1-Line Ultra Low Capacitance Bi-directional TVS Diode

Description

The EPDFN1821P1 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The EPDFN1821P1 has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with ±25kV air and ±15kV contact discharge. It is assembled into an ultra-small 1.0x 0.6x0.5mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make EPDFN1821P1 an ideal choice to protect cell phone, digital visual interfaces and other high speed ports.

Features

- Ultra small package: 1.0 x0.6 x0.5mm
- Ultra low capacitance: 0.3pF typical
- Ultra low leakage：nA level
- Operating voltage：18V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±25kV
    - Contact discharge: ±15kV
  - IEC61000-4-5 (Lightning) 2A (8/20μs)
- RoHS Compliant
- AEC-Q101 qualified (Automotive grade with suffix " Q".)

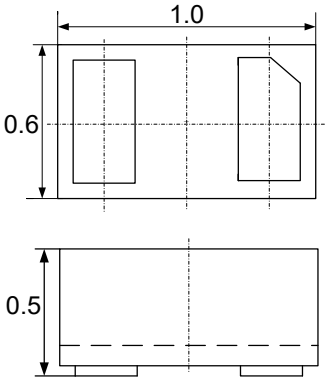
Mechanical Characteristics

- Package: DFN1006-2 (1.0 x0.6 x0.5mm)
- Lead Finish: NiPdAu
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

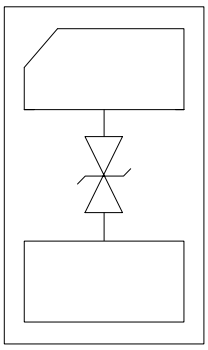
Applications

- Antenna
- Cellular Handsets and Accessories
- Display Ports
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports
- Digital Camera

Dimensions and Pin Configuration

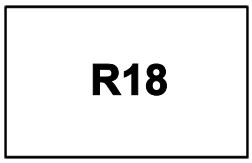


Package Dimensions



Circuit and Pin Schematic

Marking Information



R18 = Device Marking Code

Ordering Information

Part Number	Marking	Packaging	Reel Size
EPDFN1821P1	R18	10000/Tape & Reel	7 inch

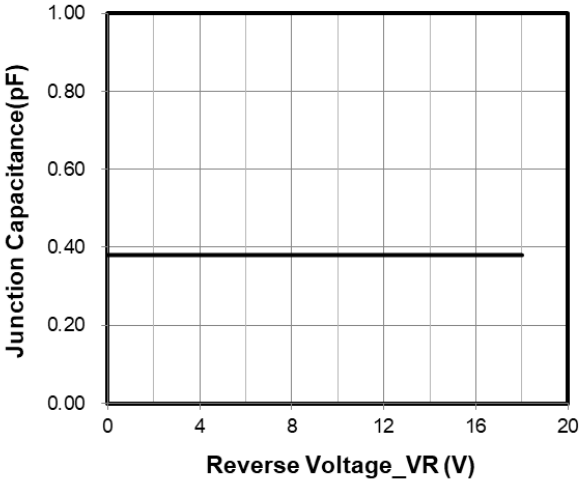
Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20μs)	Ppk	80	W
Peak Pulse Current(8/20μs)	I_{PP}	2	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±25 ±15	kV
Operating Temperature Range	T_J	−55 to +150	°C
Storage Temperature Range	Tstg	−55 to +150	°C

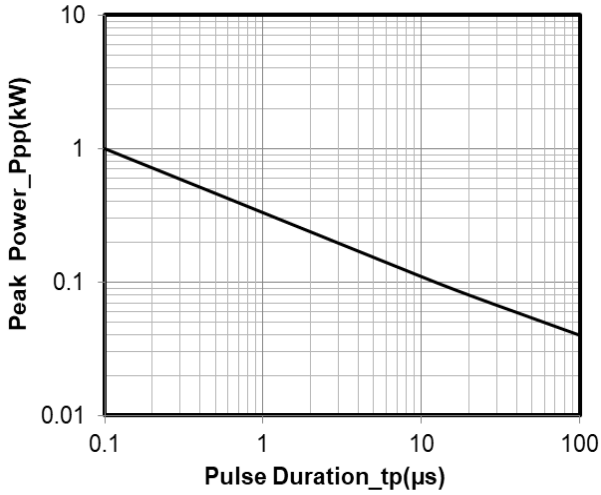
Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			18	V	
Breakdown Voltage	V_{BR}	19.5			V	I_T = 1mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 18V
Clamping Voltage	V_C			40	V	I_{PP} = 2A (8 x 20μs pulse)
Junction Capacitance	C_J		0.3		pF	VR = 0V, f = 1MHz

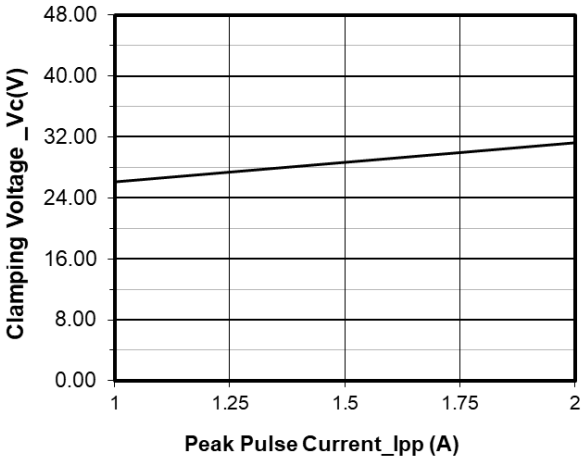
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



