PAE5V0T

Low-Capacitance Bidirectional TVS Diodes for ESD Protection

➢ General Description

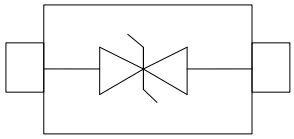
The PAE5V0T is designed with latest Punch-Through process TVS technology to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. Also because of its low capacitance, it is suited for use in high frequency designs such as USB 2.0 high speed, VGA, DVI, SDI and other high speed line applications.

It has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD(electrostatic discharge), and EFT (electrical fast transients).

➢ Feature

- ●Peak Power Dissipation − 60 W (8 x 20 us Waveform)
- ●Stand-off Voltage: 5.0 V
- ●Replacement for MLV (0603)
- ●Protects I/O Port
- ●Low Clamping Voltage
- ●Low Leakage
- ●Low Capacitance
- ●Low capacitance (<6.0pF) for high-speed interfaces
- ●No insertion loss to 1.0GHz
- ●Response Time is < 1 ns
- ●Meets MSL 1 Requirements
- ●ROHS compliant
- ●Solid-state Punch-Through TVS Process technology

➢ SOD-523



➢ Application

- ●High Speed Line :USB1.0/2.0, VGA
- ●Serial and Parallel Ports
- ●Notebooks, Desktops, Servers
- ●Projection TV
- ●Cellular handsets and accessories
- ●Portable instrumentation
- ●Peripherals

➢ Protection solution to meet

- ●IEC61000-4-2 (ESD) ±20kV (air), ±20kV (contact)
- ●IEC61000-4-4 (EFT) 40A (5/50ns)

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

Parameter		Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)		P_{PPP}	60	Watts
ESD Rating per IEC61000-4-2：	Contact		±20	KV
	Air		±20	
Lead Soldering Temperature		T_L	260 (10 sec.)	℃
Operating Temperature Range		T_J	-55 ~ 150	℃
Storage Temperature Range		T_{STG}	-55 ~ 150	℃
Lead Solder Temperature − Maximum (10 Second Duration)		T_L	260	℃

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

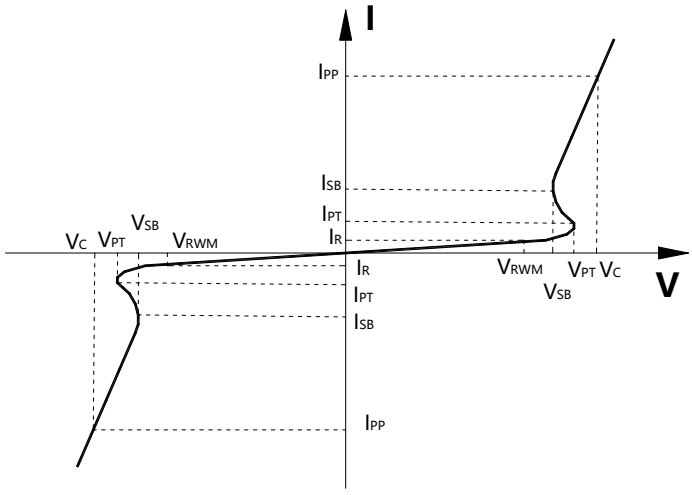
*Other voltages may be available upon request.

1. Non-repetitive current pulse, per Figure 1.

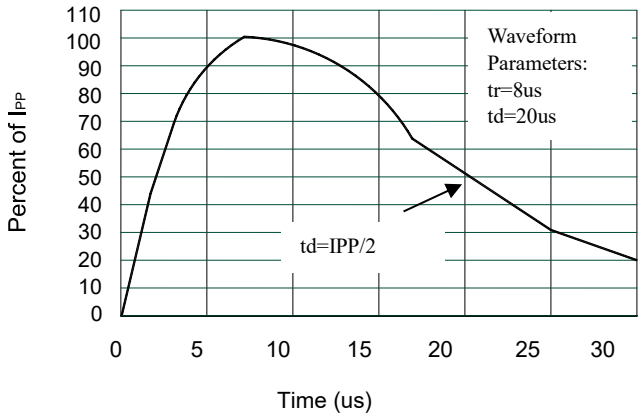
➢ Electrical Characteristics (T_A=25 C Unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	Pin1 to Pin2;Pin2 to Pin1			5	V
I_R	Reverse Leakage Current	V_{RWM} = 5V, Pin1 to Pin2;Pin2 to Pin1		0.05	1	uA
V_{SB}	Snap-Back Voltage	I_{SB} = 50mA, Pin1 to Pin2;Pin2 to Pin1	5.2			V
V_C	Clamping Voltage	I_{PP} = 1A, tp =8/20μs, Pin1 to Pin2;Pin2 to Pin1			9	V
C_J	Junction Capacitance	V_R = 2V, f = 1MHz, Pin1 to Pin2;Pin2 to Pin1		12		pF

