

**1-Line, Bi-directional, Ultra-low Capacitance
Transient Voltage Suppressor**

Features

- ◆ Stand-off voltage: 5V Max.
- ◆ Transient protection for each line according to IEC61000-4-2(ESD): ±30kV (contact)
IEC61000-4-5(surge): 7A (8/20µs)
- ◆ Ultra-low capacitance: $C_J = 0.8\text{pF}$ typ.
- ◆ Ultra-low leakage current: $I_R < 1\text{nA}$ typ.
- ◆ Low clamping voltage: $V_{CL} = 13.0\text{V}$ typ. @ $I_{PP} = 16\text{A}$ (TLP)
- ◆ Solid-state silicon technology

Applications

- ◆ USB 2.0 and USB 3.0
- ◆ HDMI 1.3, HDMI 1.4 and HDMI 2.0
- ◆ SATA and eSATA interface
- ◆ DVI
- ◆ IEEE 1394
- ◆ Portable Electronics and Notebooks

Descriptions

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).

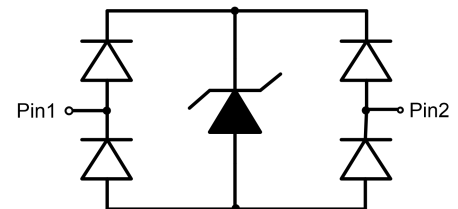
PESDR0541P1A incorporates one pair of ultra-low capacitance steering diodes plus a TVS diode.

PESDR0541P1A may be used to provide ESD protection up to ±15KV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 7A (8/20µs) according to IEC61000-4-5.

PESDR0541P1A is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.



DFN1006-2 (Bottom View)



Pin configuration



5T= Device code

Marking (Top View)

Order information

Device	Package	Shipping
PESDR0541P1A	DFN1006-2	10000/Tape & Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	P_{pk}	77	W
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	7	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 15	kV
ESD according to IEC61000-4-2 contact discharge		± 15	
Junction temperature	T_J	125	$^{\circ}C$
Operating temperature	T_{OP}	-40~85	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

