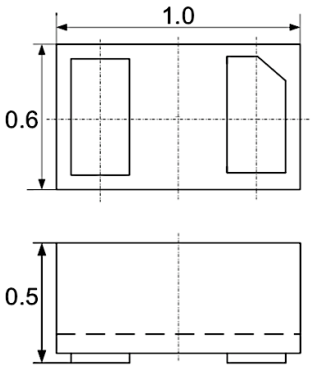
➢ General Description

The PAE1821KP1 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast re- sponse time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The PAE1821KP1 has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) with ±25kV air and ±15kV contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make PAE1821KP1 an ideal choice to protect cell phone, digital visual interfaces and other high speed ports.

➢ Feature

- Ultra small package: 1.0x0.6x0.5mm
- Ultra low capacitance: 0.3pF typical
- Ultra low leakage: nA level
- Working 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
- RoHS Compliant

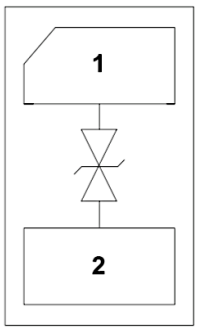
➢ DFN-1006



Package Dimensions

➢ Application

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



Circuit and Pin Schematic

➢ Mechanical Characteristics

- Package: DFN1006 (1.0×0.6×0.5mm)
- Lead Finish: NiPdAu
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below

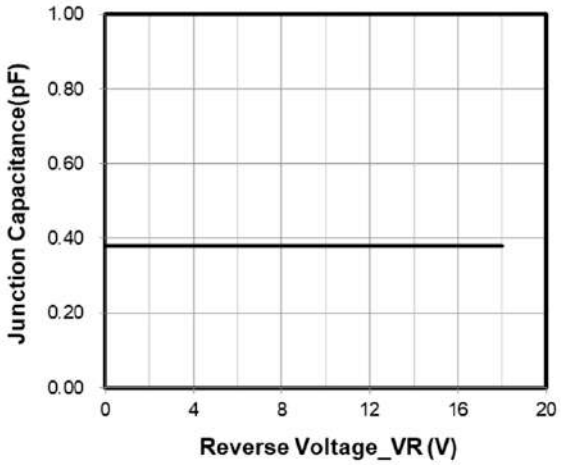
➢ Maximum Ratings (T_A=25°C Unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	80	W
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 +125	℃
Storage Temperature Range	Tstg	−55 to +150	℃

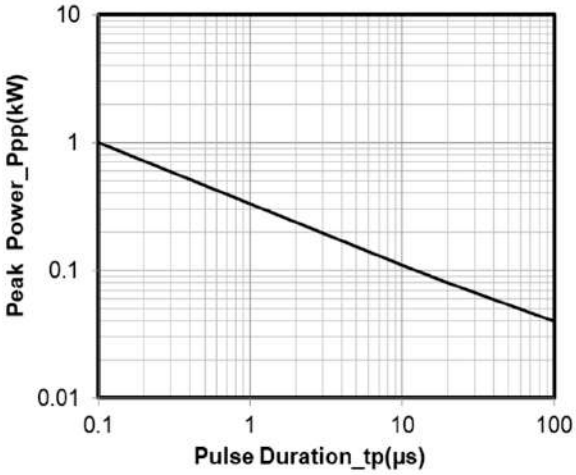
➢ Electrical Characteristics (T_A=25°C Unless otherwise specified)

