

### ➤ General Description

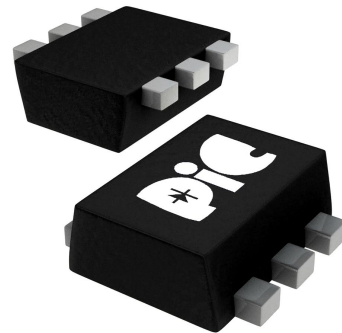
The PAE0504SU provides a typical line to line capacitance of 0.45pF and low insertion loss up to 3GHz providing greater signal integrity making it ideally suited for USB 3.0 applications, such as Digital TVs, DVD players, Computing, set-top boxes and MDDI applications in mobile computing devices.

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

### ➤ Feature

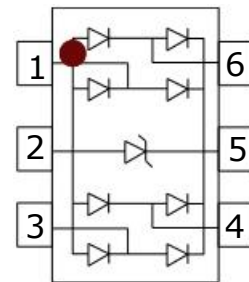
- Protects four I/O lines and one Vcc line
- Low capacitance
- Working voltages : 5V
- Low leakage current
- Low capacitance (<1.2pF) for high-speed interfaces
- No insertion loss to 3.0GHz
- Response Time is < 1 ns
- Meets MSL 1 Requirements
- **Solid-state silicon avalanche technology**
- ROHS compliant

### ➤ SOT-563



### ➤ Application

- Digital Visual Interface (DVI)
- 10/100/1000 Ethernet
- USB 1.1/2.0/3.0/OTG
- IEEE 1394 Firewire Ports
- Projection TV Monitors and Flat Panel Displays
- Notebook Computers
- Set Top Box
- Projection TV



### ➤ Protection solution to meet

- IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- IEC61000-4-5 (Lightning) 5A (8/20µs)

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

Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)	P <sub>PPP</sub>	150	Watts
Peak Pulse Current(tp=8/20μs waveform)	I <sub>PP</sub>	5	A
ESD Rating per IEC61000-4-2:	Contact	8	KV
	Air	15	
Lead Soldering Temperature	T <sub>L</sub>	260 (10 sec.)	°C
Operating Temperature Range	T <sub>J</sub>	-55 ~ 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ 150	°C

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.

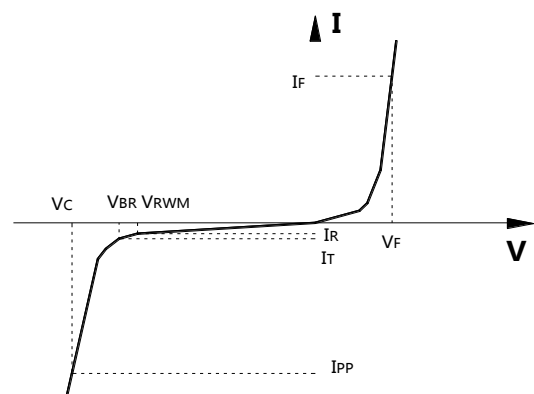
1. Non-repetitive current pulse, per Figure 1.

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

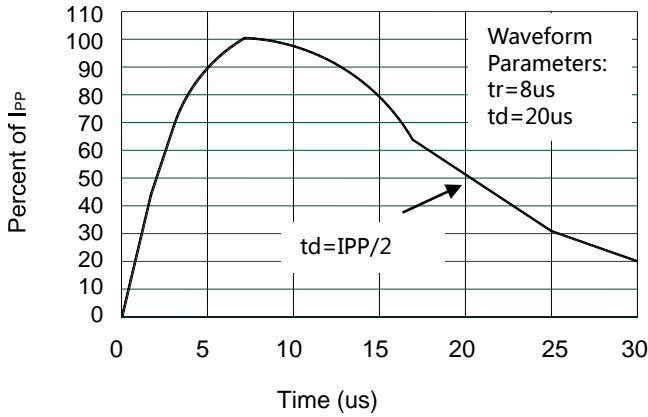
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage	Any I/O to Ground			5.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA, Any I/O to Ground	6.0			V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 5V, Any I/O to Ground			1	μA
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 15mA		0.85	1.2	V
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, tp =8/20μs, any I/O pin to Ground			15.5	V
		I <sub>PP</sub> = 5A, tp =8/20μs, any I/O pin to Ground			40	V
I <sub>PP</sub>	Peak Pulse Current	tp =8/20μs			5	A
C <sub>J</sub>	Junction Capacitance	V <sub>R</sub> = 0V, f = 1MHz, between I/O pins		0.45	0.6	pF
		V <sub>R</sub> = 0V, f = 1MHz, any I/O pin to Ground		0.8	1.2	pF

