

**1-Line, Bi-directional, Transient Voltage Suppressor**

**Features**

- Stand-off voltage:  $\pm 5V$  Max.
- Transient protection for each line according to  
IEC61000-4-2(ESD):  $\pm 30kV$  (contact)  
IEC61000-4-4 (EFT): 40A (5/50ns)  
IEC61000-4-5(surge): 15A (8/20 $\mu s$ )
- Ultra-low capacitance:  $C_J = 1.35pF$  typ.
- Low leakage current:  $I_R < 1nA$  typ.
- Low clamping voltage:  $V_{CL} = 12.0V$  typ. @  $I_{PP} = 16A$  (TLP)
- Solid-state silicon technology

**Applications**

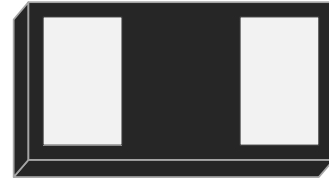
- 10/100/1000 Ethernet
- STB
- Router
- Networking
- Modem

**Descriptions**

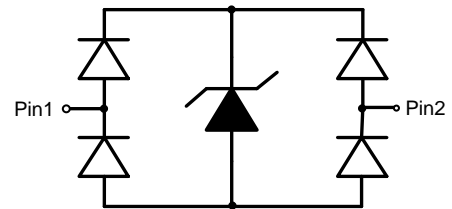
PESDR0561P1A is a bi-directional TVS (Transient Voltage Suppressor). It has been specifically designed to protect sensitive electronic components which are connected to low speed data lines and control lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

PESDR0561P1A may be used to provide ESD protection up to  $\pm 30KV$  (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 15A (8/20 $\mu s$ ) according to IEC61000-4-5.

PESDR0561P1A is available in DFN1006-2package. Standard products are Pb-free and Halogen-free.



**DFN1006-2 (Bottom View)**



**Pin configuration**



**5S**= Device code

**Marking (Top View)**

**Order information**

Device	Package	Shipping
PESDR0561P1A	DFN1006-2	10000/Tape & Reel

**Absolute maximum ratings**

Parameter	Symbol	Rating	Unit
Peak pulse power ( $t_p = 8/20\mu s$ )	$P_{pk}$	210	W
Peak pulse current ( $t_p = 8/20\mu s$ )	$I_{PP}$	15	A
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
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	$^{\circ}C$