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

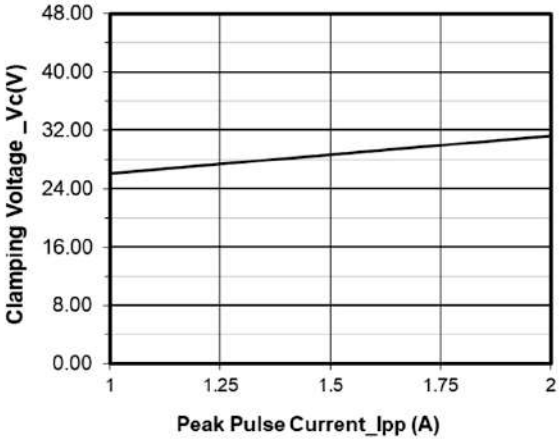
➢ Typical Characteristics



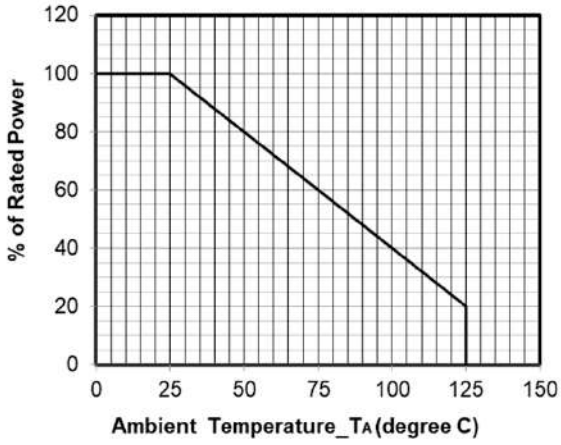
Junction Capacitance vs. Reverse Voltage



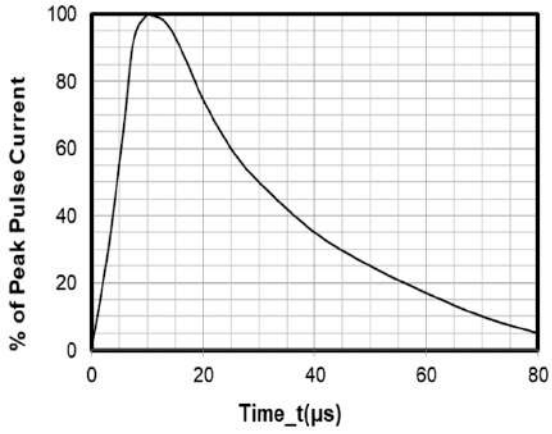
Peak Pulse Power vs. Pulse Time



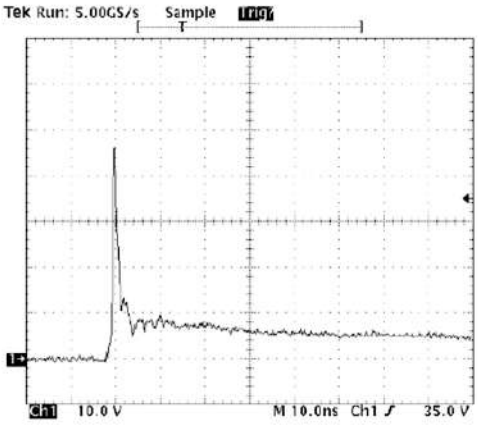
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform

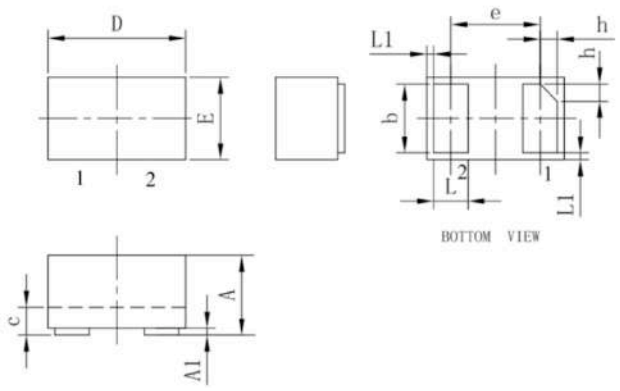


Note：Data is taken with a 10x attenuator

ESD Clamping Voltage

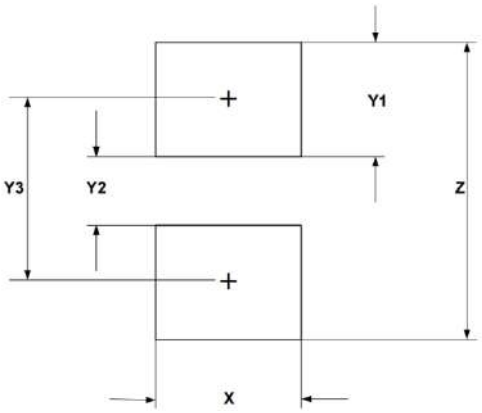
8 kV Contact per IEC61000−4−2

➢ Package Information (DFN1006)