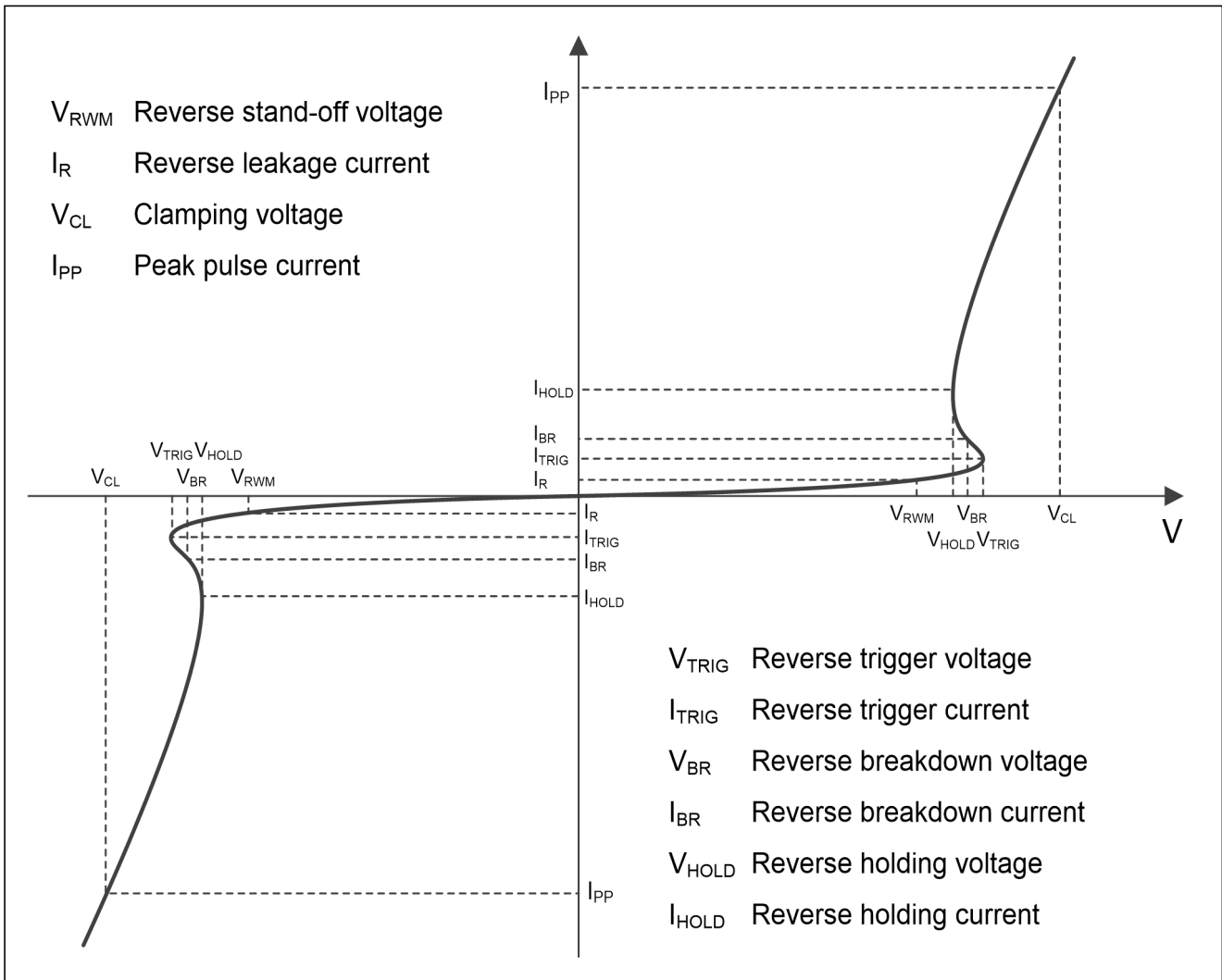
Electrical characteristics ($T_A = 25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	$V_{RWM} = 5V$		<1	50	nA
Reverse breakdown voltage	V_{BR}	$I_{BR} = 1mA$	6.0	8.0		V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16A, t_p = 100ns$		13		V
Dynamic resistance ¹⁾	R_{DYN}			0.55		Ω
Clamping voltage ²⁾	V_{CL}	$V_{ESD} = 8kV$		13		V
Clamping voltage ³⁾	V_{CL}	$I_{PP} = 1A, t_p = 8/20\mu s$		8.1	9	V
		$I_{PP} = 7A, t_p = 8/20\mu s$		9.7	11	V
Junction capacitance	C_J	$V_R = 0V, f = 1MHz$		0.8	1.0	pF

Notes:

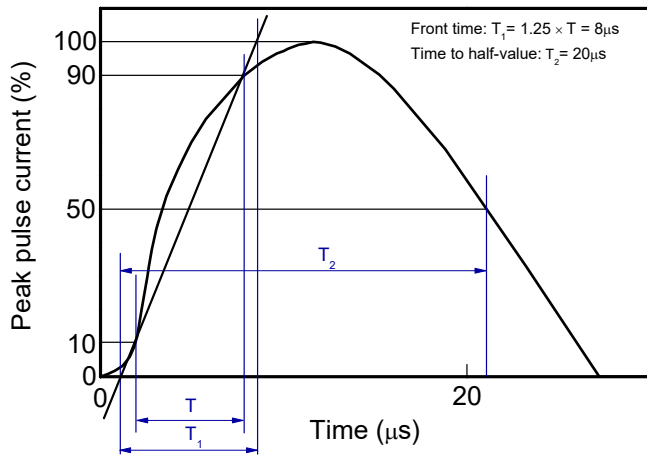
- 1) TLP parameter: $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

Electrical characteristics (T_A=25 °C, unless otherwise noted)