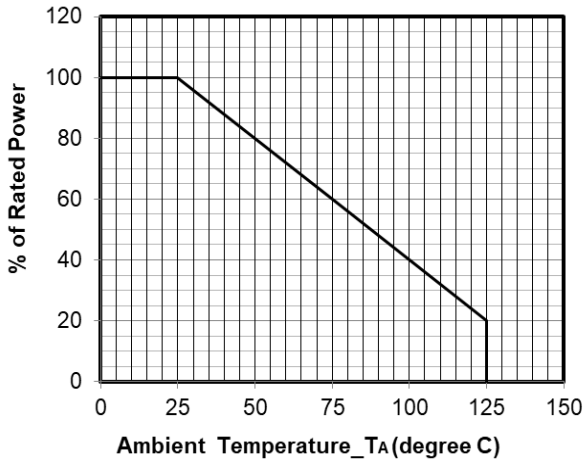
Junction Capacitance vs. Reverse Voltage



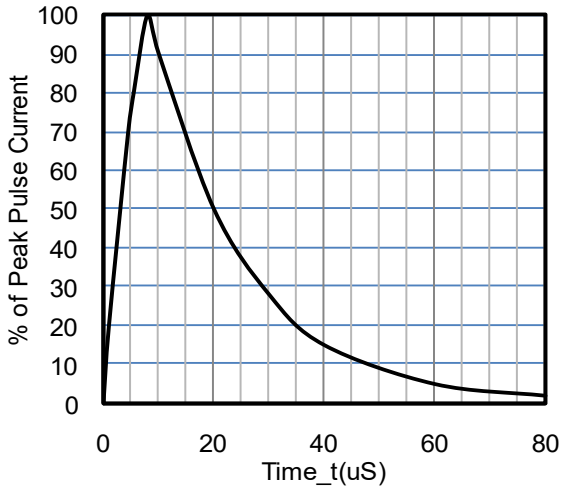
Peak Pulse Power vs. Pulse Time



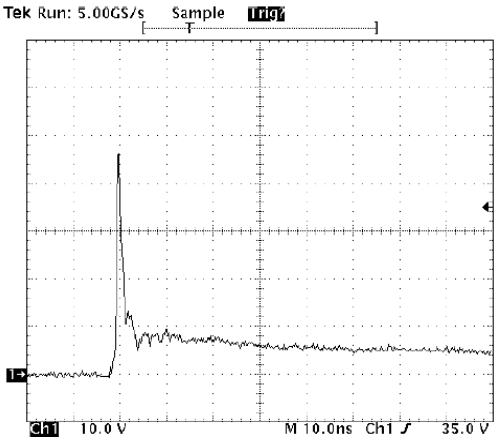
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform

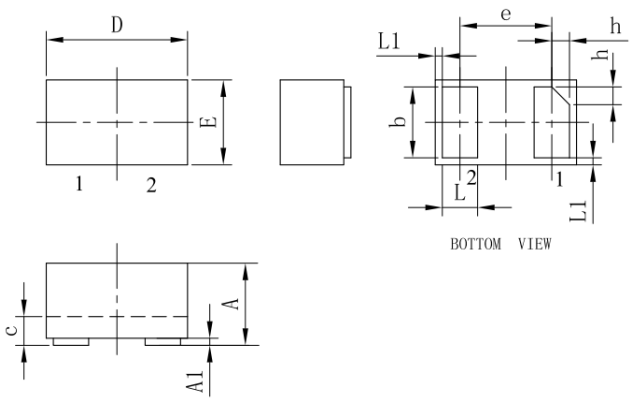


Note：Data is taken with a 10x attenuator

ESD Clamping Voltage

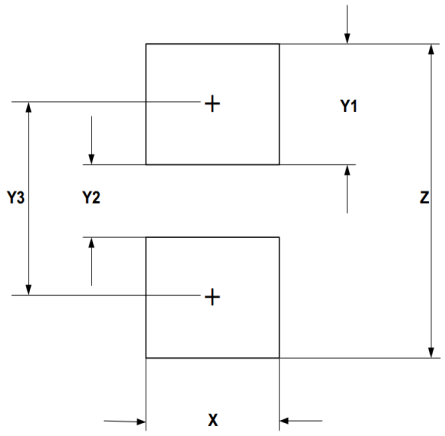
8 kV Contact per IEC61000−4−2

DFN1006-2 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.450	0.500	0.550	0.018	0.020	0.022
A1	0.000	0.020	0.050	0.000	0.001	0.002
b	0.450	0.50	0.550	0.018	0.020	0.022
c	0.120	0.150	0.180	0.005	0.006	0.007
D	0.950	1.000	1.050	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
L1	0.05REF			0.002REF		
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern



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