1-Line Ultra Low Capacitance Bi-directional TVS Diode

Description

PESDR0541P1A is an ultra-low capacitance TVS (Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).

PESDR0541P1A may be used to provide ESD protection up to ±30KV (air and contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 7A (8/ 20μs) according to IEC61000-4-5.

Features

- Ultra small package: 1.0x0.6x0.5mm
- Ultra low capacitance: 0.7pF typical
- Operating voltage: 5V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - IEC61000-4-5 (Lightning)7A (8/20μs)
- RoHS Compliant

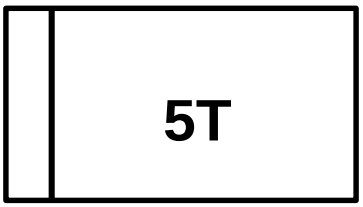
Mechanical Characteristics

- Package: DFN1006-2 (1.0×0.6×0.5mm)
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Marking Information: See Below

Applications

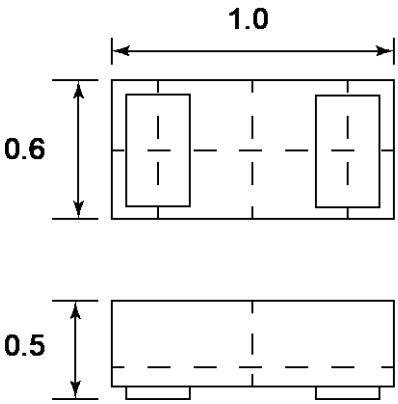
- 10/100/1000 Ethernet
- STB
- Router
- Networking
- Modem

Marking Information

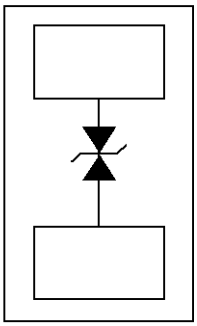


5T = Device Marking Code

Dimensions and Pin Configuration



Package Dimensions



Circuit and Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
PESDR0541P1A	10000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P_{PK}	77	W
Peak Pulse Current (8/20μs)	I_{PP}	7	A
ESD per IEC 61000−4−2 (Air)	V_{ESD}	±30	kV
ESD per IEC 61000−4−2 (Contact)		±30	
Lead temperature	T_L	260	℃
Operating Temperature Range	T_{OP}	−40 ~ +85	℃
Storage Temperature Range	T_{STG}	−55 ~ +150	℃

Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6.0	8.0		V	I_T = 1mA
Reverse Leakage Current	I_R			50	nA	V_{RWM} =5V
Clamping voltage[1)]	V_{CL}		13		V	I_{PP} = 16A, t_p = 100ns
Dynamic resistance[1)]	R_{DYN}		0.4		Ω	
Clamping voltage[2)]	V_{CL}		13		V	V_{ESD} = 8kV
Clamping Voltage[3)]	V_C			9	V	I_{PP} = 1A (8/20μs pulse)
Clamping Voltage[3)]	V_C			11	V	I_{PP} = 7A (8/20μs pulse)
Junction Capacitance	C_J		0.7		pF	V_R = 0V, f = 1MHz

