

## 1-Line Bi-directional TVS Diode

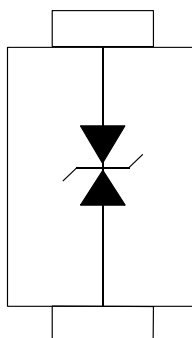
### Description

The PESDU1281D1F is a bi-directional TVS diode to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power lines. The PESDU1281D1F complies with the IEC 61000-4-2 (ESD) standard with  $\pm 30\text{kV}$  and air  $\pm 30\text{kV}$  contact discharge. It is assembled into a SOD-123FL lead-free package. The small size and high ESD protection make PESDU1281D1F an ideal choice to protect cellphone, digital cameras, audio players and many other portable applications.

### Features

- Protects one data or power line
- Ultra low leakage: nA level
- Low operating voltage: 12V
- Ultra low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC 61000-4-5 (Lightning) 160A (8/20 $\mu\text{s}$ )
- RoHS Compliant

### Pin Configuration



Circuit and Pin Schematic

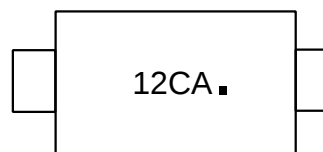
### Mechanical Characteristics

- Package: SOD-123FL
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below

### Applications

- Fast-charge battery chargers
- Power management system
- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals

### Marking Information



**12CA.** = Device Marking Code

### Ordering Information

| Part Number  | Shipping         | Real Size |
|--------------|------------------|-----------|
| PESDU1281D1F | 3000/Tape & Reel | 7 inch    |

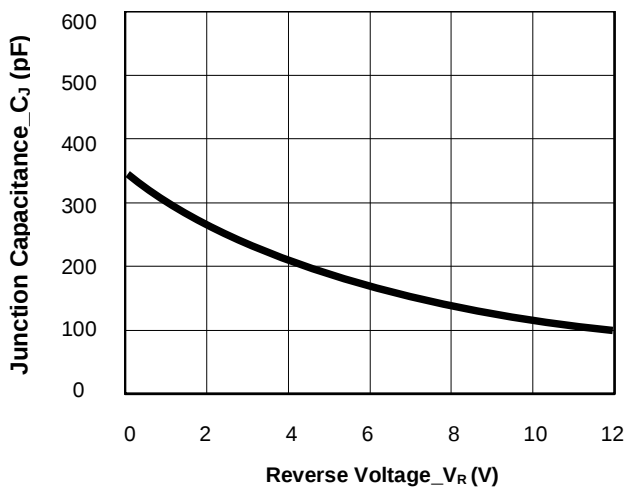
**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

| Parameter                                | Symbol    | Value       | Unit               |
|------------------------------------------|-----------|-------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | $P_{PK}$  | 3800        | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | $I_{PP}$  | 160         | A                  |
| ESD per IEC 61000-4-2 (Air)              | $V_{ESD}$ | $\pm 30$    | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |           | $\pm 30$    |                    |
| Operating Temperature Range              | $T_J$     | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range                | $T_{STG}$ | -55 to +150 | $^{\circ}\text{C}$ |

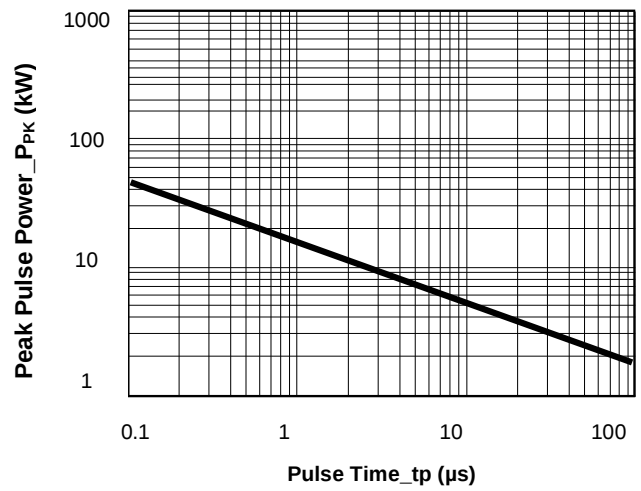
**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

