

### Features

- ESD Protect for 4 high-speed I/O channels
- Provide ESD protection for each channel to IEC 61000-4-2 (ESD)  $\pm 18\text{kV}$  (air),  $\pm 14\text{kV}$  (contact) IEC 61000-4-4 (EFT) (5/50ns) Level-3, 20A for I/O, 80A for Power IEC 61000-4-5 (Lightning) 6.5A (8/20 $\mu\text{s}$ )
- For below 5V operating voltage
- Low capacitance : 1.3pF typical
- Fast turn-on and Low clamping voltage
- Array of surge rated diodes with internal equivalent TVS diode
- Small package saves board space
- Solid-state silicon-avalanche and active circuit triggering technology
- Green part available

### Ordering Information

Part Number	Qty per Reel	Reel Size
TPESD0504C6	3000	7"

### Mechanical Characteristics

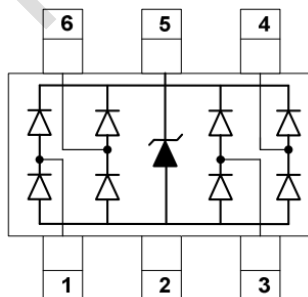
- Package:SOT363
- Lead Finish :Matte Tin
- UL Flammability Classification Rating 94V-0



### Applications

- USB2.0 Power and Data lines protection
- Notebook and PC Computers
- Monitors and Flat Panel Displays
- IEEE 1394 Firewire Ports
- Video Graphics Cards
- SIM ports

### Dimensions and Pin Configuration



Pin Configuration

Absolute Maximum Ratings (T<sub>amb</sub>=25°C unless otherwise specified)

[www.sot23.com.tw](http://www.sot23.com.tw)

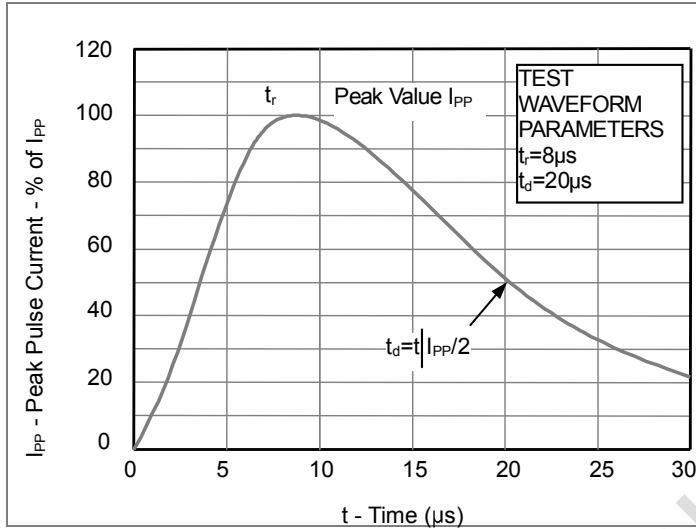
PARAMETER	PARAMETER	RATING	UNITS
Peak Pulse Current (tp =8/20μs)	I <sub>PP</sub>	6.5	A
Operating Supply Voltage (VDD-GND)	V <sub>DC</sub>	6	V
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	18	kV
ESD per IEC 61000-4-2 (Contact)		14	
ESD per IEC 61000-4-2(Air)(VDD-GND)	V <sub>ESD_VDD</sub>	30	kV
ESD per IEC 61000-4-2(Contact) (VDD-GND)		30	
Lead Soldering Temperature	T <sub>SOL</sub>	260 (10 sec.)	°C
Operating Temperature	T <sub>OP</sub>	-55 to +85	°C
Storage Temperature	T <sub>STO</sub>	-55 to +150	°C
DC Voltage at any I/O pin	V <sub>IO</sub>	(GND – 0.5) to (VDD + 0.5)	V

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

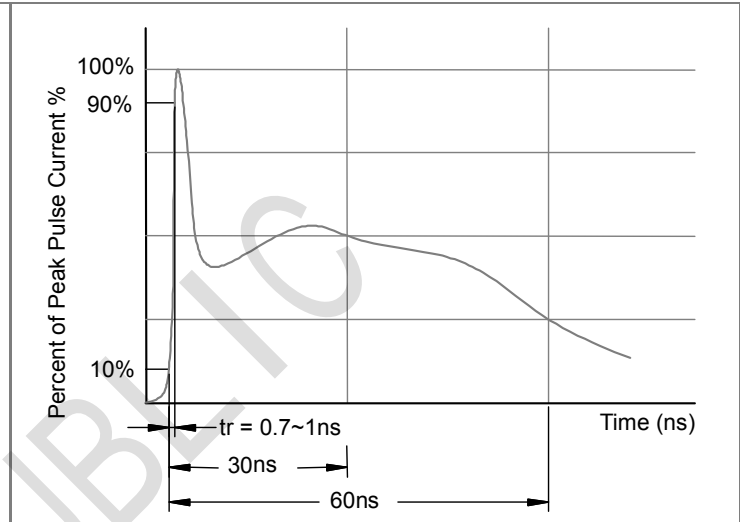
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Reverse Stand-Off Voltage	V <sub>RWM</sub>	Pin 5 to pin 2, T=25 °C			5	V
Reverse Leakage Current	I <sub>Leak</sub>	V <sub>RWM</sub> = 5V, T=25 °C, Pin 5 to pin 2			5	μA
Channel Leakage Current	I <sub>CH_Leak</sub>	V <sub>Pin 5</sub> = 5V, V <sub>Pin 2</sub> = 0V, T=25 °C, V <sub>CH</sub> = 0 ~ 5V			1	μA
Reverse Breakdown Voltage	V <sub>BV</sub>	I <sub>BV</sub> = 1mA, T=25 °C Pin 5 to Pin 2	6		9	V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 15mA, T=25 °C Pin 2 to Pin 5		0.8	1	V
Clamping Voltage	V <sub>CL</sub>	I <sub>PP</sub> =5A, tp=8/20μs, T=25 °C Any Channel pin to Ground		8.1	9	V
ESD Clamping Voltage –I/O	V <sub>clamp_io</sub>	IEC 61000-4-2 +6kV, T=25 °C, Contact mode, Any Channel pin to Ground		12.5		V
ESD Clamping Voltage –VDD	V <sub>clamp_VDD</sub>	IEC 61000-4-2 +6kV, T=25 °C, Contact mode, VDD pin to Ground		9		V
ESD Dynamic Turn-on Resistance –I/O	R <sub>dynamic_io</sub>	IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, Any Channel pin to Ground		0.35		Ω
ESD Dynamic Turn-on Resistance –VDD	R <sub>dynamic_VDD</sub>	IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, VDD pin to Ground		0.2		Ω
Channel Input Capacitance	C <sub>IN</sub>	V <sub>pin5</sub> = 5V, V <sub>pin2</sub> = 0V, V <sub>IN</sub> = 2.5V, f = 1MHz, T=25 °C, Any Channel pin to Ground		1.3	1.6	pF
Channel to Channel Input Capacitance	C <sub>CROSS</sub>	V <sub>pin5</sub> = 5V, V <sub>pin2</sub> = 0V, V <sub>IN</sub> = 2.5V, f = 1MHz, T=25 °C, Between Channel pins		0.12	0.14	pF
Variation of Channel Input Capacitance	ΔC <sub>IN</sub>	V <sub>pin5</sub> = 5V, V <sub>pin2</sub> = 0V, V <sub>IN</sub> = 2.5V, f = 1MHz, T=25 °C, Channel_x pin to Ground - Channel_y pin to Ground		0.05	0.07	pF

