

**1-Line Bi-directional TVS Diode**

**Description**

The PESDR1861D3 is a 18V bi-direction TVS diode, 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 PESDR1861D3 has a low capacitance with a typical value at 1.0pF, and complies with the IEC 61000-4-2 (ESD) standard with ±30kV air and ±30kV contact discharged. It is assembled into a lead-free SOD-323 package. The small size, low capacitance and high ESD protection make PESDR1861D3 an ideal choice to protect cellphone, digital video interfaces and other high speed ports.

**Features**

- 480W Peak Pulse Power per Line (tp = 8/20µs)
- Ultra low capacitance: 1.0pF typical
- Ultra low leakage: nA level
- Low operating voltage: 18V
- Low clamping voltage
- Protects one power line or data line
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - IEC 61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 12A (8/20µs)
- RoHS Compliant

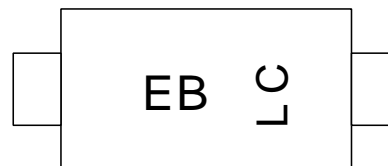
**Mechanical Characteristics**

- Package: SOD-323
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below

**Applications**

- Ethernet - 10/100/1000 Base T
- Cellular Phones
- Handheld - Wireless Systems
- Personal Digital Assistant (PDA)
- USB Interface

**Marking Information**

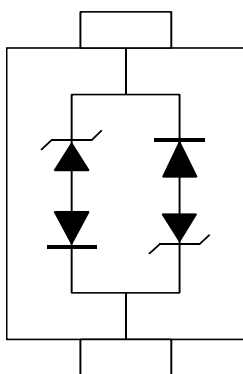


**EB** = Device Marking Code

**Ordering Information**

Part Number	Shipping	Reel Size
PESDR1861D3	3000/Tape & Reel	7 inch

**Dimensions and Pin Configuration**



Circuit and Pin Schematic

**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>	450	W
Peak Pulse Current (8/20μs)	I <sub>PP</sub>	12	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	kV
Operating Temperature Range	T <sub>OP</sub>	-55 to +125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

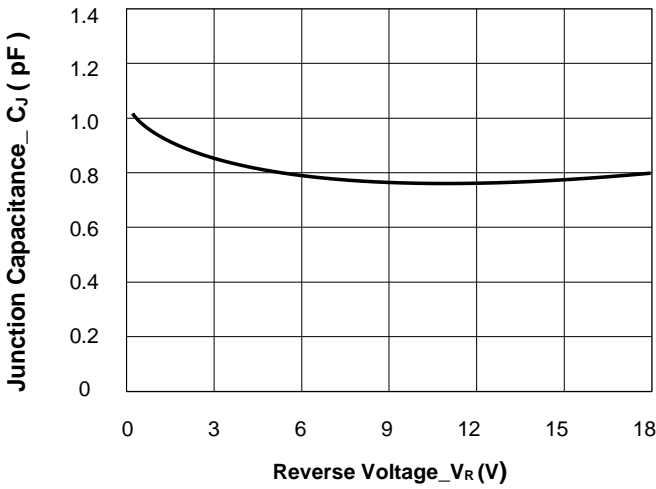
**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			18	V	
Breakdown Voltage	V <sub>BR</sub>	20			V	I <sub>T</sub> = 1mA
Reverse Leakage Current	I <sub>R</sub>			200	nA	V <sub>RWM</sub> = 18.0V
Clamping Voltage	V <sub>C</sub>		36	40	V	I <sub>PP</sub> = 12A (8/20μs pulse)
Dynamic Resistance <sup>1,2</sup>	R <sub>DYN</sub>		0.46		Ω	TLP=0.2/100ns
ESD Clamping Voltage <sup>1</sup>	V <sub>C</sub>		24.7		V	I <sub>PP</sub> = 4A, tp = 0.2/100ns
ESD Clamping Voltage <sup>1</sup>	V <sub>C</sub>		30.2		V	I <sub>PP</sub> = 16A, tp = 0.2/100ns
Junction Capacitance	C <sub>J</sub>		1.0	1.35	pF	V <sub>R</sub> = 0V, f = 1MHz

