

➤ General Description

PAE21220R are designed by bi-direction TVS diode, to protect high speed data interfaces. This product has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients). The TVS diode prevents over-voltage on the power line, protecting any downstream components. The low capacitance configuration allows the user to protect high-speed data or transmission lines. This device is optimized for ESD protection of portable electronics. They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge).

➤ Feature

- Transient protection for high-speed data lines to IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact) IEC 61000-4-4 (EFT) 40A (5/50ns)
- Small package saves board space
- Protects up to four I/O lines & power line
- Low capacitance for high-speed interfaces
- Low leakage current and clamping voltage
- Low operating voltage: 12V
- Solid-state silicon-avalanche technology

➤ SOD-323



➤ Application

- USB 2.0 Power and Data Line Protection
- Monitors and Flat Panel Displays
- Digital Visual Interface (DVI)
- 10/100/1000 Ethernet
- Notebook Computer
- SIM Ports
- ATM Interface
- IEEE 1394 Firewire Ports Cellular
- Handsets & Accessories Portable
- Instrumentation
- Digital Cameras
- Video Graphics Cards



➤ **Maximum Ratings (TA=25°C Unless otherwise specified)**

Parameter	Symbol	Typical	Unit
Peak Pulse Power ($t_p = 8/20 \mu s$)	P_{pk}	250	W
Maximum Peak Pulse Current ($t_p = 8/20 \mu s$)	I_{PP}	8	A
ESD per IEC 61000 – 4 – 2 (Air)	V_{PP}	± 15	KV
ESD per IEC 61000 – 4 – 2 (Contact)	V_{PP}	± 8	KV
Operating Junction Temperature	T_J	-55 ~ 125	°C
Storage Temperature Range	T_{STG}	-55 ~ 150	°C
Lead Soldering Temperature	T_L	260 (10sec)	°C

➤ **Electrical Characteristics (TA=25°C Unless otherwise specified)**

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	V_{RWM}	Any Pin to Pin			12	V
Reverse Breakdown Voltage	V_{BR}	$I_t = 10mA$ Any Pin to Pin	13			V
Reverse Leakage Current	I_R	$V_{RWM} = 5V$, $T = 25K$ Any Pin to Pin		0.5	1	μA
Clamping Voltage	V_C	$I_{PP} = 1A$, $t_p = 8/20 \mu s$ Any Pin to Pin			19	V
Clamping Voltage	V_C	$I_{PP} = 8A$, $t_p = 8/20 \mu s$ Any Pin to Pin			25	V
Junction Capacitance	C_j	$V_R = 0V$, $f = 1MHz$ Any Pin to Pin		16	20	pF

