

## Features

- ◆ Ultra low capacitance: 0.3pF typical (I/O to I/O)
- ◆ Ultra low leakage: nA level
- ◆ Low operating voltage: 5V
- ◆ Low clamping voltage
- ◆ Up to 4 data lines and one power line protects
- ◆ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±20kV
    - Contact discharge: ±15kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ ROHS Compliant

## Ordering Information

| Part Number     | Qty per Reel | Reel Size |
|-----------------|--------------|-----------|
| TPNUP4201MR6T1G | 3000         | 7"        |

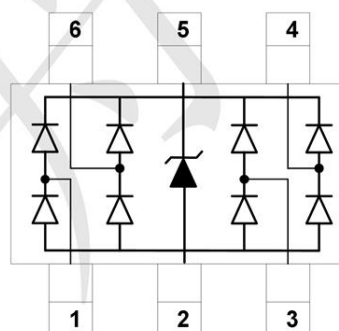
## Mechanical Characteristics

- ◆ Package: SOT23-6
- ◆ Lead Finish: Matte Tin
- ◆ Case Material: "Green" Molding Compound.
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Moisture Sensitivity: Level 3 per J-STD-020

## Applications

- ◆ USB 2.0 and USB 3.0 Ports
- ◆ USB OTG
- ◆ Digital video interface(DVI)
- ◆ Monitor and Flat Panel Displays
- ◆ PCI Express and Serial SATA Ports
- ◆ Gigabit Ethernet
- ◆ IEEE 1394 firewire ports
- ◆ Consumer products (STB, DVD, DSC, DVC...)

## Dimensions and Pin Configuration



Circuit and Pin Schematic

**Absolute Maximum Ratings** (Tamb=25°C unless otherwise specified)

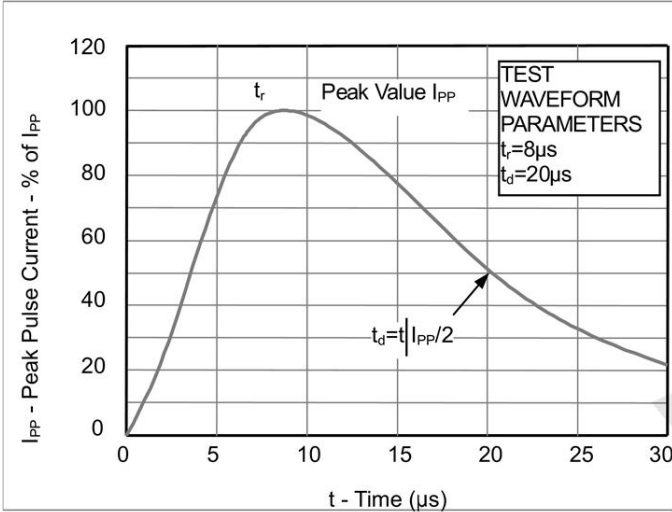
| Parameter                              | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Peak Pulse Power (8/20μs)<br>(Vcc-GND) | P <sub>pk</sub>  | 250         | W    |
| ESD per IEC61000-4-2 (Air)             | V <sub>ESD</sub> | ±20         | kV   |
| ESD per IEC61000-4-2 (Contact)         |                  | ±15         |      |
| Operating Temperature Range            | T <sub>J</sub>   | -55 to +125 | °C   |
| Storage Temperature Range              | T <sub>stg</sub> | -55 to +150 | °C   |