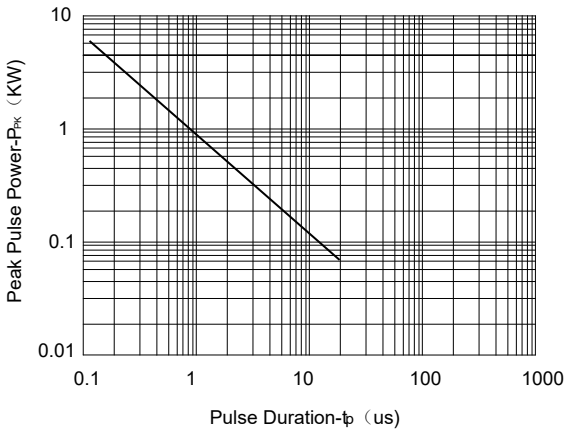
Symbol	Parameter
V_{RWM}	Working Peak Reverse Voltage
V_{PT}	Punch-Through Voltage@ I_{PT}
V_{SB}	Snap-Back Voltage@ I_{SB}
V_C	Clamping Voltage @ I_{PP}
I_T	Test Current
I_{RM}	Leakage current at V_{RWM}
I_{PP}	Peak pulse current
C_O	Off-state Capacitance
C_J	Junction Capacitance



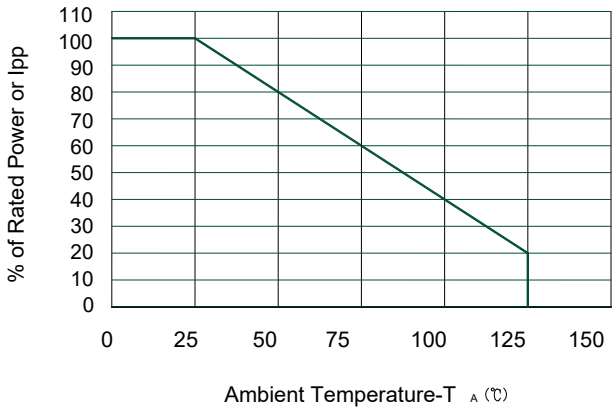
➢ Typical Characteristics



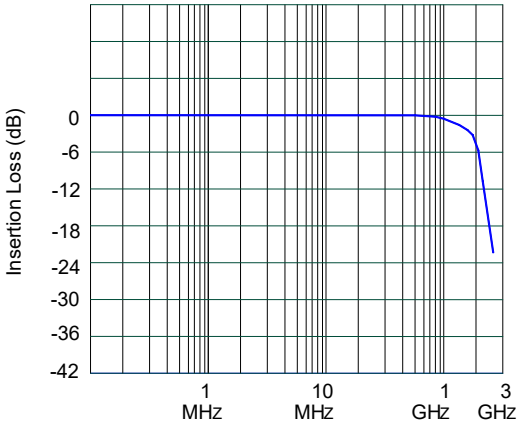
Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time