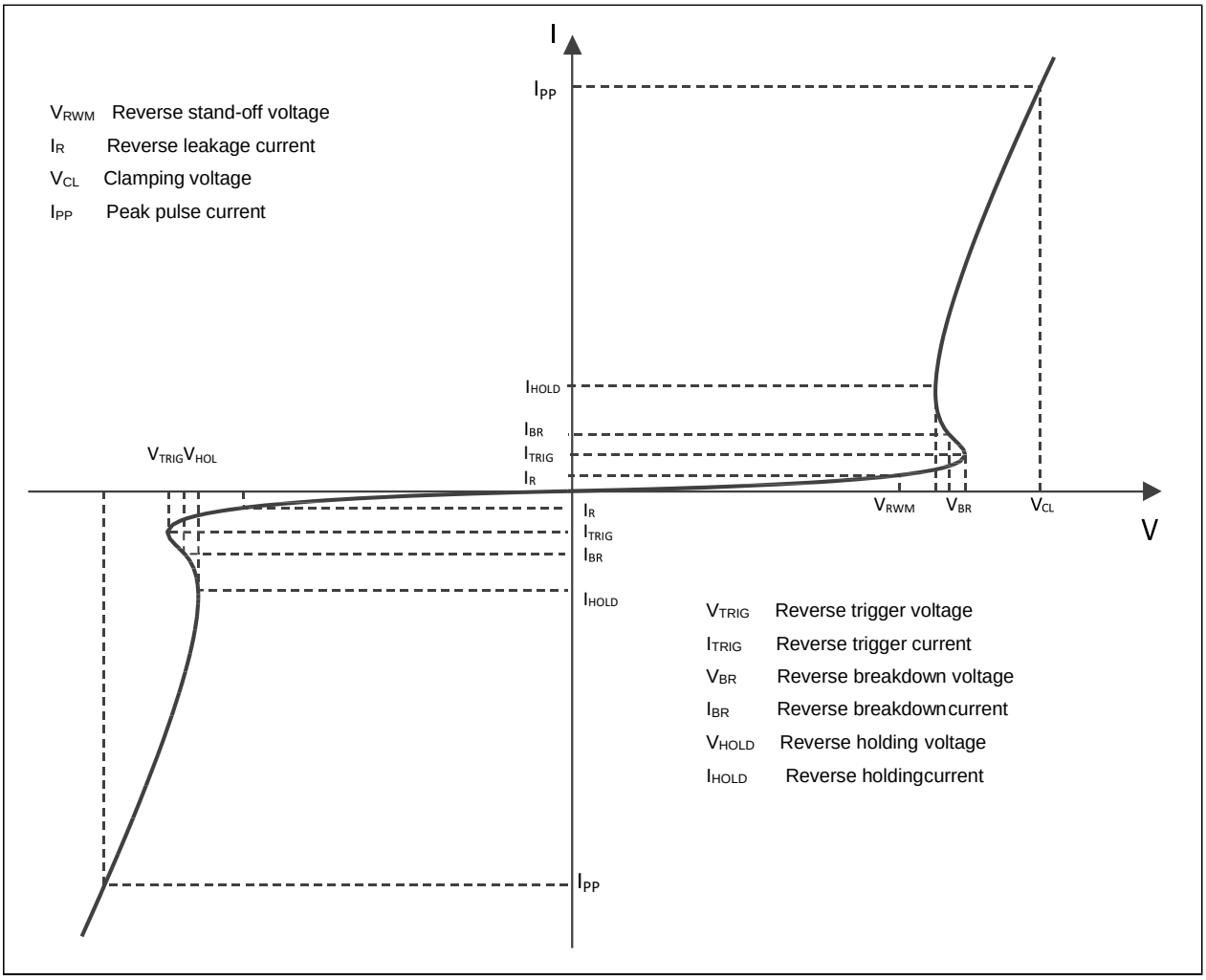
Notes:

1) TLP parameter: Z_0 = 50Ω, tp = 100ns, tr = 2ns, averaging window from 60ns to 80ns. RDYN is calculated from 4A to 16A.

2) Contact discharge mode, according to IEC61000-4-2.

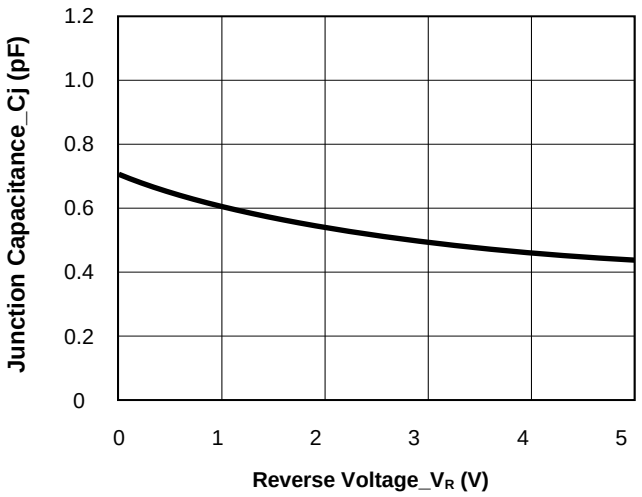
3) Non-repetitive current pulse, according to IEC61000-4-5.