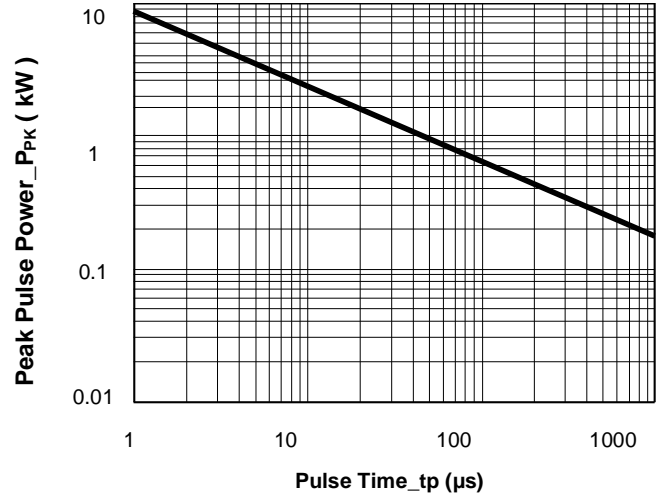
Notes: 1、 TLP Setting: tp=100ns, tr=0.2ns, I<sub>TLP</sub> and V<sub>TLP</sub> sample window: t1=70ns to t2=90ns.

2、 Dynamic resistance calculated from I<sub>PP</sub>=4A to I<sub>PP</sub>=16A using "Best Fit".

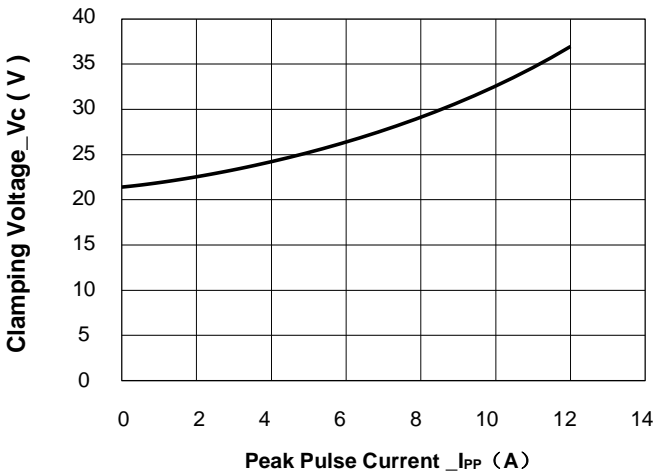
**Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)**



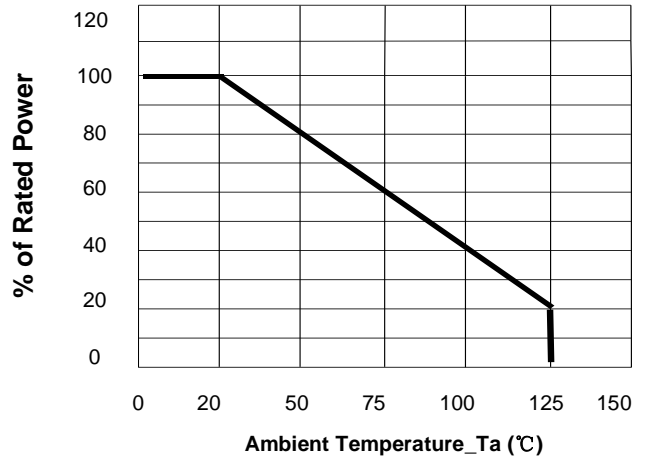
**Junction Capacitance vs. Reverse Voltage**