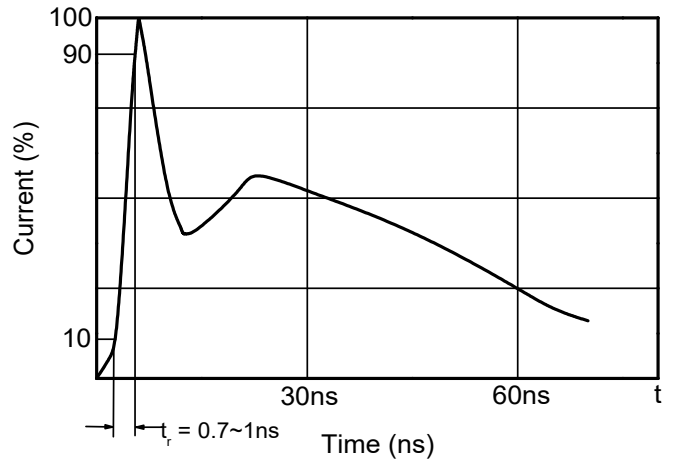


Definitions of electrical characteristics

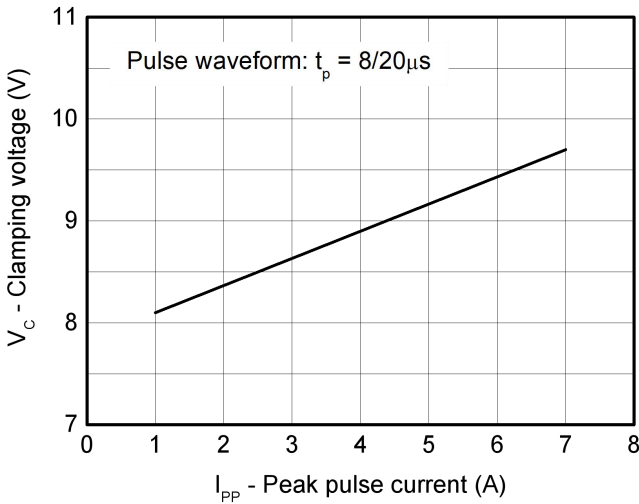
Typical characteristics (TA = 25 °C, unless otherwise noted)



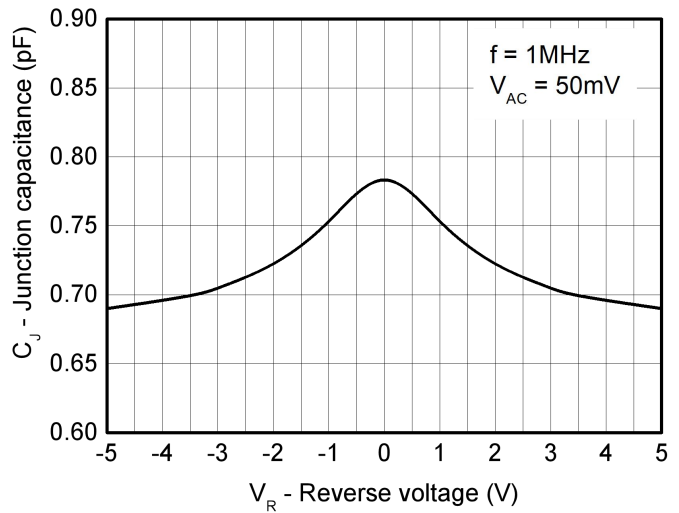
8/20μs waveform per IEC61000-4-5



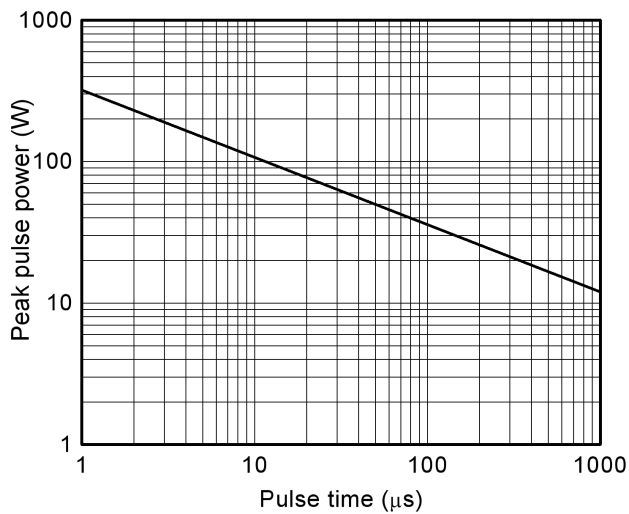
Contact discharge current waveform per IEC61000-4-2



