

### 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

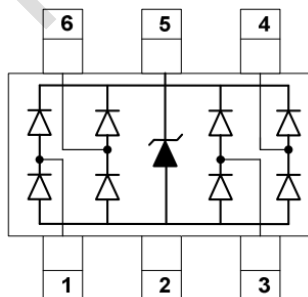
- Package:SOT363
- Lead Finish :Matte Tin
- UL Flammability Classification Rating 94V-0



### 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)

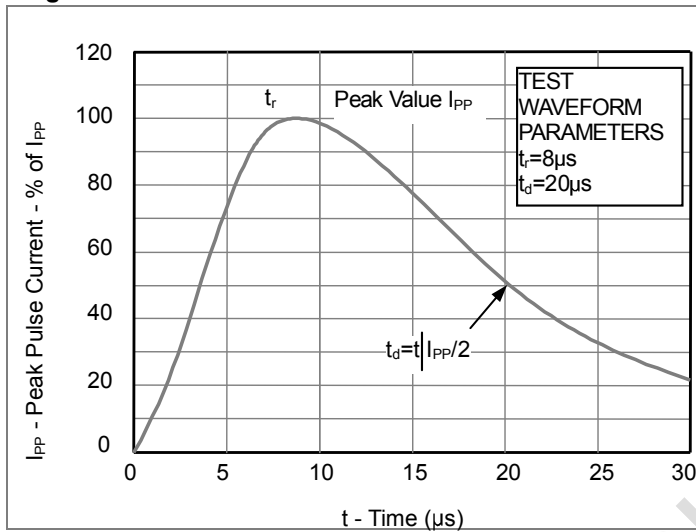
| PARAMETER                                | PARAMETER            | RATING                     | UNITS |
|--|----------------------|----------------------------|-------|
| Peak Pulse Current (tp =8/20μs)          | I <sub>PP</sub>      | 6.5                        | A     |
| Operating Supply Voltage (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)

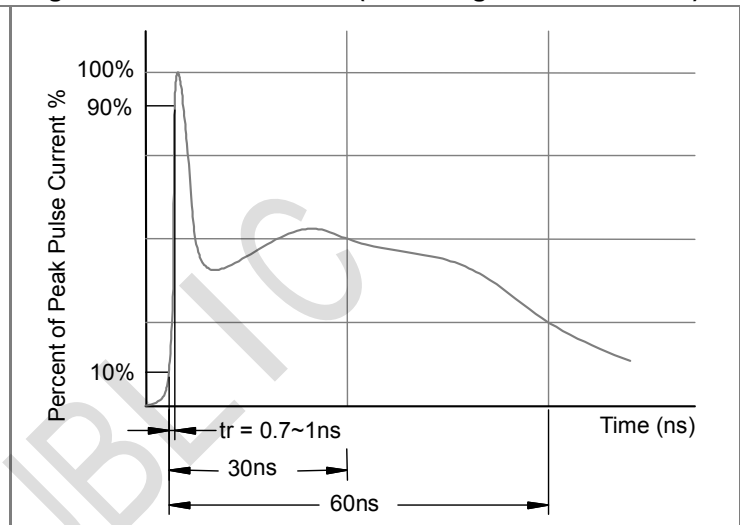
| PARAMETER                              | SYMBOL                   | CONDITIONS   | MIN | TYP  | MAX  | UNITS |
|--|--------------------------|--|-----|------|------|-------|
| Reverse Stand-Off Voltage              | V <sub>RWM</sub>         | Pin 5 to pin 2, T=25 °C  |     |      | 5    | V     |
| 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<br>Pin 5 to Pin 2   | 6   |      | 9    | V     |
| Forward Voltage                        | V <sub>F</sub>           | I <sub>F</sub> = 15mA, T=25 °C<br>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<br>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,<br>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,<br>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,<br>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,<br>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

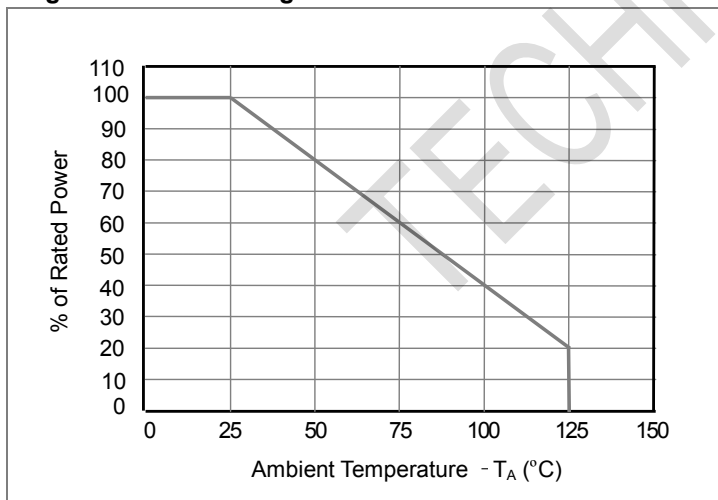
**Fig1. 8/20μs Pulse Waveform**



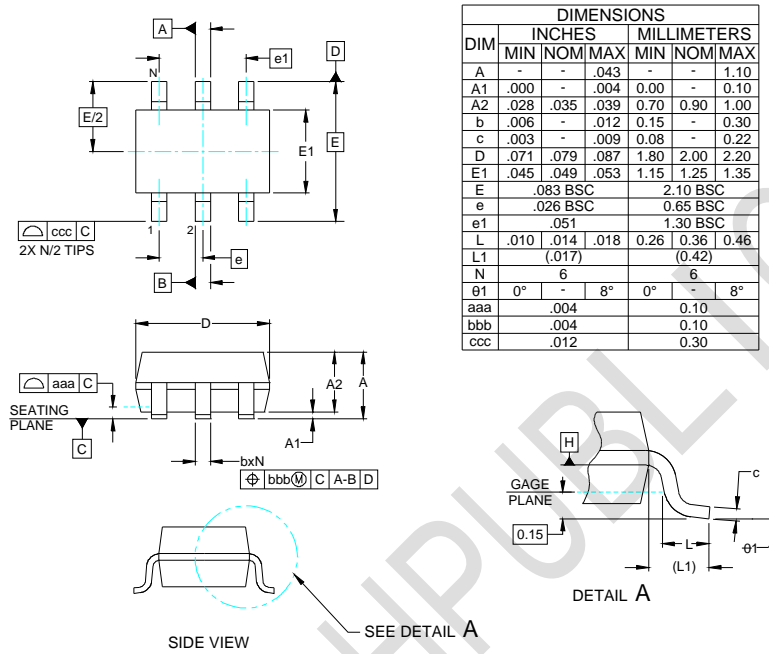
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



**Fig3. Power Derating Curve**



## Outline Drawing - SOT363



## Land Pattern -SOT363