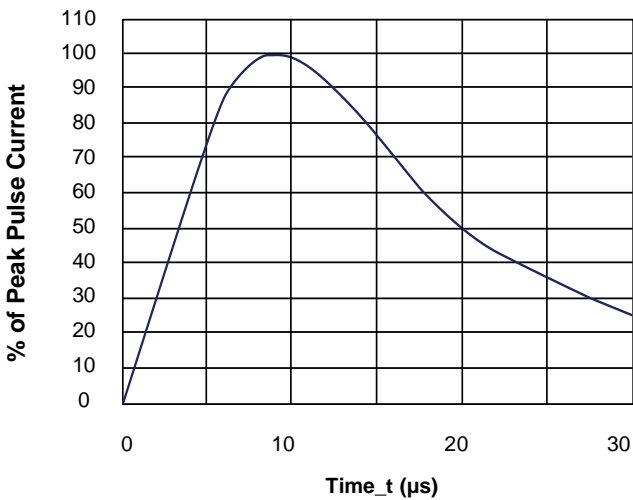
**Peak Pulse Power vs. Pulse Time**



**Clamping Voltage vs. Peak Pulse Current**

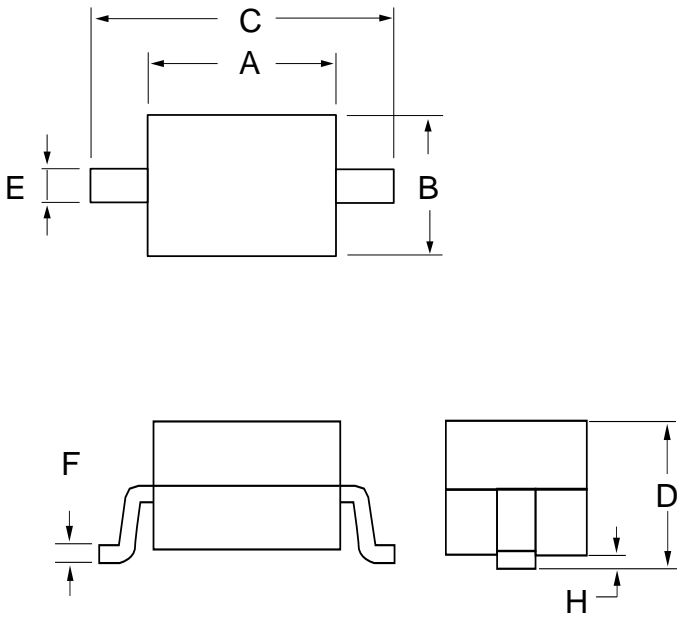


**Power Derating Curve**



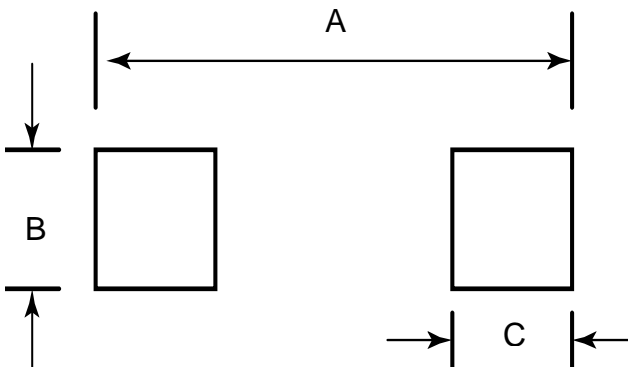
**8/20μs Pulse Waveform**

**SOD-323 Package Outline Drawing**



SYM	DIMENSIONS				
	MILLIMETERS			INCHES	
	MIN	NOM	MAX	MIN	MAX
A	1.50	1.65	1.80	0.060	0.071
B	1.20	1.30	1.40	0.045	0.054
C	2.30	2.50	2.70	0.090	0.107
D	-	-	1.10	-	0.043
E	0.30	-	0.40	0.012	0.016
F	0.10	-	0.25	0.004	0.010
H	-	-	0.10	-	0.004

**Suggested Land Pattern**



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031