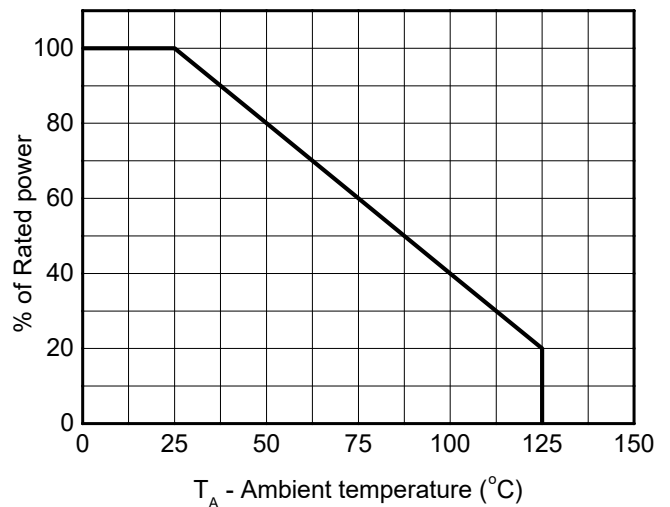
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

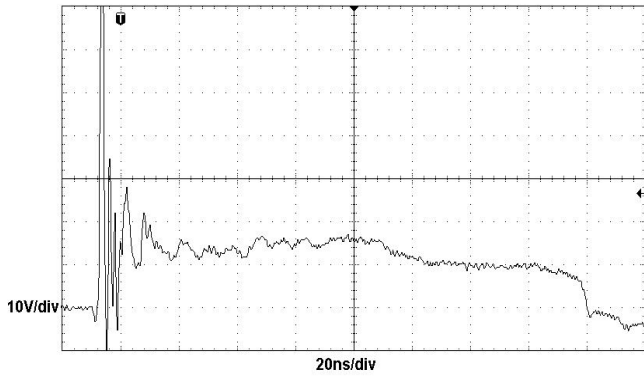


Non-repetitive peak pulse power vs. Pulse time



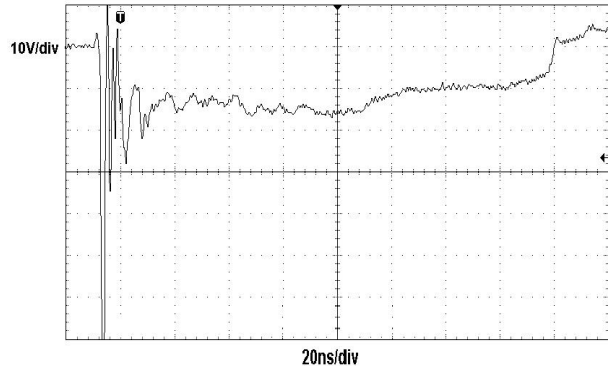
Power derating vs. Ambient temperature

Typical characteristics (TA = 25 °C, unless otherwise noted)



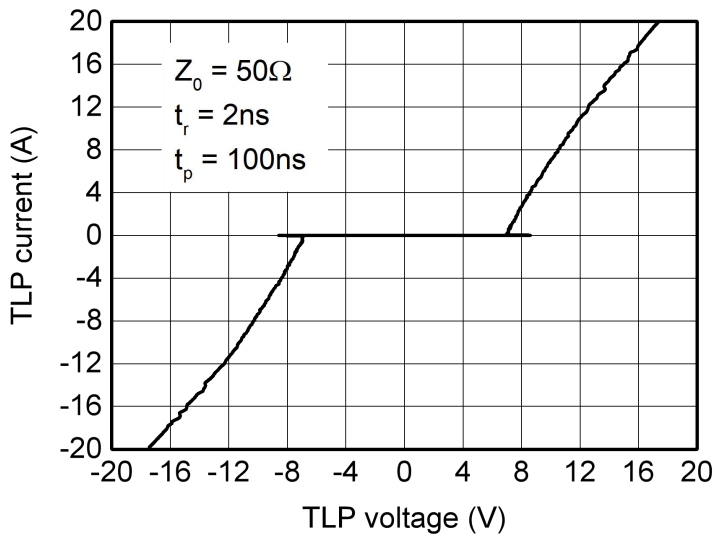
ESD clamping

(+8kV contact discharge per IEC61000-4-2)