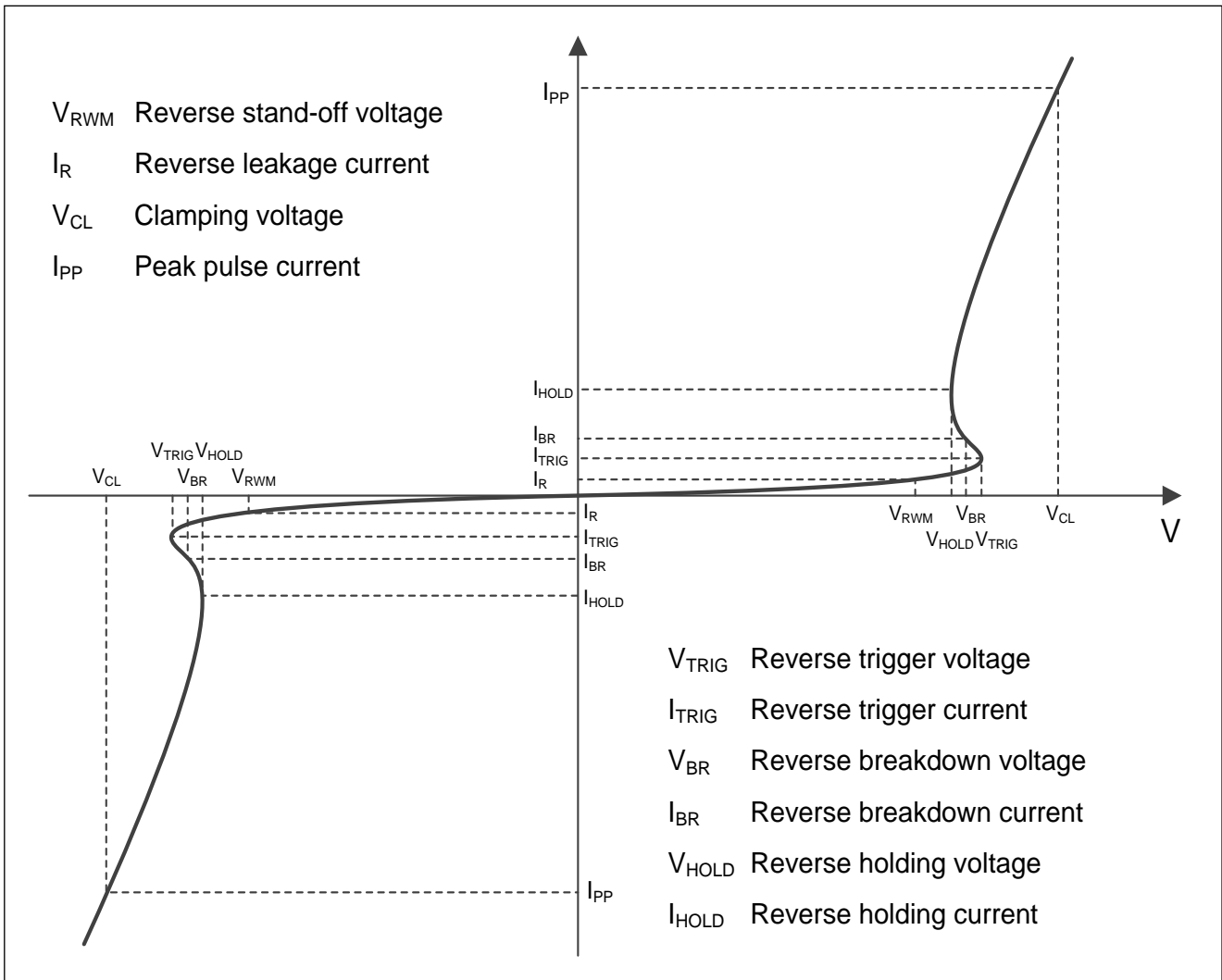
**Electrical characteristics ( $T_A = 25^{\circ}C$ , unless otherwise noted)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	$V_{RWM}$				$\pm 5$	V
Reverse leakage current	$I_R$	$V_{RWM} = 5V$		<1	50	nA
Reverse breakdown voltage	$V_{BR}$	$I_{BR} = 1mA$	6	8		V
Reverse holding voltage	$V_{HOLD}$	$I_{HOLD} = 500mA$	5	7		V
Clamping voltage <sup>1)</sup>	$V_{CL}$	$I_{PP} = 16A, t_p = 100ns$		12		V
Dynamic resistance <sup>1)</sup>	$R_{DYN}$			0.3		$\Omega$
Clamping voltage <sup>2)</sup>	$V_{CL}$	$V_{ESD} = 8kV$		12		V
Clamping voltage <sup>3)</sup>	$V_{CL}$	$I_{PP} = 1A, t_p = 8/20\mu s$		8	10	V
		$I_{PP} = 15A, t_p = 8/20\mu s$		12	14	V
Junction capacitance	$C_J$	$V_R = 0V, f = 1MHz$		1.35	1.55	pF

Notes:

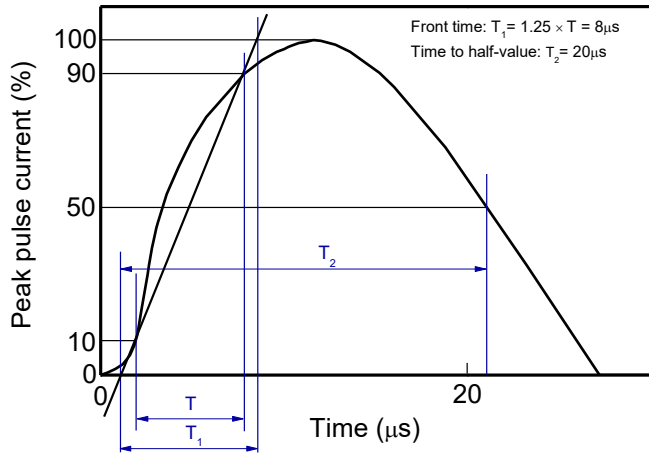
- 1) TLP parameter:  $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns$ , averaging window from 60ns to 80ns.  $R_{DYN}$  is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