Electrical characteristics (T_A = 25℃, unless otherwise noted)

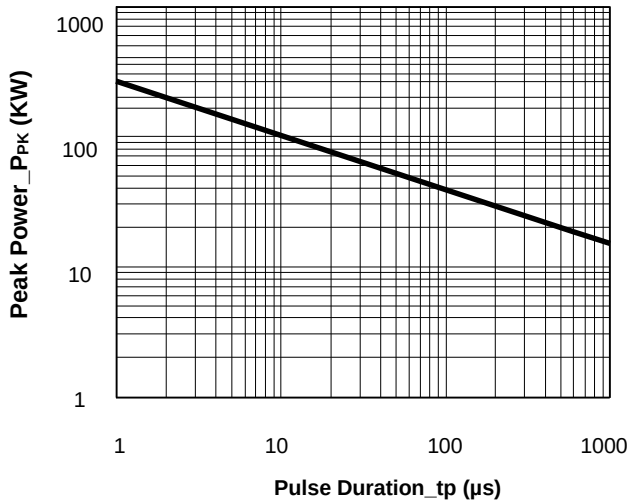


Definitions of electrical characteristics

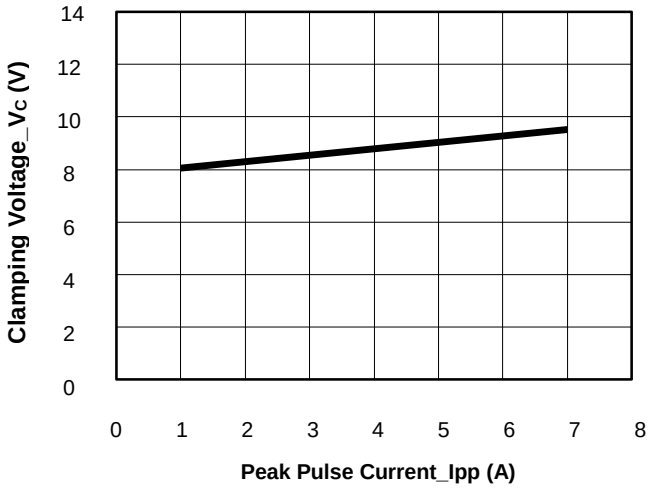
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



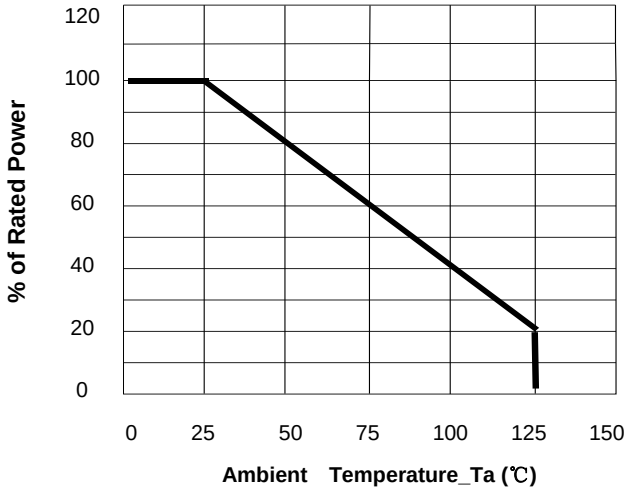
Junction Capacitance vs. Reverse Voltage