ESD clamping

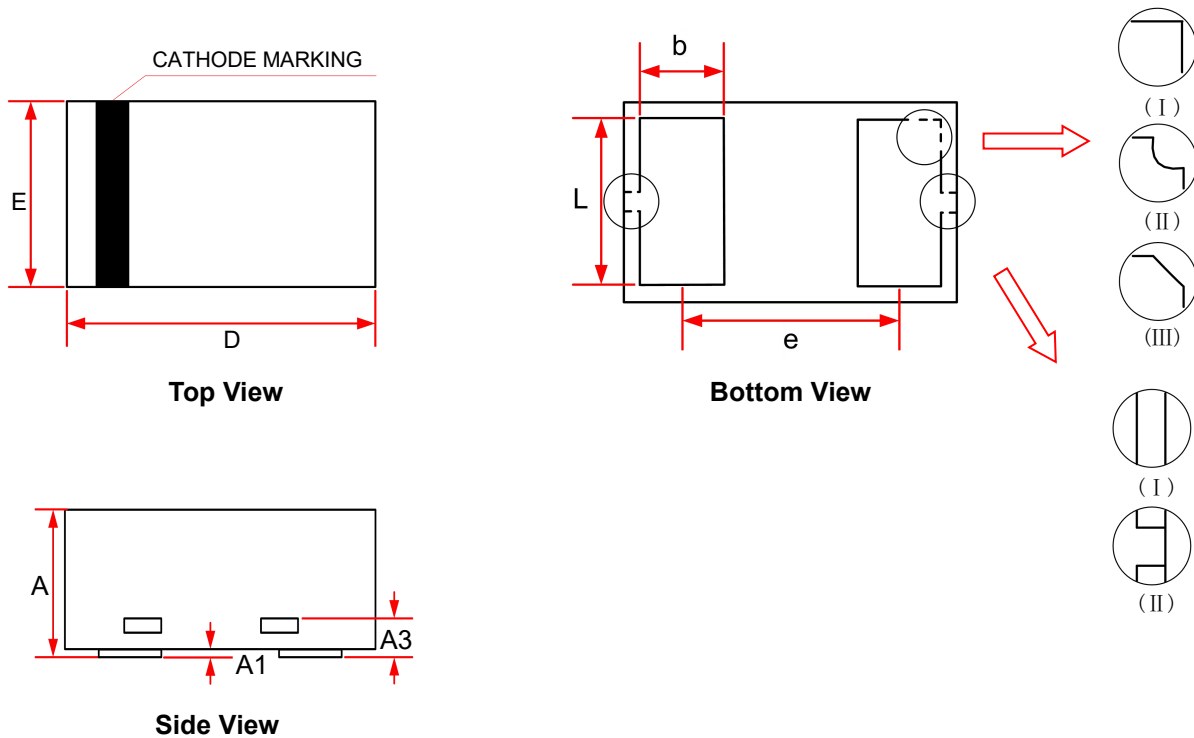
(-8kV contact discharge per IEC61000-4-2)



TLP Measurement

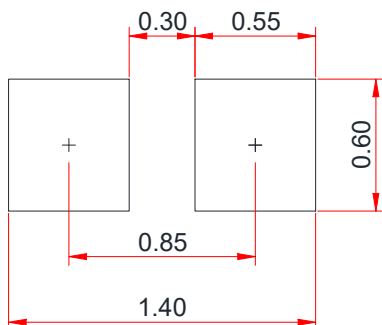
PACKAGE OUTLINE DIMENSIONS

DFN1006-2



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.340	0.450	0.530
A1	0.000	0.020	0.050
A3	0.125 Ref.		
D	0.950	1.000	1.075
E	0.550	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.