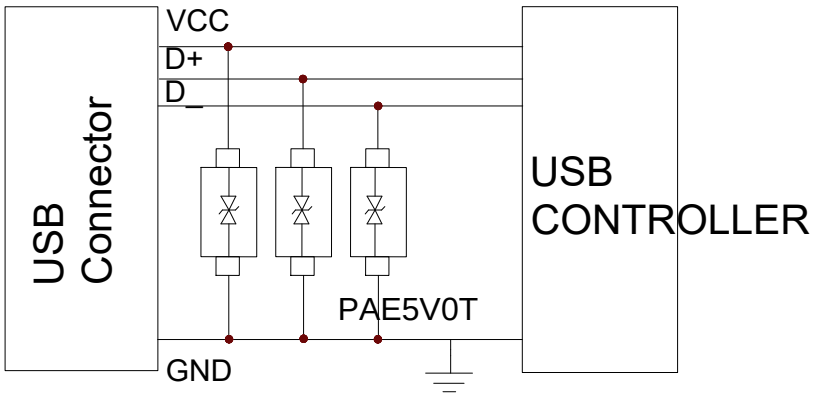


Power Derating Curve

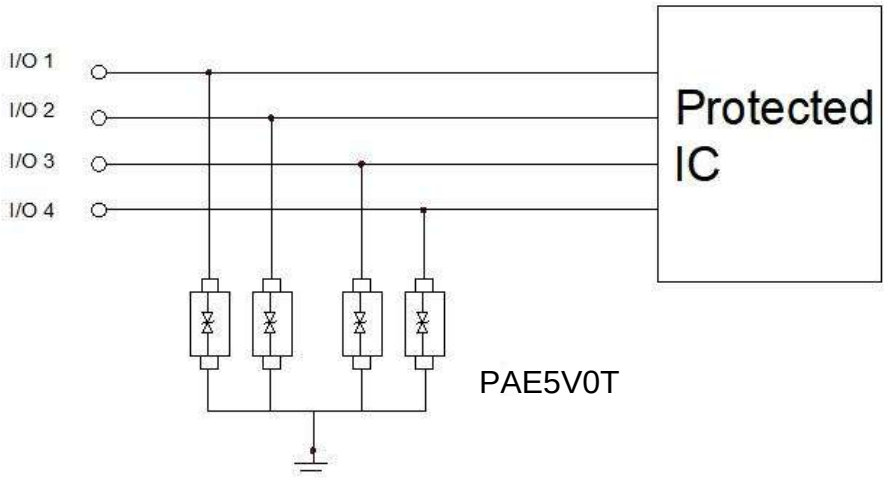


Insertion Loss S21

➢ Typical applications



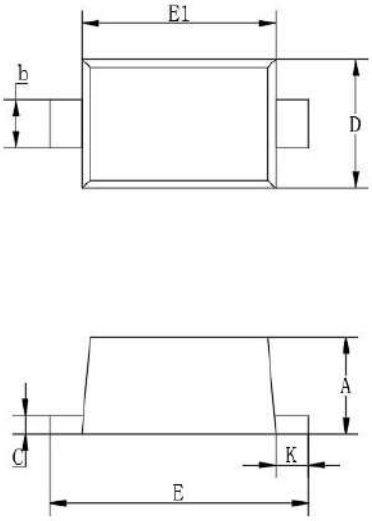
USB Protection For ESD



I/O Line Protection

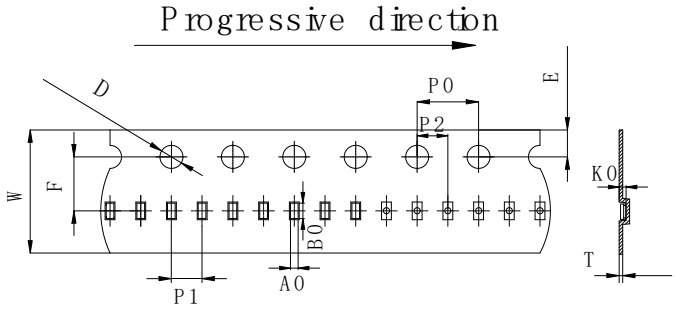
➢ Package Information (SOD-523)

Case Material: Molded Plastic. UL Flammability

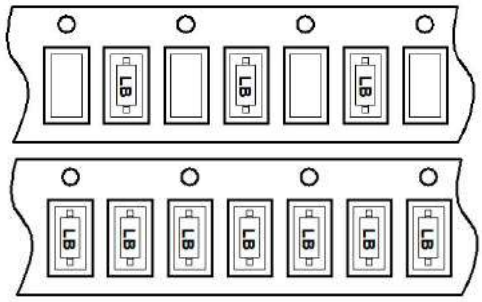


DIM	Millimeters	
	Min	Max
E1	1.10	1.30
D	0.75	0.85
A	0.51	0.70
b	0.25	0.40
C	0.08	0.15
K	0.15	0.25
E	1.50	1.70