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

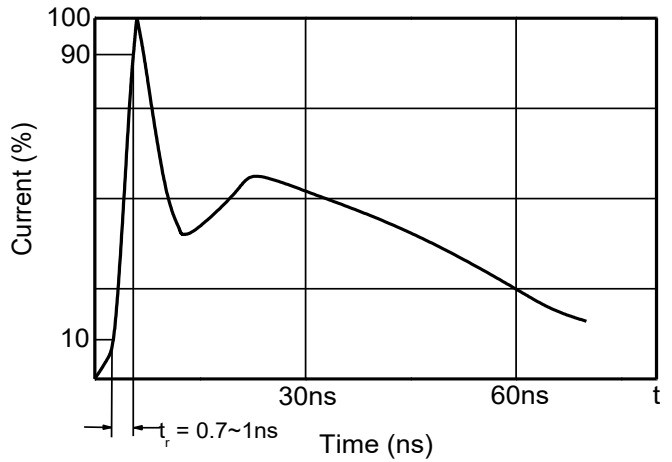


**Definitions of electrical characteristics**

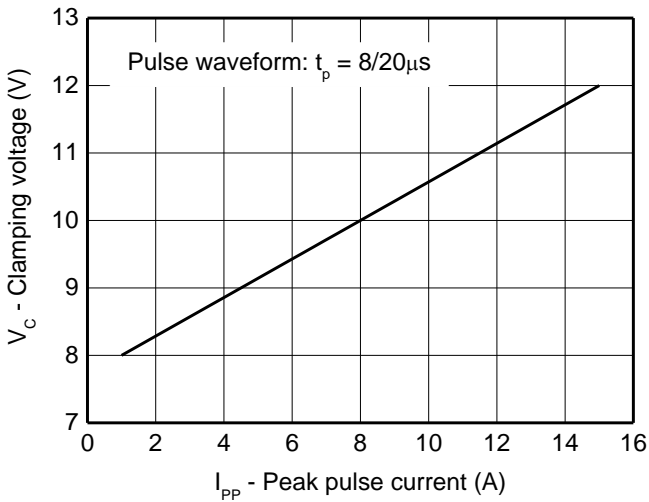
**Typical characteristics (TA = 25 °C, unless otherwise noted)**



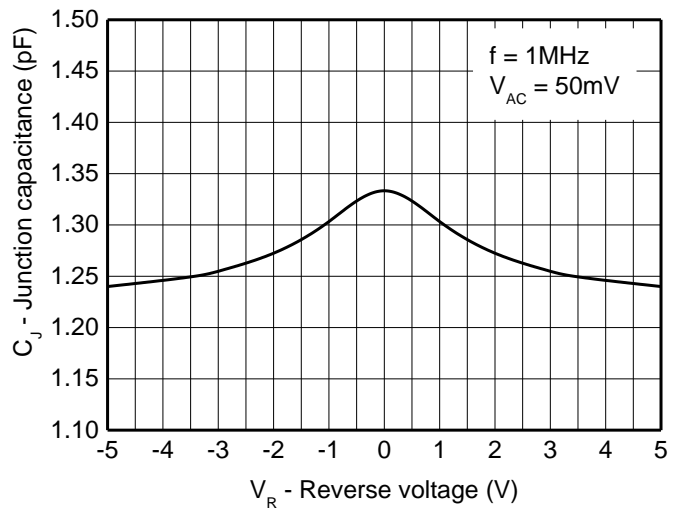
**8/20μs waveform per IEC61000-4-5**



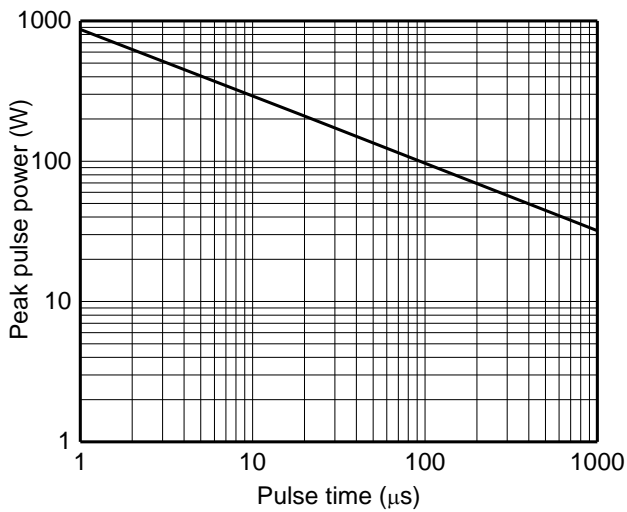
**Contact discharge current waveform per IEC61000-4-2**



