

### Features

- ◆ Transient protection for data lines to **IEC 61000-4-2 (ESD) ±15kV (air), ±12kV (contact)**  
**IEC 61000-4-4 (EFT) 40A (tp = 5/50ns)**  
**Cable Discharge Event (CDE)**
- ◆ Ultra-small package (1.0 x 0.6 x 0.5mm)
- ◆ Protects one data or I/O line
- ◆ Low capacitance: **0.5pF(max)**
- ◆ Low clamping voltage
- ◆ Low operating voltage: 12V
- ◆ Solid-state silicon-avalanche technology

### Mechanical Characteristics

- ◆ Package: DFN1006-2
- ◆ Lead Finish: Matte Tin
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Pb-Free, Halogen Free, RoHS/WEEE Compliant



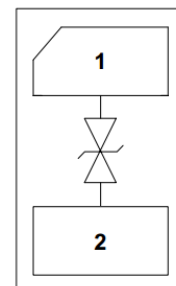
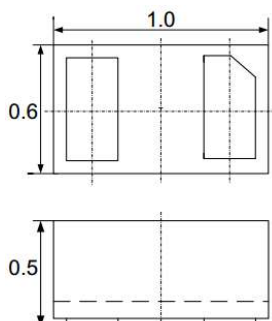
### Applications

- ◆ Cellular Handsets & Accessories
- ◆ Digital Visual Interface (DVI)
- ◆ Display Port
- ◆ MDDI Ports
- ◆ USB Ports
- ◆ PCI Express
- ◆ Serial ATA

### Ordering Information

Part Number	Qty per Reel	Reel Size
TPESD1221P	3000 Or 10000	7"

### Circuit Diagram and Pin Configuration



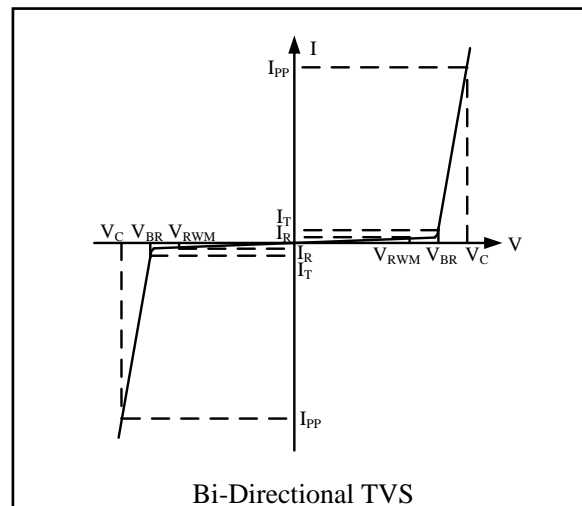
**Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

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Parameter	Symbol	Limits	unit
IEC61000-4-2(ESD) Contact Air	$V_{ESD}$	$\pm 15$ $\pm 12$	KV
Operating Temperature	$T_{OPT}$	-55/+125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55/+150	$^\circ\text{C}$

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

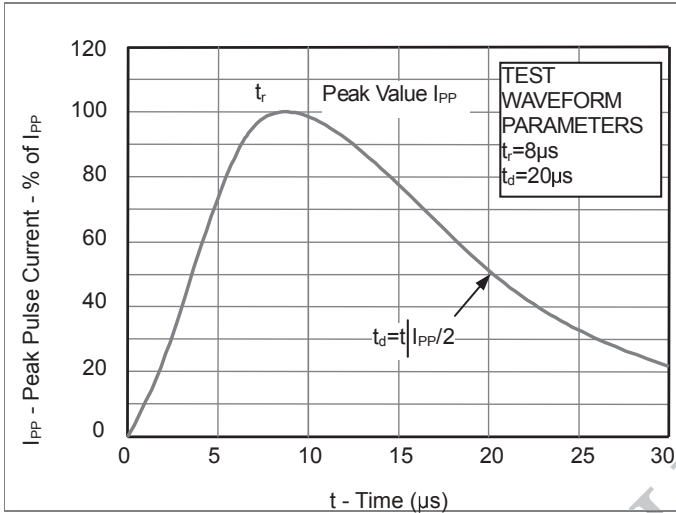
Symbol	Parameter
$V_{RWM}$	Nominal Reverse Working Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Reverse Breakdown Voltage @ $I_T$
$I_T$	Test Current for Reverse Breakdown
$V_C$	Clamping Voltage @ $I_{PP}$
$I_{PP}$	Maximum Peak Pulse Current
$C_{ESD}$	Parasitic Capacitance
$V_R$	Reverse Voltage
f	Small Signal Frequency