Junction capacitance is measured in V<sub>R</sub>=0V,F=1MHz

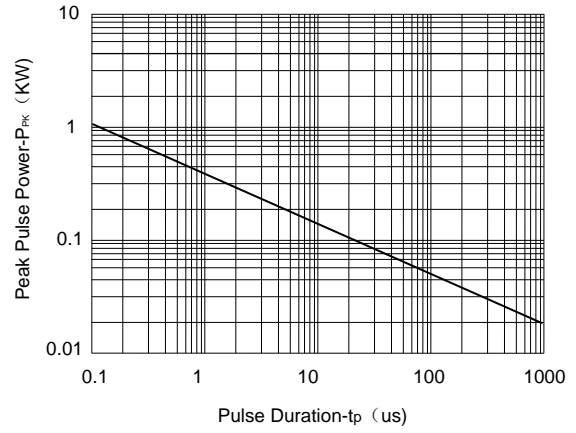
Symbol	Parameter
V <sub>RWM</sub>	Working Peak Reverse Voltage
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>
I <sub>T</sub>	Test Current
I <sub>RM</sub>	Leakage current at V <sub>RWM</sub>
I <sub>PP</sub>	Peak pulse current
C <sub>O</sub>	Off-state Capacitance
C <sub>J</sub>	Junction Capacitance



