

## 1-Line Bi-directional TVS Diode

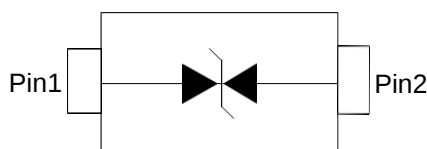
### Description

The PESDU2021D5 is a 20V bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The PESDU2021D5 complies with the IEC 61000-4-2 (ESD) with  $\pm 30$  kV air and  $\pm 30$  kV contact discharge. It is assembled into an ultra-small lead-free SOD-523 package. The small size and high ESD surge protection make PESDU2021D5 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

### Features

- Protects one data or power line
- Ultra low leakage: nA level
- Operating voltage: 20V
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30$  kV
    - Contact discharge:  $\pm 30$  kV
  - IEC 61000-4-5 (Lightning) 4A (8/20 $\mu$ s)
- RoHS Compliant

### Schematic and Pin Configuration



Graphic symbol

### Mechanical Characteristics

- Package: SOD-523
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Marking Information: See Below

### Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players

### Marking Information



**DE** = Device Marking Code

### Ordering Information

| Part Number | Shipping         | Reel Size |
|-------------|------------------|-----------|
| PESDU2021D5 | 3000/Tape & Reel | 7 inch    |

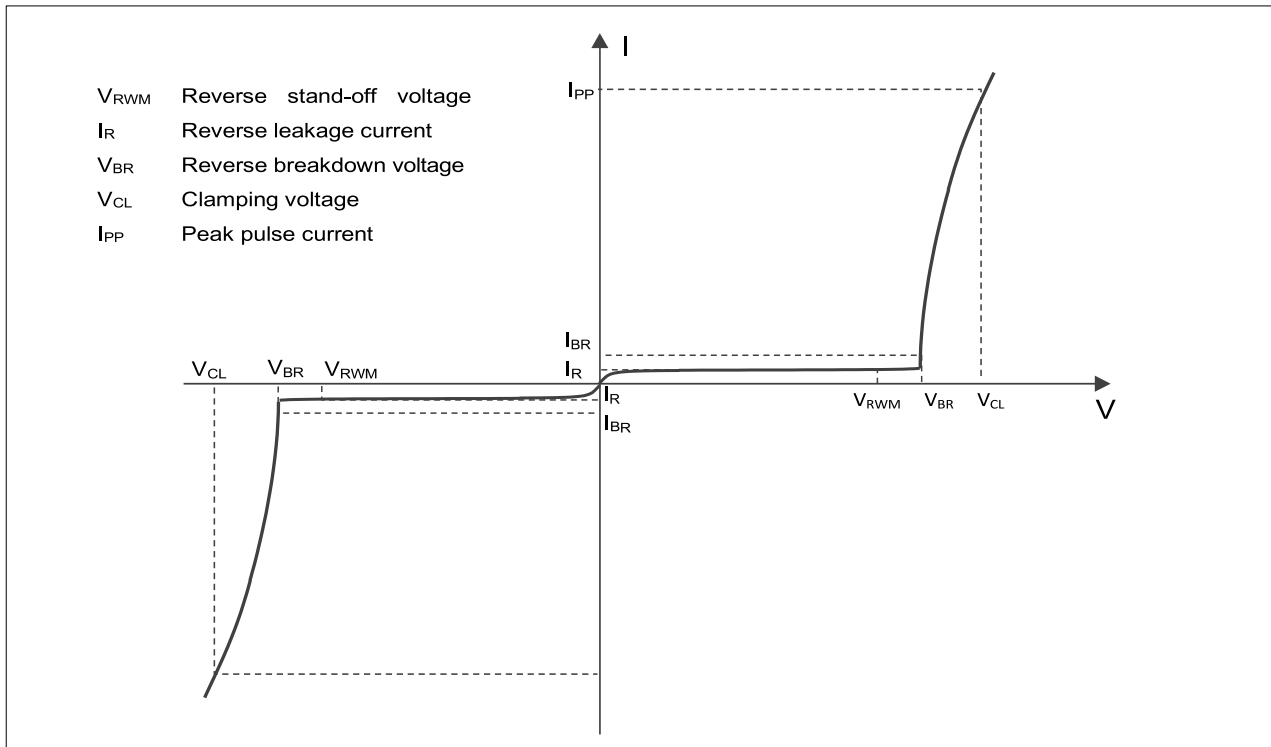
**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

| Parameter                                | Symbol    | Value           | Unit               |
|------------------------------------------|-----------|-----------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | $P_{pk}$  | 144             | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | $I_{PP}$  | 4               | A                  |
| ESD per IEC 61000-4-2 (Air)              | $V_{ESD}$ | $\pm 30$        | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |           | $\pm 30$        |                    |
| Lead temperature                         | $T_L$     | 260             | $^{\circ}\text{C}$ |
| Junction Temperature                     | $T_J$     | 125             | $^{\circ}\text{C}$ |
| Operating Temperature Range              | $T_{OP}$  | $-40 \sim +125$ | $^{\circ}\text{C}$ |
| Storage Temperature Range                | $T_{STG}$ | $-55 \sim +150$ | $^{\circ}\text{C}$ |

