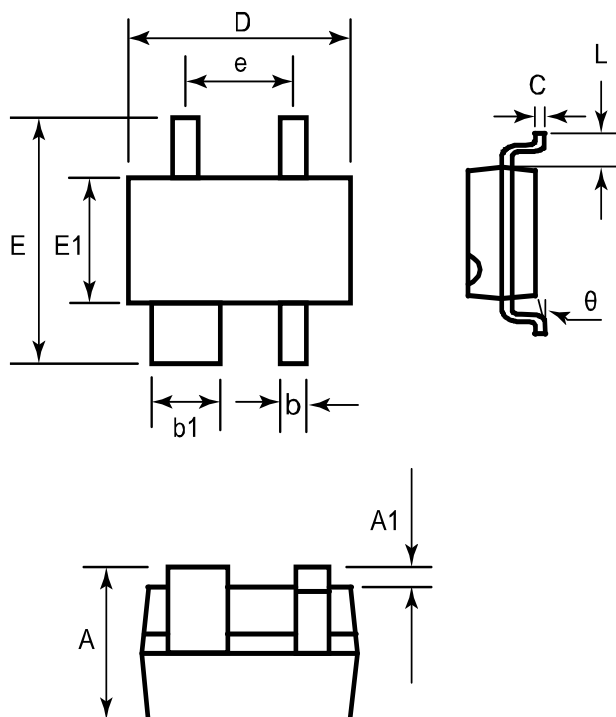


**Power Derating Curve**



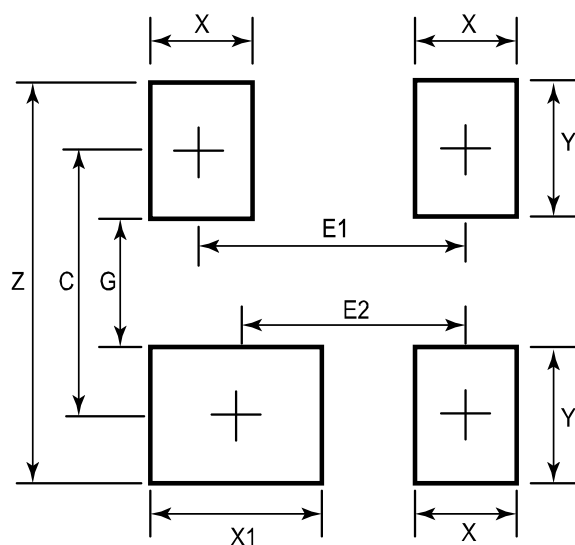
**8/20 $\mu\text{s}$  Pulse Waveform**

## SOT-143 Package Outline Drawing



| SYM | DIMENSIONS  |      |      |          |       |       |
|-----|-------------|------|------|----------|-------|-------|
|     | MILLIMETERS |      |      | INCHES   |       |       |
|     | MIN         | NOM  | MAX  | MIN      | NOM   | MAX   |
| A   | 0.80        |      | 1.22 | 0.031    |       | 0.048 |
| A1  | 0.013       |      | 0.15 | 0.00     |       | 0.006 |
| b   | 0.30        |      | 0.51 | 0.011    |       | 0.020 |
| b1  | 0.76        |      | 0.94 | 0.029    |       | 0.037 |
| C   | 0.08        |      | 0.20 | 0.003    |       | 0.008 |
| D   | 2.80        | 2.90 | 3.04 | 0.110    | 0.114 | 0.120 |
| E   | 2.10        | 2.37 | 2.64 | 0.082    | 0.093 | 0.104 |
| E1  | 1.20        | 1.30 | 1.40 | 0.047    | 0.051 | 0.055 |
| e   | 1.92 BSC    |      |      | 0.075BSC |       |       |
| L   | 0.54 BSC    |      |      | 0.021BSC |       |       |
| θ   | 0°          |      | 8°   | 0°       |       | 8°    |