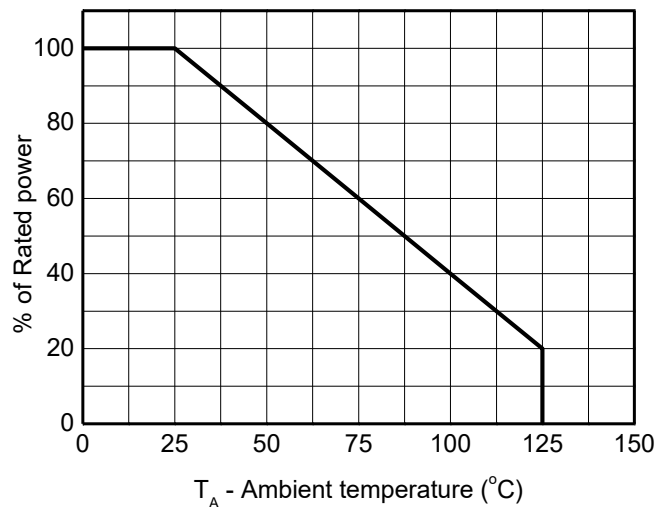
**Clamping voltage vs. Peak pulse current**



**Capacitance vs. Reverse voltage**

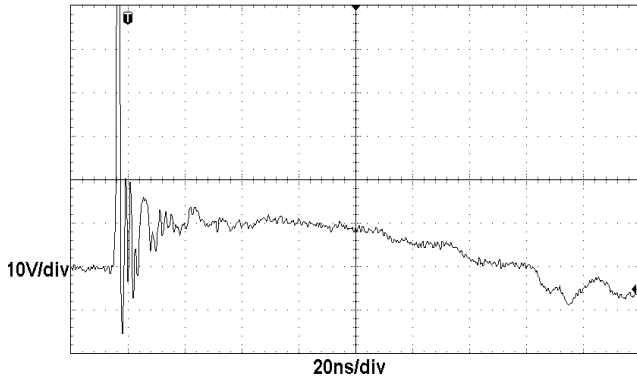


**Non-repetitive peak pulse power vs. Pulse time**

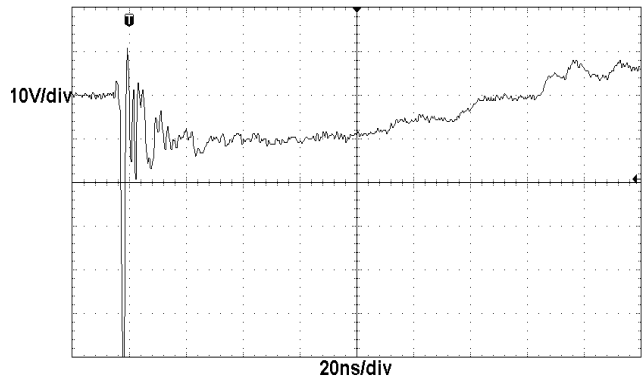


**Power derating vs. Ambient temperature**

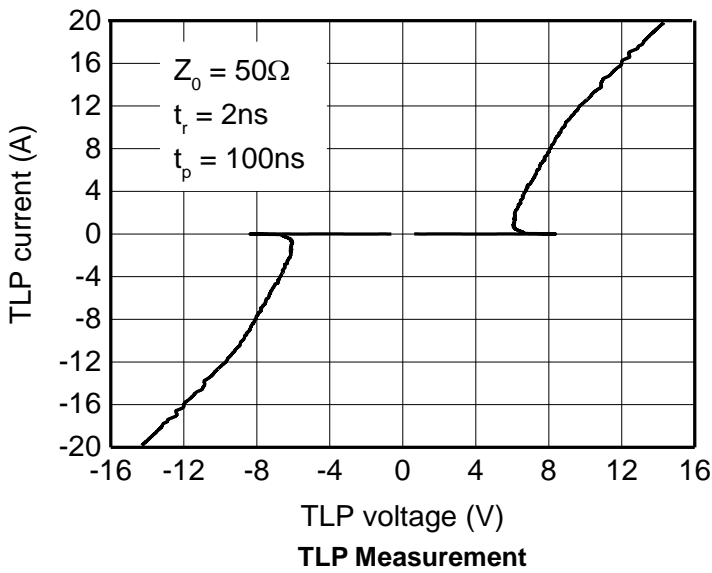
**Typical characteristics (TA = 25 °C, unless otherwise noted)**



