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TPESD1221P Ultra-Low Capacitance 1-Line ESD Protection

Features

- ◆ Transient protection for data lines to
IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 12\text{kV}$ (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



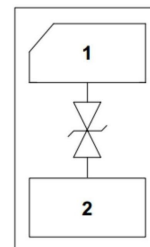
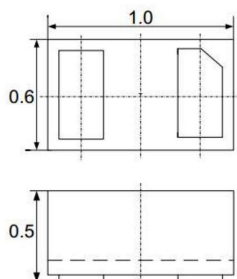
Applications

- ◆ 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



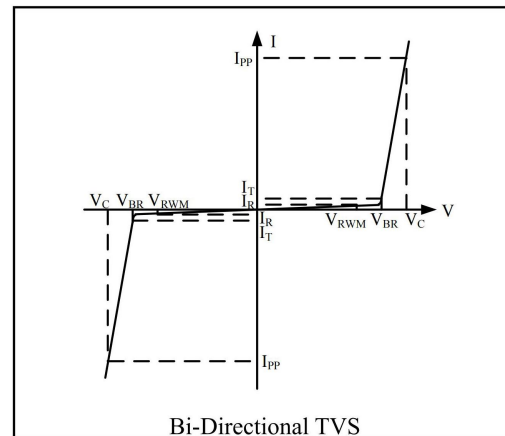
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Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Limits	unit
IEC61000-4-2(ESD) Contact Air	V_{ESD}	± 15 ± 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}	$V_{\text{RWM}} = 12\text{V}$, $T = 25^\circ\text{C}$ Between I/O and I/O		0.01	1.0	μA
V_{BR}	$I_{\text{T}} = 1\text{mA}$ Between I/O and I/O	14	16	18	V
V_{C}	$I_{\text{PP}} = 1\text{A}$, $t_p = 8/20\mu\text{s}$ Between I/O and I/O		18	20	V
C_{ESD}	$V_{\text{R}} = 0\text{V}$, $f = 1\text{MHz}$ Between I/O and I/O		0.35	0.50	pF

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PROTECTION PRODUCTS Typical characteristics

Fig1. 8/20 μ s Pulse Waveform

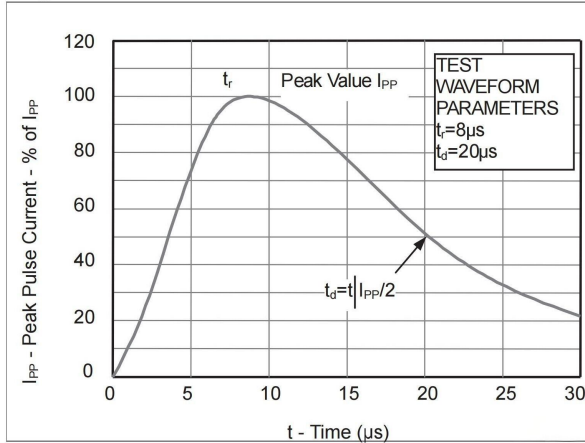


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

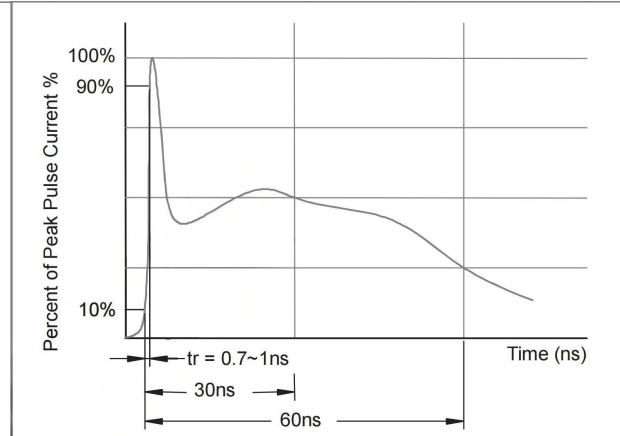
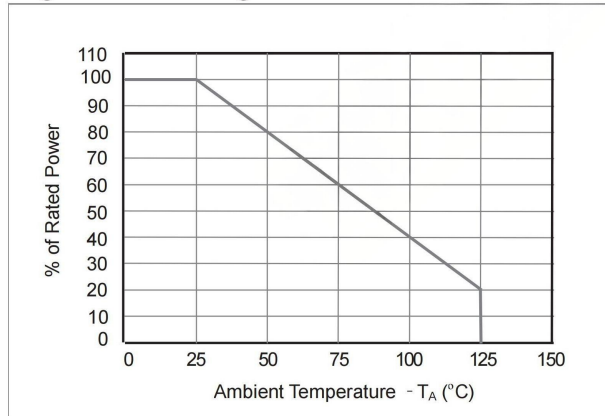


Fig3. Power Derating Curve



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Ordering Information

PREFERRED P/N	PACKAGE	SIZE(mm)	DELIVERY MODE	MPQ(PCS)
	DFN1006-2L	1.00×0.60×0.37	7" REEL	10,000

Recommended Soldering Conditions



Package Outline Dimensions (DFN1006-2L)

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.950	1.050	0.037	0.041
B	0.550	0.650	0.022	0.026
C	0.350	0.450	0.014	0.018
D	0.550	0.650	0.022	0.026
D ₁	0.280	0.380	0.011	0.015
E	0.450	0.550	0.018	0.022
L	0.000	0.100	0.000	0.004

Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
J	0.50	0.60	0.020	0.024
K	0.25	0.35	0.010	0.014
M	0.55	0.65	0.022	0.026