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
L1	0.05REF			0.002REF		
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern

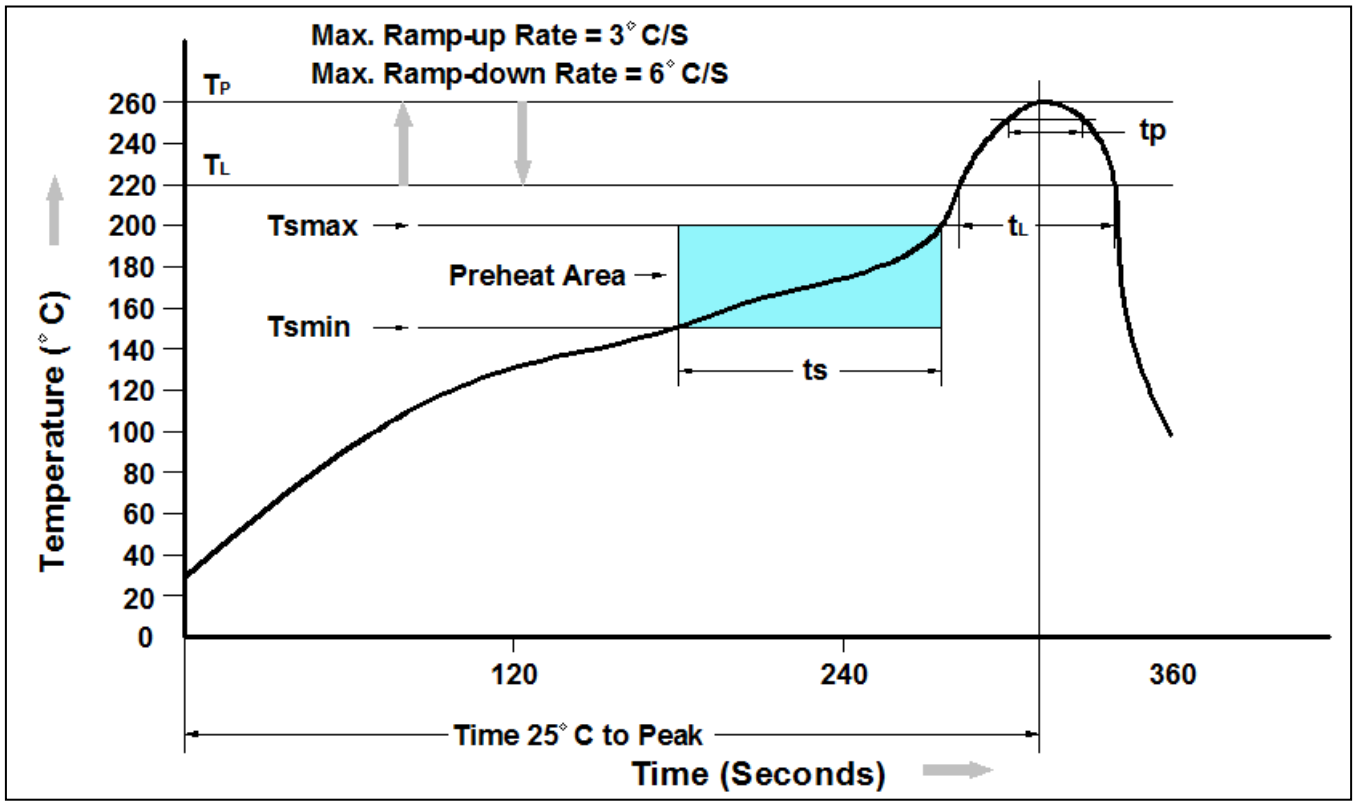


	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052

➢ Ordering Information

Part Number	Description	Quantity
PAE1821KP1	DFN1006 Reel	10000 pcs

➢ Recommand IR Reflow Soldering Thermal Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

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