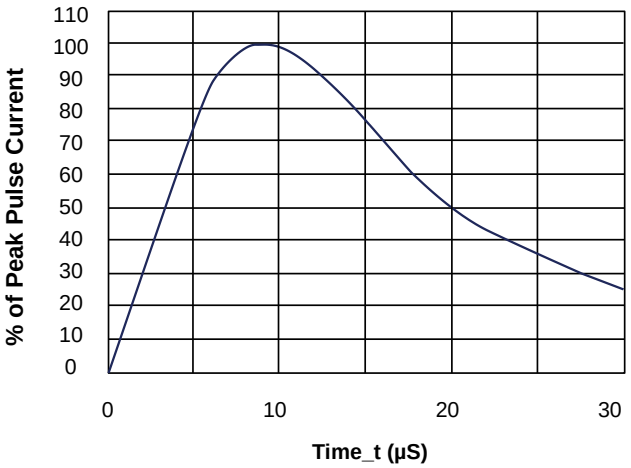
Peak Pulse Power vs. Pulse Time



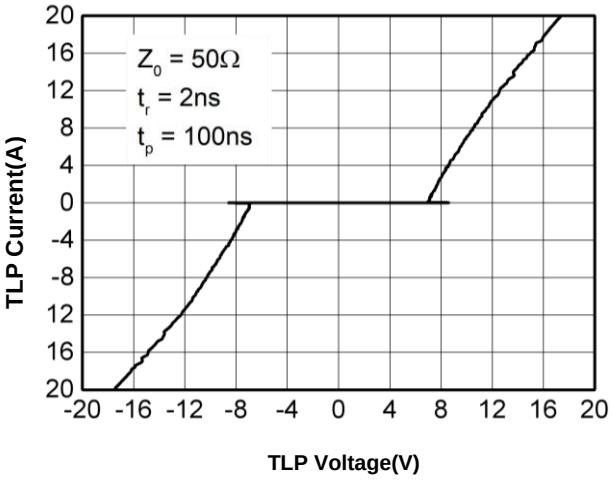
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve

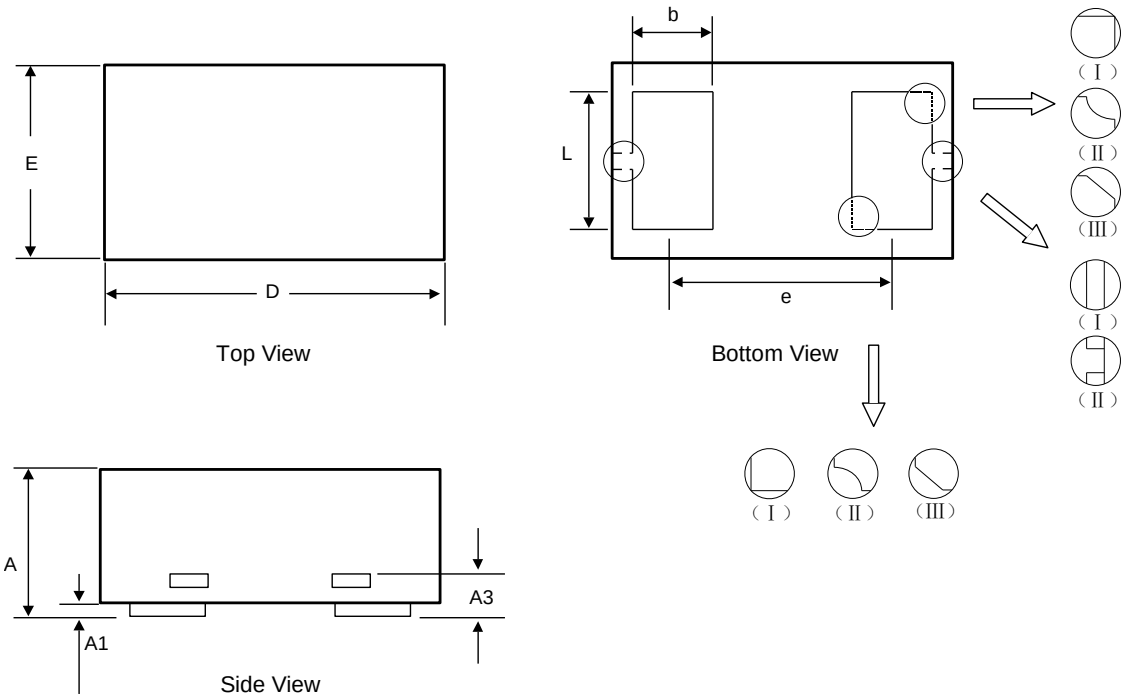


8/20μS Pulse Waveform



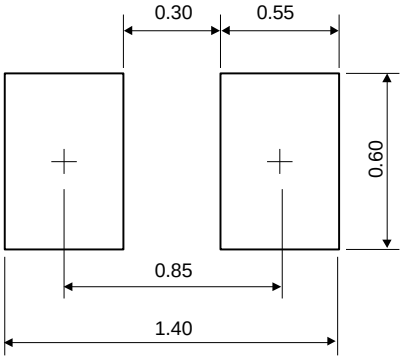
TLP Measurement

DFN1006-2 Package Outline Drawing



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.340	0.450	0.550
A1	0.000	0.020	0.050
A3		0.125 Ref.	
D	0.950	1.000	1.075
E	0.490	0.600	0.675
b	0.200	0.250	0.300
L	0.450	0.500	0.550
e		0.650 BSC	