**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

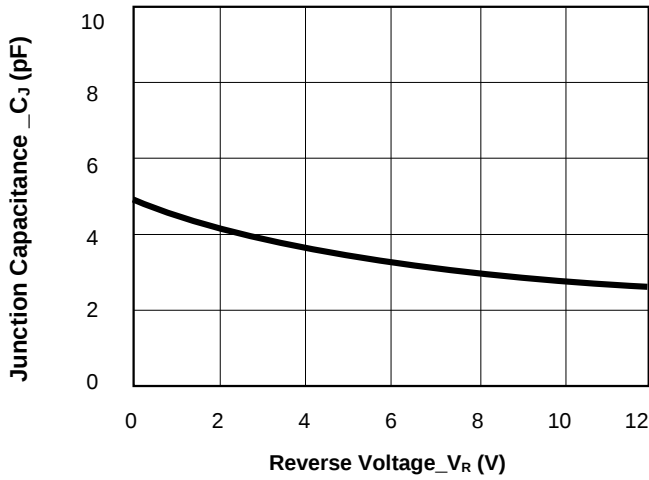
| Parameter               | Symbol    | Min. | Typ. | Max. | Unit          | Test Condition                                  |
|-------------------------|-----------|------|------|------|---------------|-------------------------------------------------|
| Reverse Working Voltage | $V_{RWM}$ |      |      | 20   | V             |                                                 |
| Breakdown Voltage       | $V_{BR}$  | 24   |      | 31.5 | V             | $I_T = 1\text{mA}$                              |
| Reverse Leakage Current | $I_R$     |      |      | 0.1  | $\mu\text{A}$ | $V_{RWM} = 20\text{V}$                          |
| Clamping Voltage        | $V_C$     |      |      | 28   | V             | $I_{PP} = 1\text{A}$ (8/20 $\mu\text{s}$ pulse) |
| Clamping Voltage        | $V_C$     |      |      | 36   | V             | $I_{PP} = 4\text{A}$ (8/20 $\mu\text{s}$ pulse) |
| Junction Capacitance    | $C_J$     |      | 5    |      | pF            | $V_R = 0\text{V}$ , $f = 1\text{MHz}$           |

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

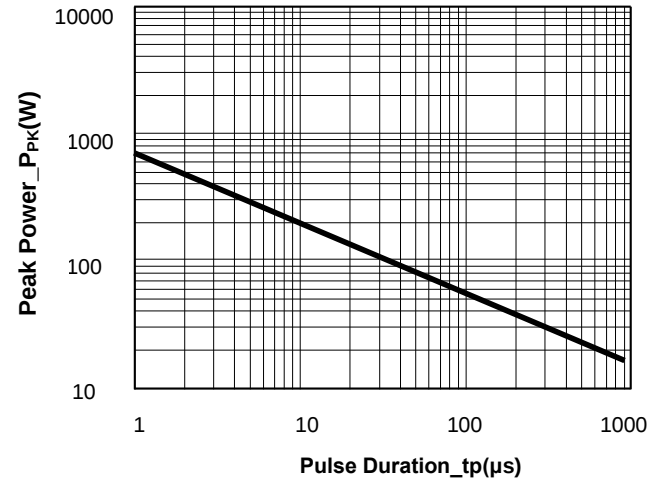


Definitions of electrical characteristics

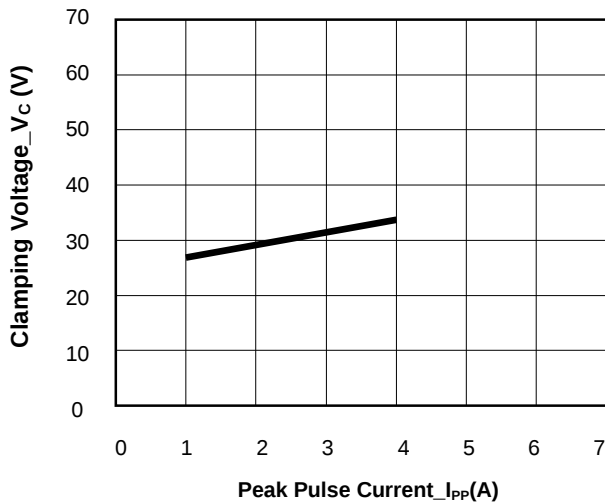
**Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)**