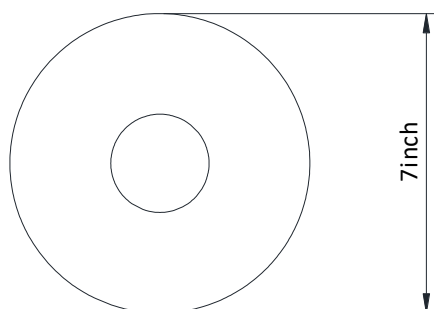
## Suggested Land Pattern



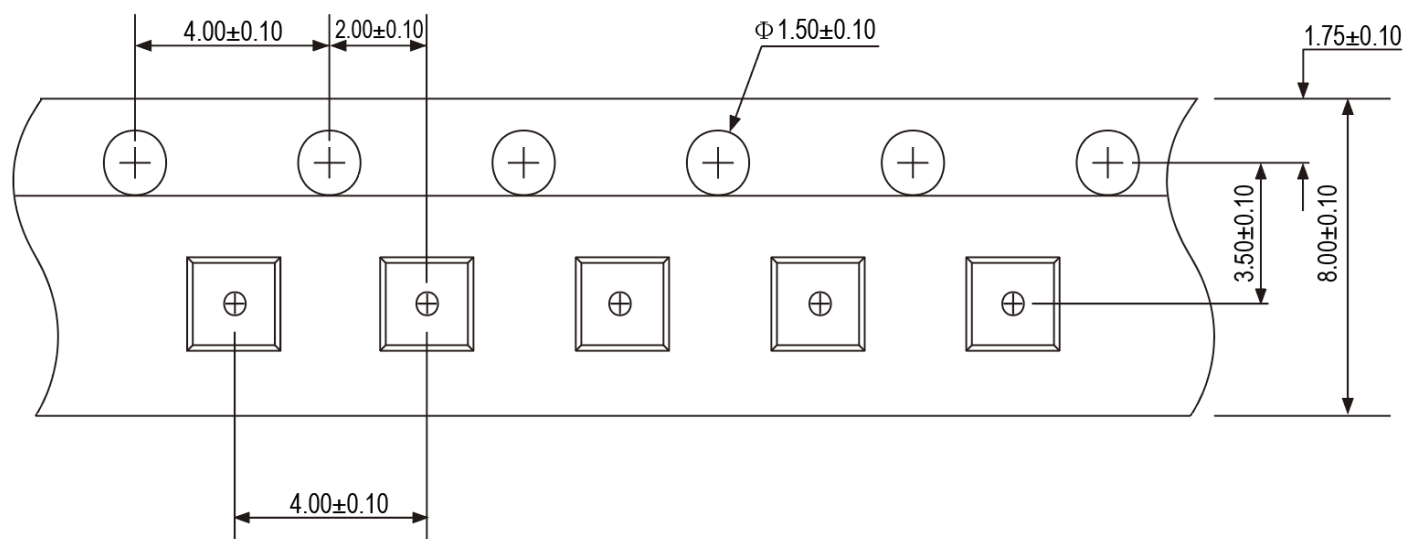
| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| C   | 2.20        | 0.087  |
| E1  | 1.92        | 0.076  |
| E2  | 1.72        | 0.068  |
| G   | 0.80        | 0.031  |
| X   | 1.00        | 0.039  |
| X1  | 1.20        | 0.047  |
| Y   | 1.40        | 0.055  |
| Z   | 3.60        | 0.141  |

**TAPE AND REEL INFORMATION**

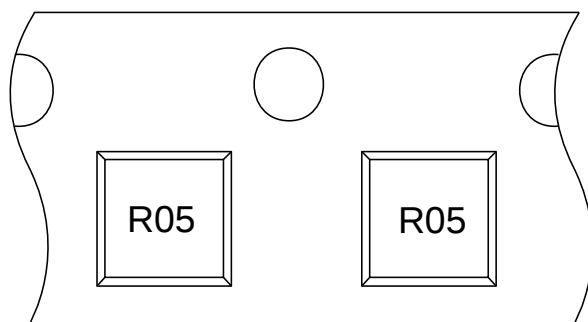
Reel Dimensions



Tape Dimensions



Unit:mm



User Direction of Feed

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