Recommended PCB Layout (Unit: mm)

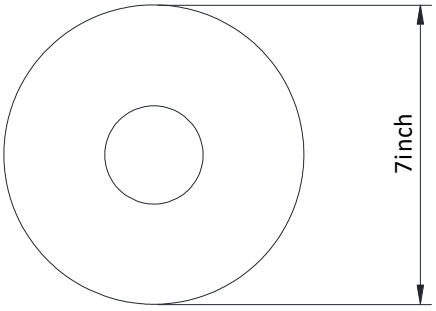


Notes:

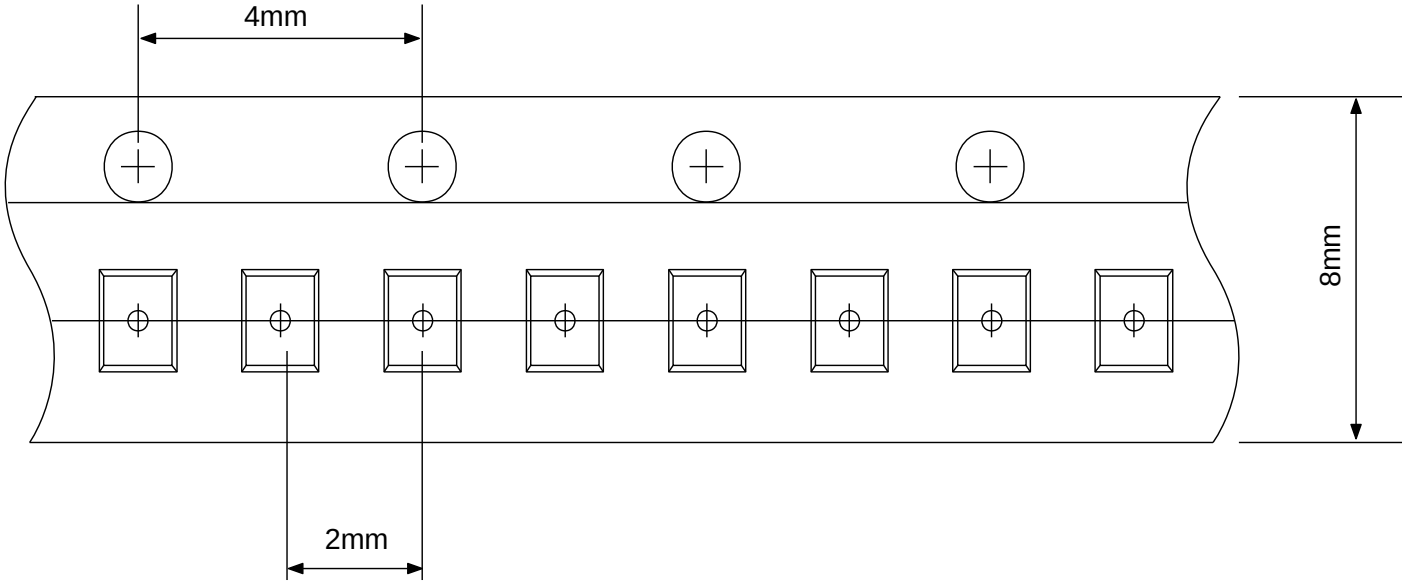
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

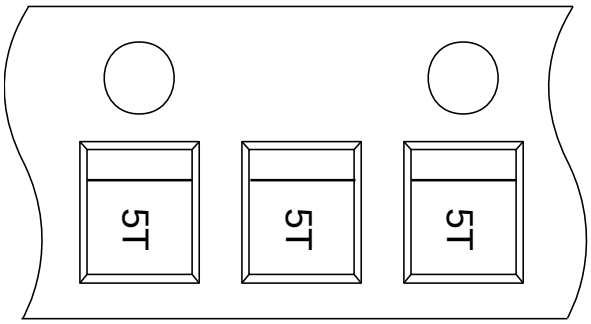
TAPE AND REEL INFORMATION

Reel Dimensions



Tape Dimensions





User Direction of Feed

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