| Parameter               | Symbol    | Min | Typ | Max | Unit          | Test Condition                                    |
|-------------------------|-----------|-----|-----|-----|---------------|---------------------------------------------------|
| Reverse Working Voltage | $V_{RWM}$ |     |     | 12  | V             |                                                   |
| Breakdown Voltage       | $V_{BR}$  | 13  |     |     | V             | $I_T = 1\text{mA}$                                |
| Reverse Leakage Current | $I_R$     |     |     | 1   | $\mu\text{A}$ | $V_{RWM} = 12\text{V}$                            |
| Clamping Voltage        | $V_C$     |     |     | 15  | V             | $I_{PP} = 5\text{A}$ (8/20 $\mu\text{s}$ pulse)   |
| Clamping Voltage        | $V_C$     |     |     | 24  | V             | $I_{PP} = 160\text{A}$ (8/20 $\mu\text{s}$ pulse) |
| Junction Capacitance    | $C_J$     |     |     | 320 | pF            | $V_R = 0\text{V}$ , $f = 1\text{MHz}$             |

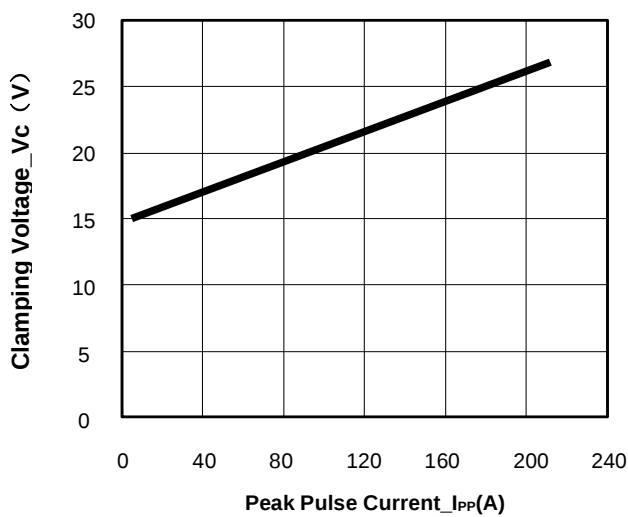
**Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)**



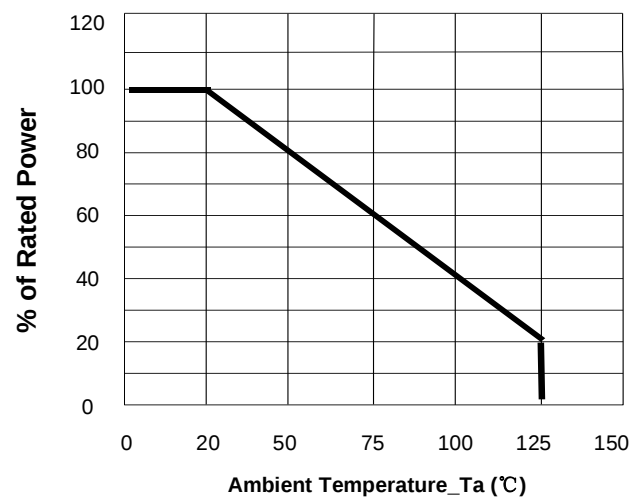
**Junction Capacitance vs. Reverse Voltage**