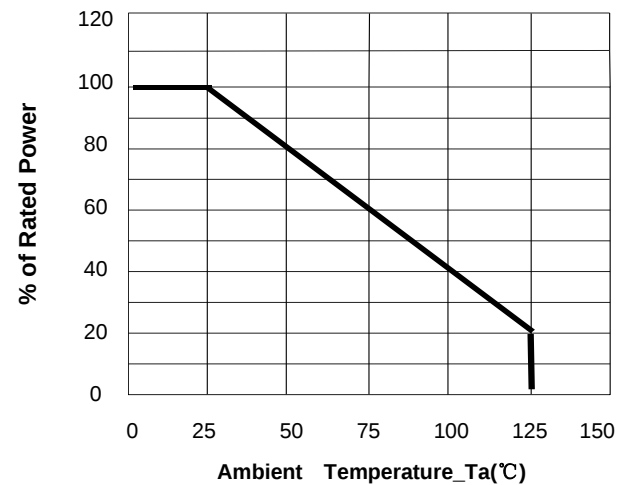
**Junction Capacitance vs. Reverse Voltage**



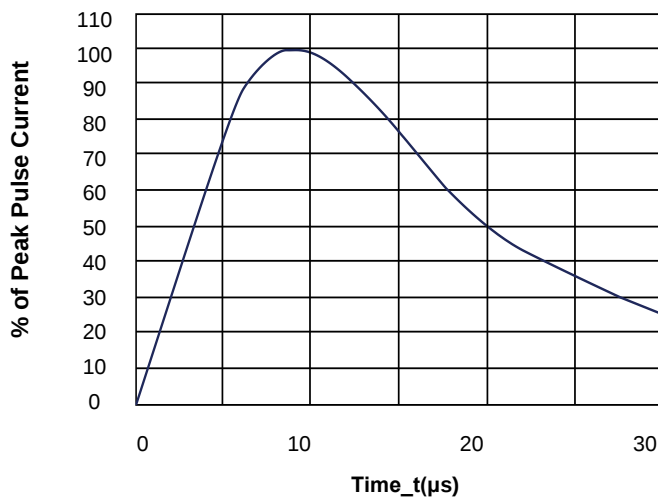
**Peak Pulse Power vs. Pulse Time**



**Clamping Voltage vs. Peak Pulse Current**

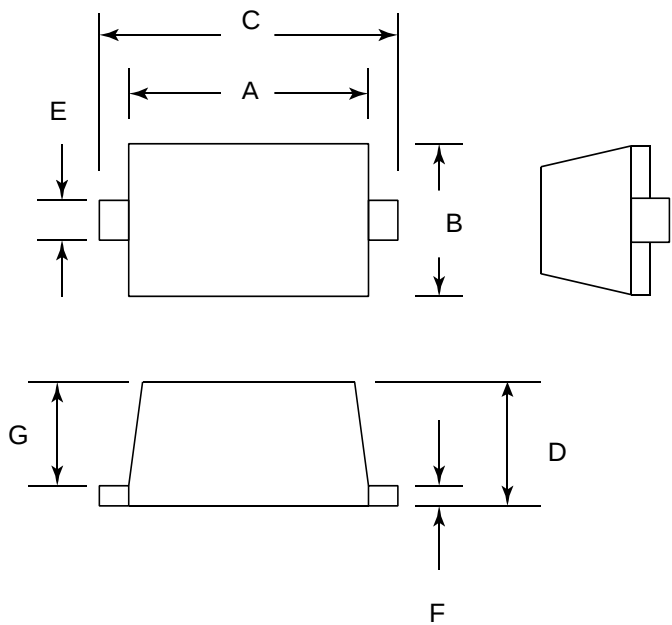


**Power Derating Curve**



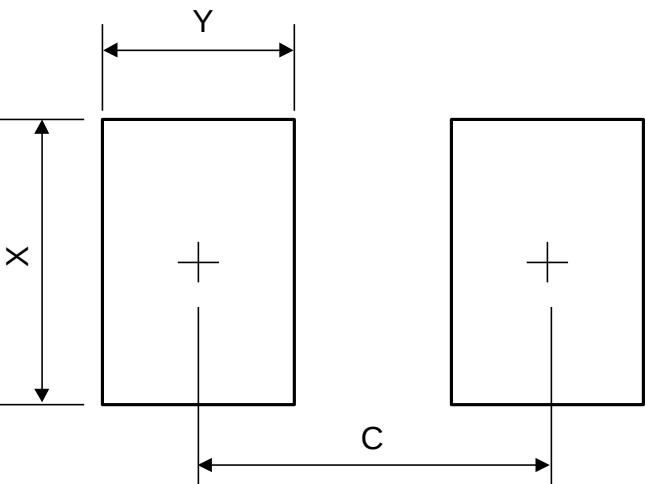
**8/20 $\mu\text{s}$  Pulse Waveform**

**SOD523 Package Outline Drawing**



| SYM | DIMENSIONS  |       |        |       |
|-----|-------------|-------|--------|-------|
|     | MILLIMETERS |       | INCHES |       |
|     | MIN         | MAX   | MIN    | MAX   |
| A   | 1.10        | 1.30  | 0.043  | 0.051 |
| B   | 0.70        | 0.90. | 0.028  | 0.035 |