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

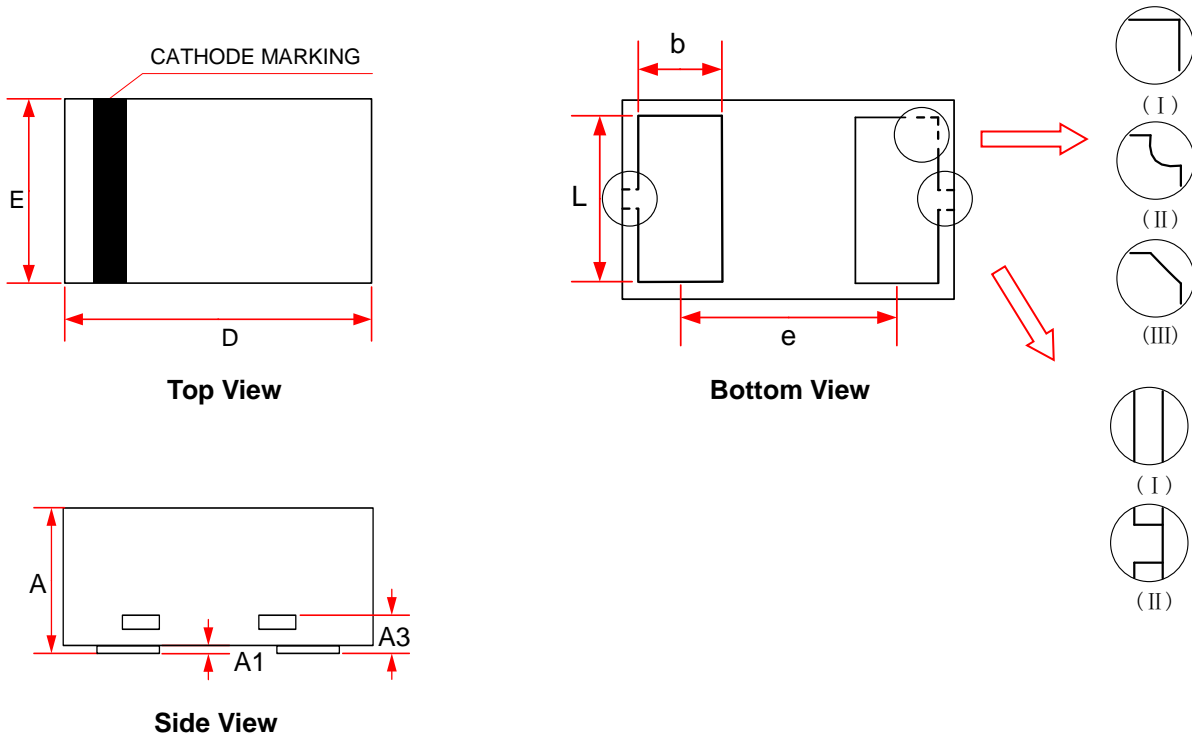


**ESD clamping**  
(-8kV contact discharge per IEC61000-4-2)



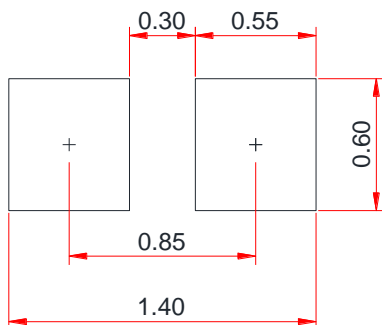
**PACKAGE OUTLINE DIMENSIONS**

**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.