➤ Typical Characteristics

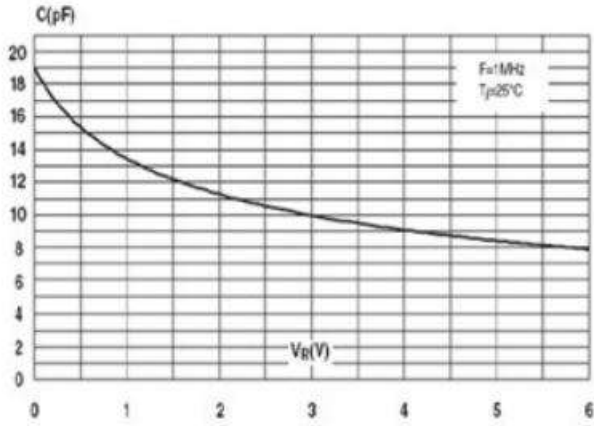


Fig 1 : Junction Capacitance V.S Reverse Voltage Applied

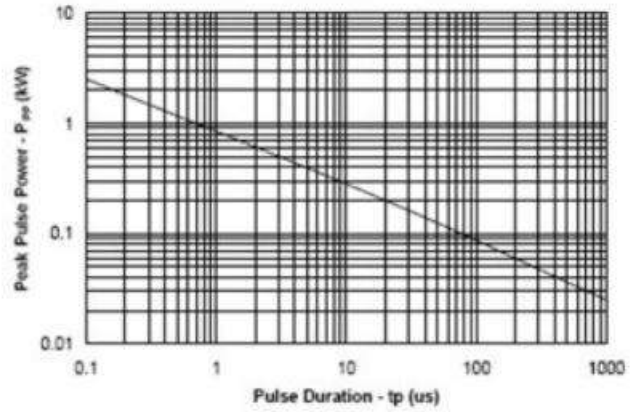


Fig 2 : Peak Plus Power V.S Exponential Plus Duration

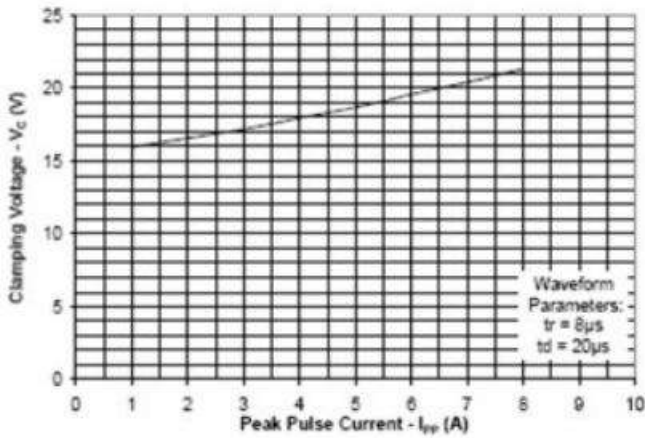


Fig 3 : Clamp Voltage V.S Peak Pulse Current

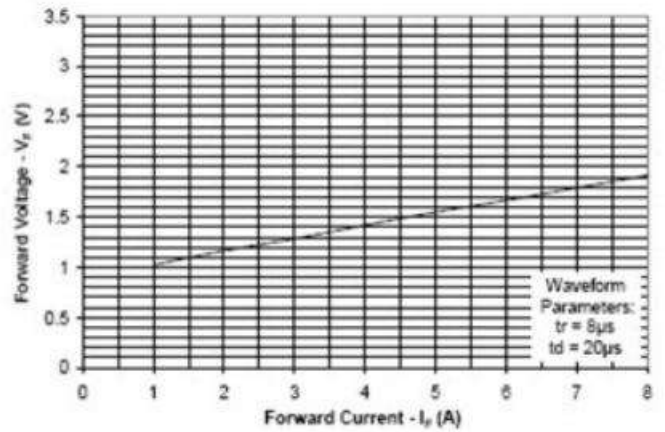


Fig 4 : Forward Voltage Drop V.S Peak Forward

➤ **Application Information**

Device Connection Options

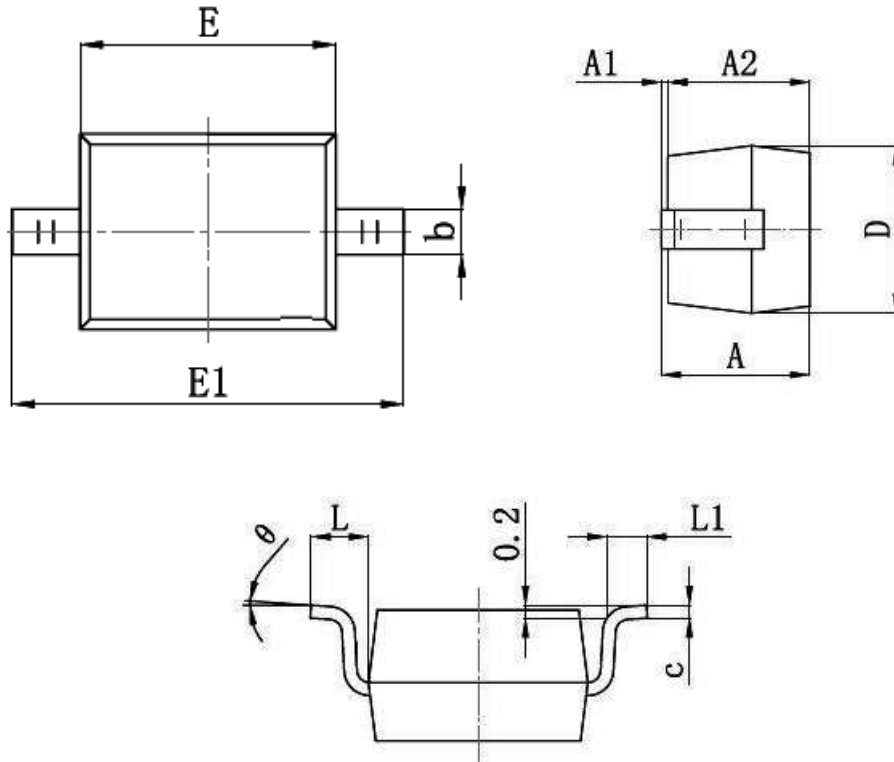
These TVS diodes are designed to protect one data, I/O, or power supply line. The device is bi-directional and may be used on lines where the signal polarity can go above and below ground.

Circuit Board Layout Recommendations for Suppression of ESD.

Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended :

- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
- Never run critical signals near board edges.
- Use ground planes whenever possible.

➤ Package Information (SOD-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A		1.000		0.039
A1	0.000	0.100	0.000	0.004
A2	0.800	0.900	0.031	0.035
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	1.200	1.400	0.047	0.055
E	1.600	1.800	0.063	0.071
E1	2.500	2.700	0.098	0.106
L	0.475 REF		0.019 REF	
L1	0.250	0.400	0.010	0.016
θ	0°	8°	0°	8°

➤ Ordering Information

Part Number	Description	Quantity
PAE21220R	SOD-323 Reel	3000 pcs

DISCLAIMER

- The information in this document and any product described herein are subject to change without notice and should not be construed as a commitment by Paceleader, Paceleader reserve the right to make changes to the information in this document.
- Though Paceleader make effort to improve product quality and reliability, Product can malfunction and fail due to their inherent electrical sensitivity and vulnerability to physical stress, it is the responsibility of the customer, when utilizing Paceleader products, to comply with the standards of safety in making a safe design for entire system and to avoid situation in which a malfunction or failure., In developing a new designs, customer should ensure that the device which shown in this documents are used within specified operatingranges.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by Paceleader for any infringements of patents or other rights of the third parties which may result from its use.