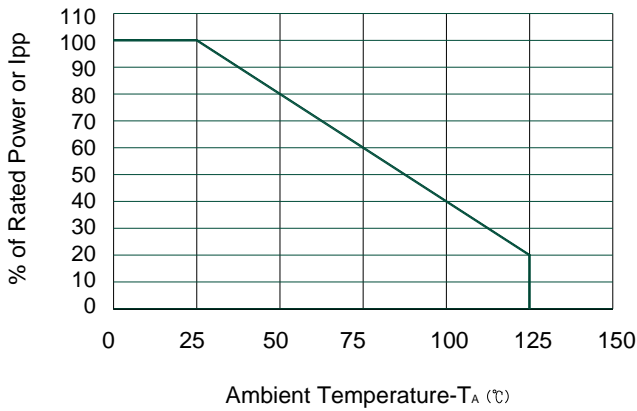
### ➤ Typical Characteristics



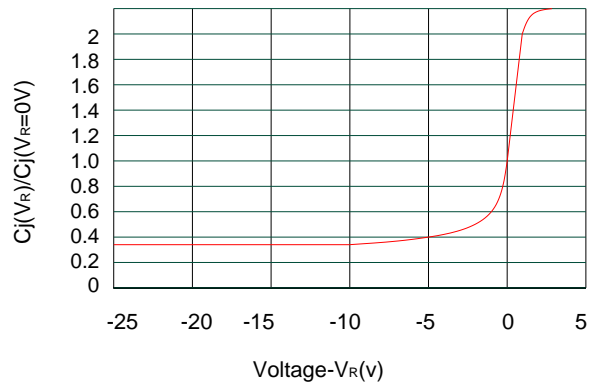
**Pulse Waveform**



**Non-Repetitive Peak Pulse Power vs. Pulse Time**

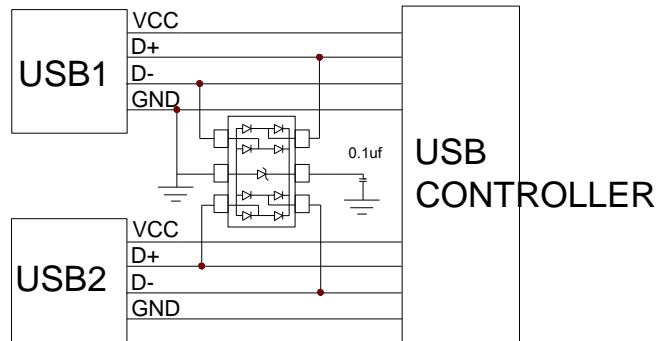


**Power Derating Curve**



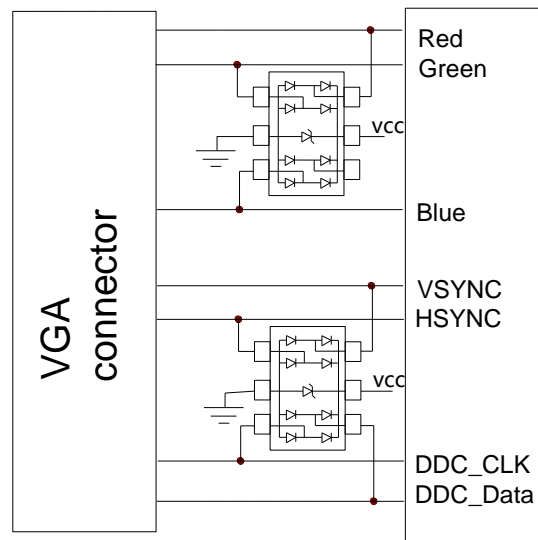
**Junction Capacitance vs. Reverse Voltage**

### ➤ Typical applications



DUAL USB PROTECTION FOR ESD

ESD protection for USB port



ESD protection for VGA port

### ➤ Ordering Information

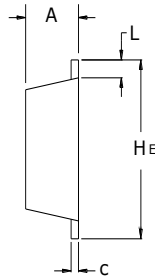
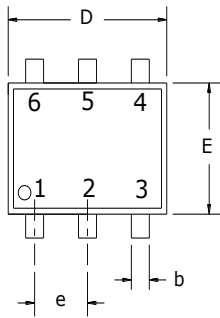
Part Number	Description	Quantity
PAE0504SU	SOT-563 Reel	3000 pcs

### ➤ Package Information (SOT-563)

#### Mechanical Data

Case: SOT-563

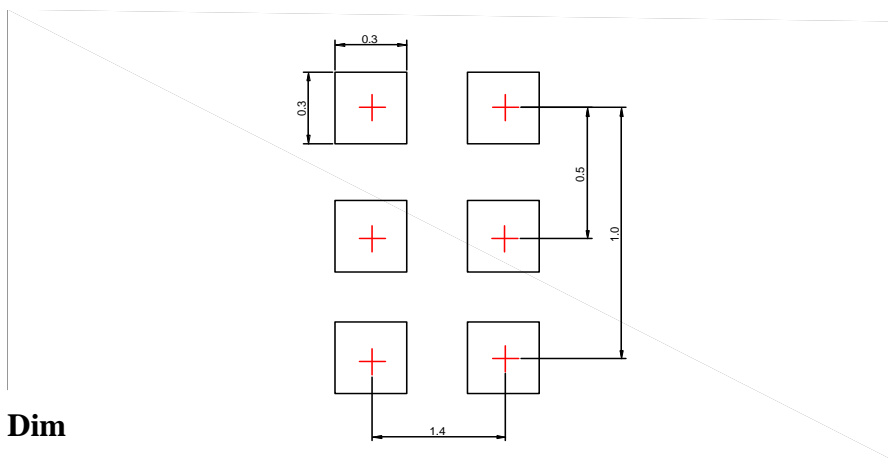
Case Material: Molded Plastic. UL Flammability



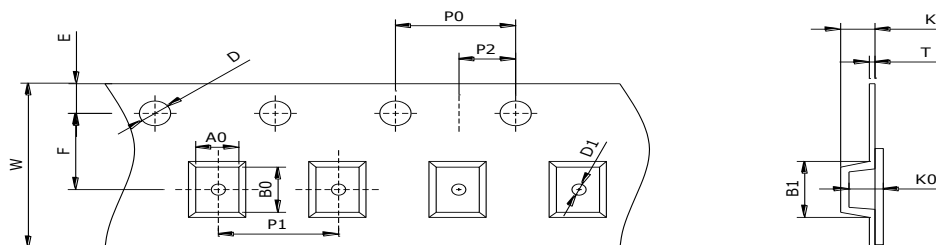
Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.525	0.60	0.021	0.024
b	0.17	0.27	0.007	0.011
c	0.09	0.16	0.004	0.006
D	1.50	1.70	0.059	0.067
E	1.10	1.30	0.043	0.051
e	0.50BSC		0.020BSC	
L	0.10	0.30	0.004	0.012
HE	1.50	1.70	0.059	0.067

SOT-563

#### Recommended Pad outline



SOT-563 Reel Dim



Package	Chip Size	Pocket Size B0×A0×K0(mm)	Tape Width	Reel Diameter	Quantity Per Reel	P0	P1
SOT-563	1.70×1.70×0.60	1.80×1.80×0.70	8mm	178mm(7")	3000	4mm	4mm
D0	D1	E	F	K	T	W	
1.5mm	1.0mm	1.75mm	3.5mm	0.65mm	0.2mm	8mm	

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