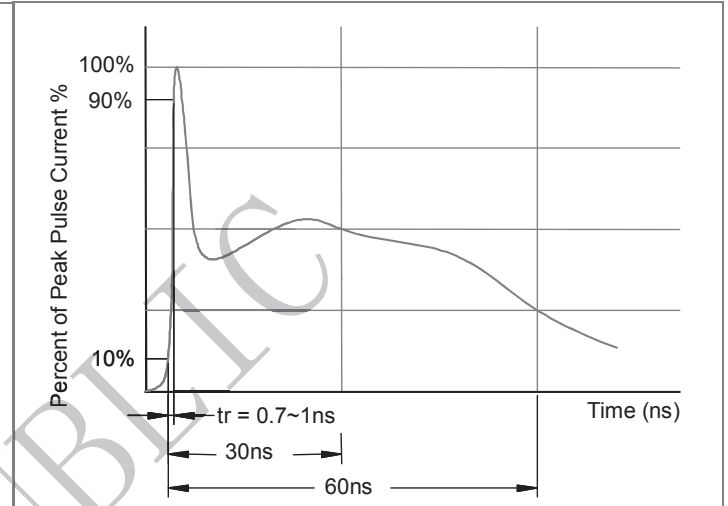
Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				12.0	V
$I_R$	$V_{RWM} = 12\text{V}$ , $T = 25^\circ\text{C}$ Between I/O and I/O		0.01	1.0	$\mu\text{A}$
$V_{BR}$	$I_T = 1\text{mA}$ Between I/O and I/O	14	16	18	V
$V_C$	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$ Between I/O and I/O		18	20	V
$C_{ESD}$	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ Between I/O and I/O		0.35	0.50	pF

**PROTECTION PRODUCTS**  
Typical characteristics

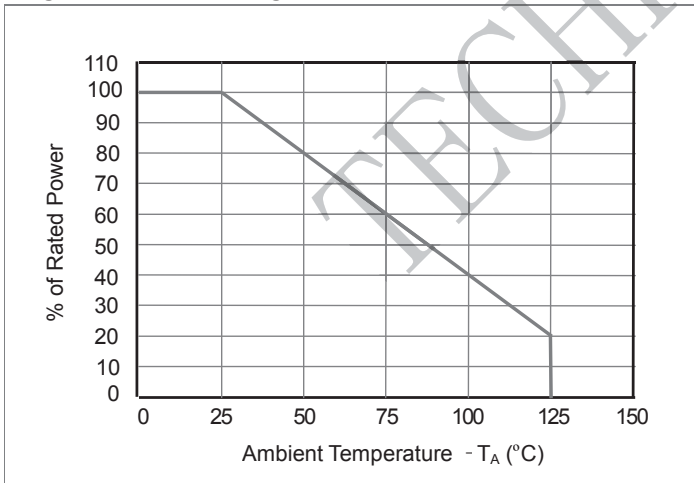
**Fig1. 8/20 $\mu$ s Pulse Waveform**



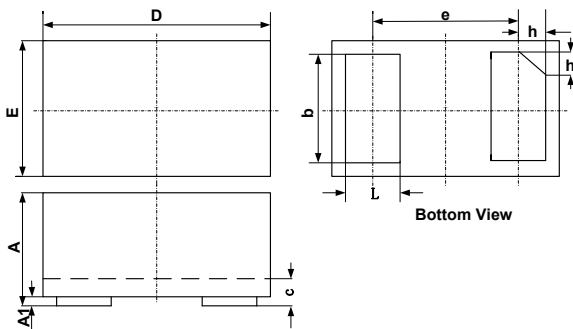
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



**Fig3. Power Derating Curve**

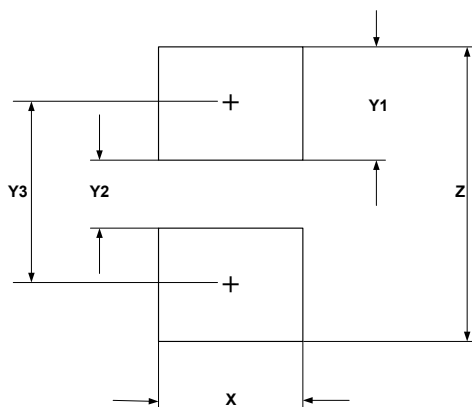


**Outline Drawing - DFN1006-2**



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
h	0.07	0.12	0.17	0.003	0.005	0.007

**Land Pattern - DFN1006-2**



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052