SOD-523 Reel Dim



Device Orientation in Tape

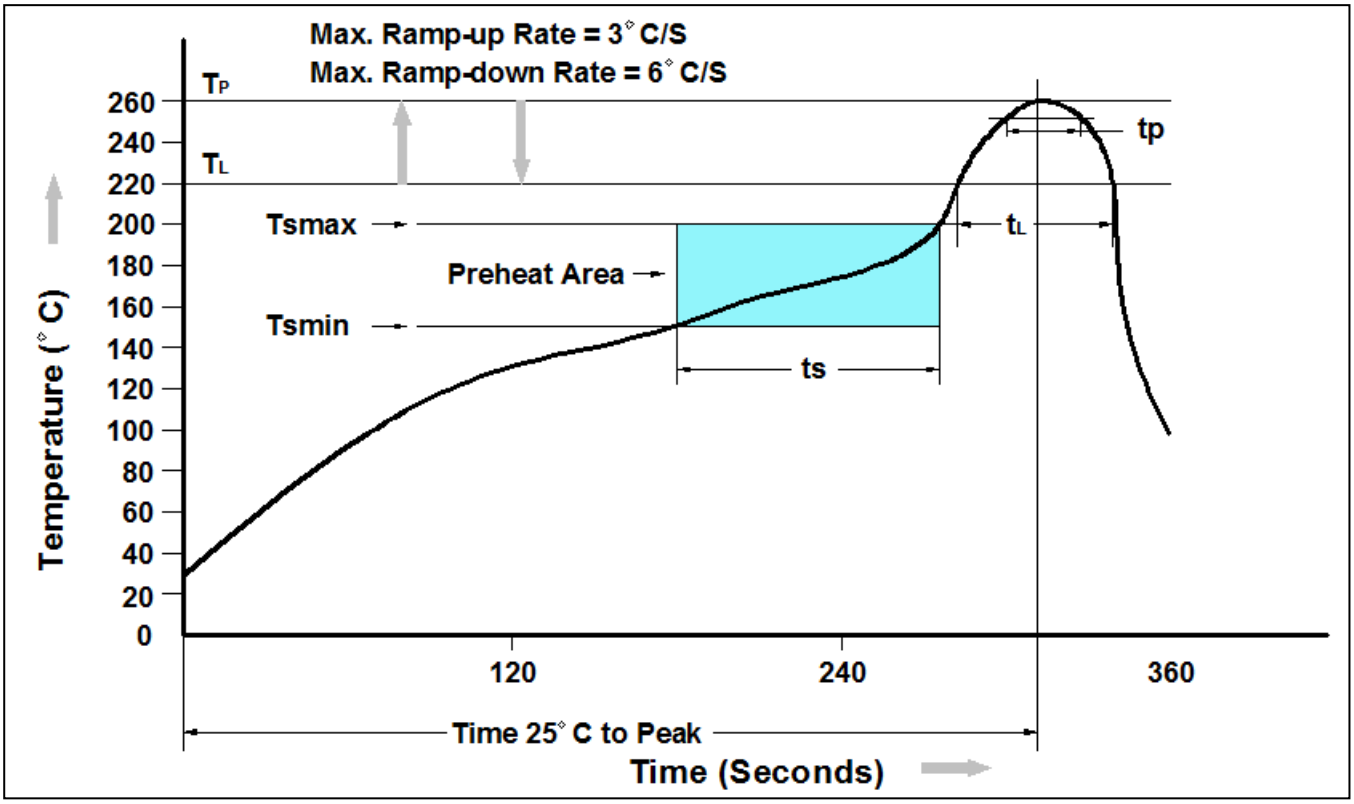


PACKAGE	W	E	F	P0	D	P2	P1	T	A0	B0	K0
SOD-523	8mm ±0.1	1.75mm ±0.1	3.5mm ±0.1	4mm ±0.1	1.5mm ±0.1	2mm ±0.1	2/4mm ±0.1	0.23mm ±0.05	0.9mm ±0.05	1.9mm ±0.1	0.8mm ±0.05

Ordering Information

Part Number	Description	Quantity
PAE5V0T	SOD-523/Reel	3000 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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