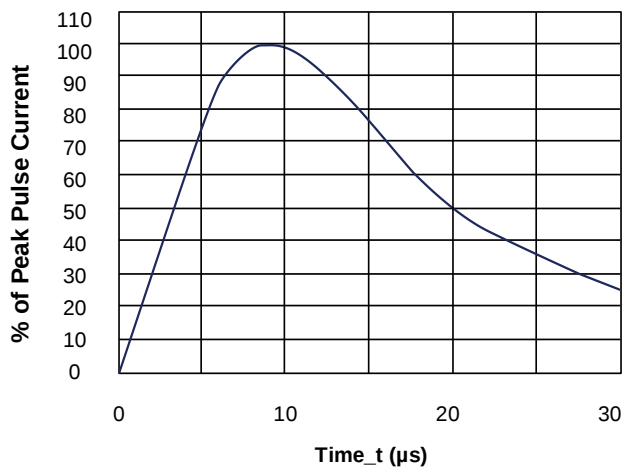
**Peak Pulse Power vs. Pulse Time**



**Clamping Voltage vs. Peak Pulse Current**

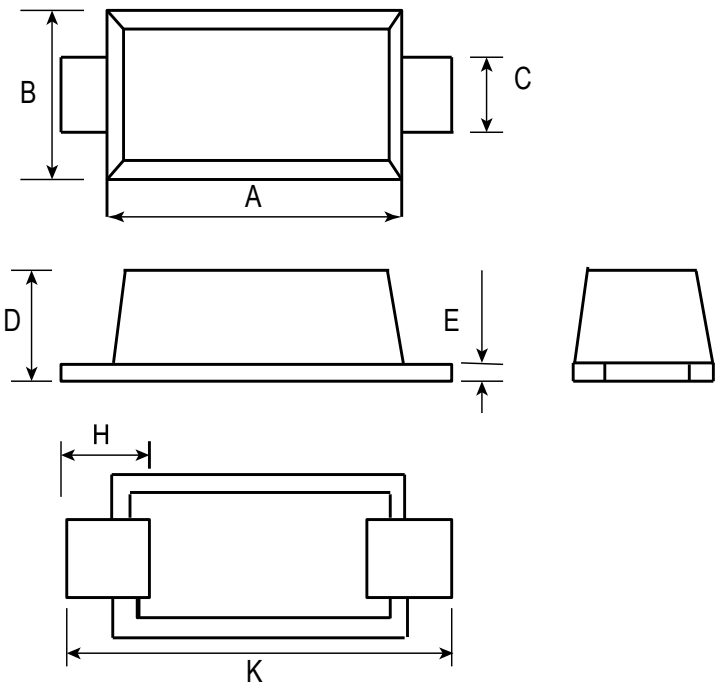


**Power Derating Curve**



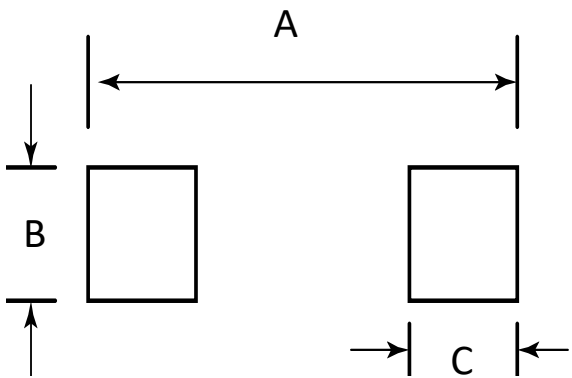
**8/20 $\mu\text{s}$  Pulse Waveform**

**SOD-123FL Package Outline Drawing**



| DIM | Millimeters |      |      |
|-----|-------------|------|------|
|     | Min         | Nom  | Max  |
| A   | 2.70        | 2.80 | 2.90 |
| B   | 1.80        | 1.90 | 2.00 |
| C   | 0.80        | 1.00 | 1.20 |
| D   |             |      | 1.40 |
| E   | 0.10        | 0.20 | 0.30 |
| H   | 0.35        |      | 0.85 |
| K   | 3.50        |      | 3.90 |

**Suggested Land Pattern**



| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| A   | 4.19        | 0.165  |
| B   | 1.20        | 0.048  |
| C   | 0.90        | 0.036  |