| C   | 1.50        | 1.70  | 0.059  | 0.067 |
| D   | 0.50        | 0.70  | 0.020  | 0.028 |
| E   | 0.25        | 0.35  | 0.010  | 0.014 |
| F   | 0.10        | 0.20  | 0.004  | 0.008 |
| G   | 0.40        | 0.50  | 0.016  | 0.020 |

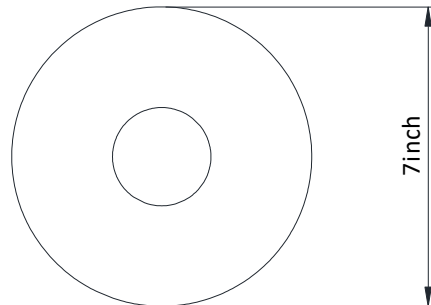
**Suggested Land Pattern**



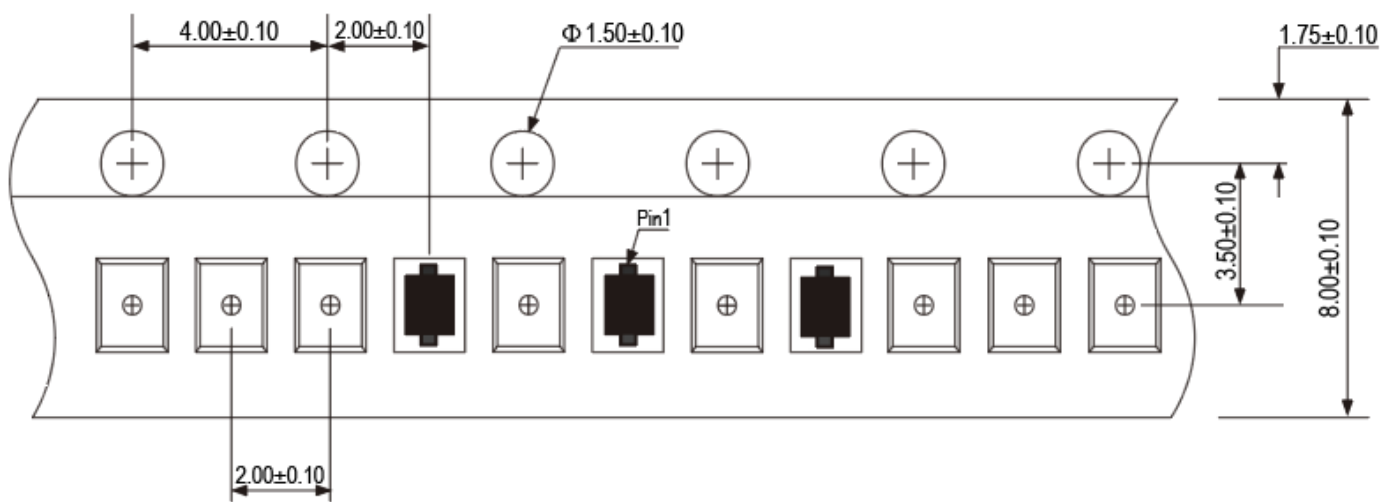
| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| C   | 1.42        | 0.056  |
| X   | 0.70        | 0.028  |
| Y   | 0.60        | 0.024  |

## TAPE AND REEL INFORMATION

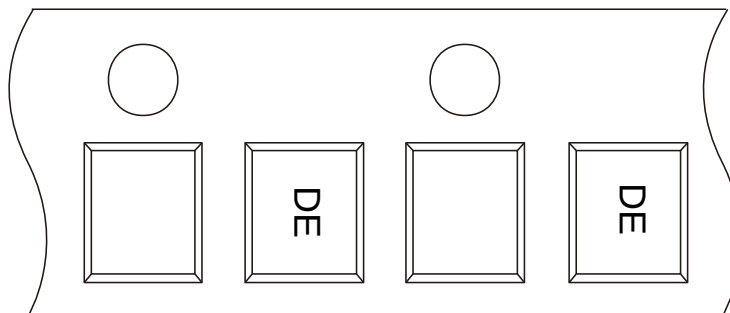
Reel Dimensions



Tape Dimensions



Unit:mm



User Direction of Feed

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