**PROTECTION PRODUCTS**  
Typical characteristics

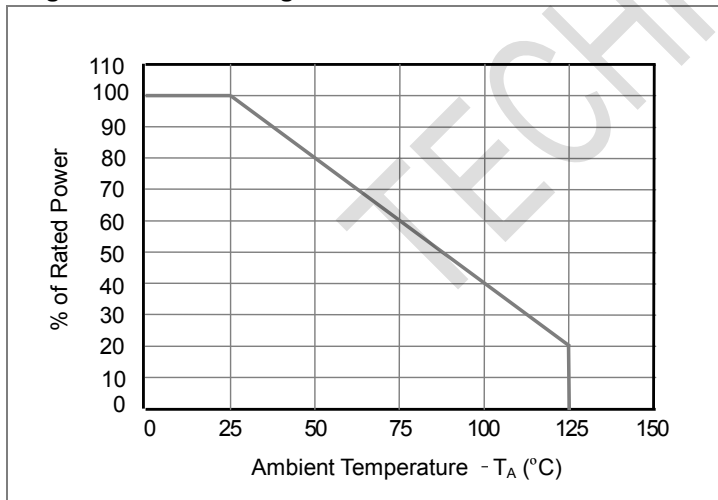
**Fig1. 8/20μs Pulse Waveform**



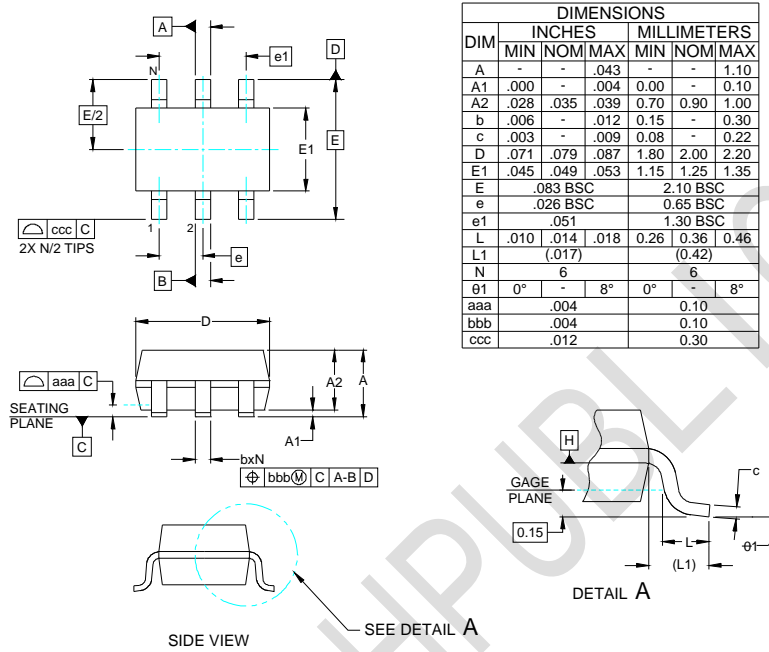
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



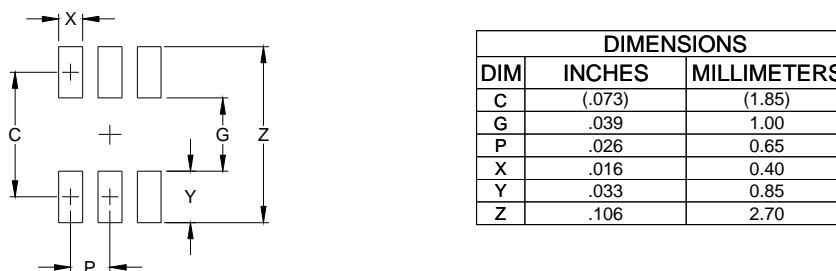
**Fig3. Power Derating Curve**



## Outline Drawing - SOT363



## Land Pattern -SOT363



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