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

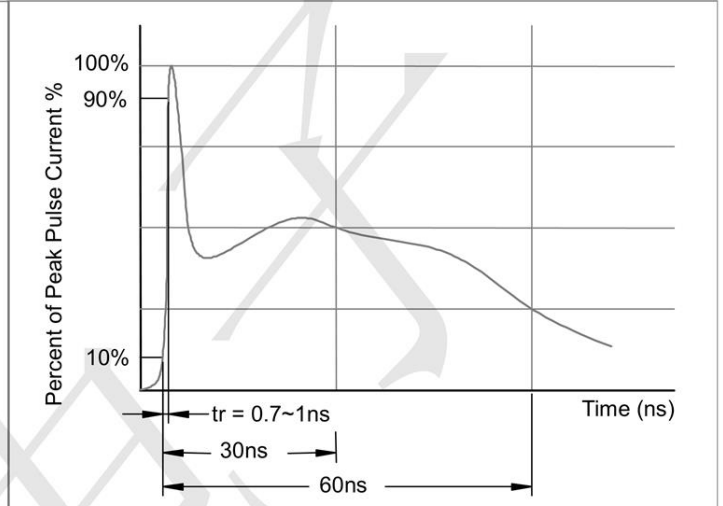
| Parameter                            | Symbol            | Min | Typ | Max | Unit | Test Condition                                |
|--------------------------------------|-------------------|-----|-----|-----|------|---|
| Reverse Working Voltage              | V <sub>RWM</sub>  |     |     | 5   | V    |   |
| Breakdown Voltage                    | V <sub>BR</sub>   | 6   |     | 9.5 | V    | I <sub>T</sub> =1mA                           |
| Leakage Current                      | I <sub>Leak</sub> |     |     | 100 | nA   | V <sub>RWM</sub> =5V                          |
| Clamping Voltage (I/O-GND)           | V <sub>C</sub>    |     |     | 16  | V    | I <sub>PP</sub> =4.5A, T <sub>p</sub> =8/20μs |
| Clamping Voltage(Vcc-GND)            | V <sub>C</sub>    |     |     | 17  | V    | I <sub>PP</sub> =15A, T <sub>p</sub> =8/20μs  |
| Junction Capacitance<br>(I/O to GND) | C <sub>J</sub>    |     | 0.6 | 0.7 | pF   | V <sub>R</sub> =0V, f=1MHz,                   |
| Junction Capacitance<br>(I/O to I/O) | C <sub>J</sub>    |     | 0.3 | 0.5 | pF   | V <sub>R</sub> =0V, f=1MHz,                   |

**PROTECTION PRODUCTS**  
Typical characteristics

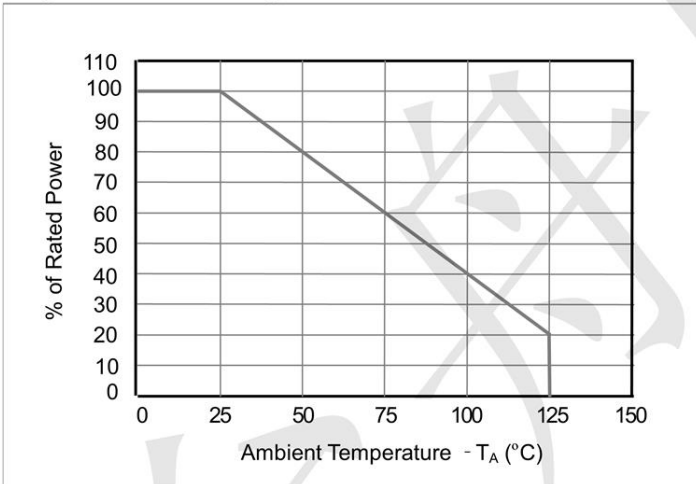
**Fig1. 8/20 $\mu$ s Pulse Waveform**



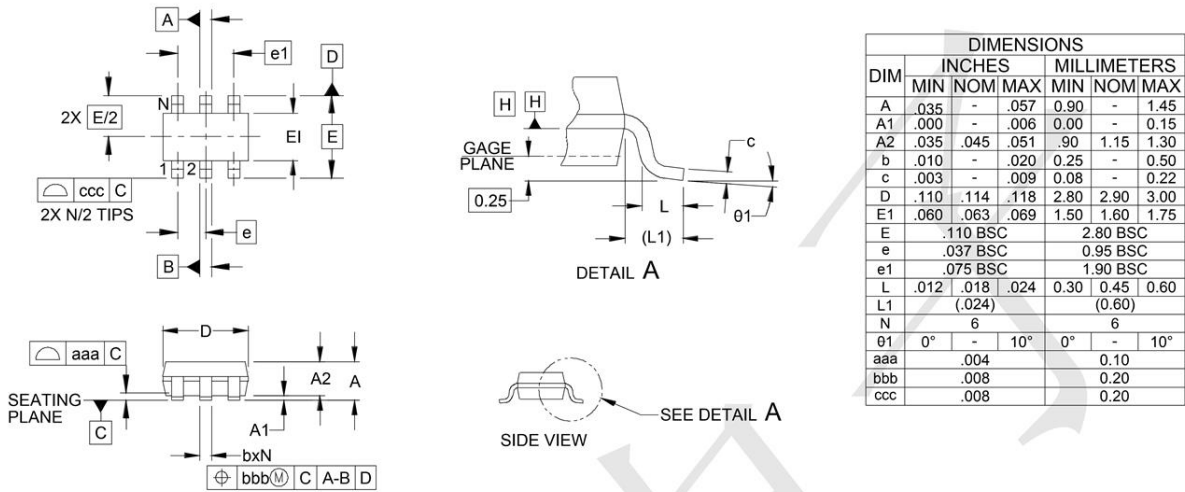
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



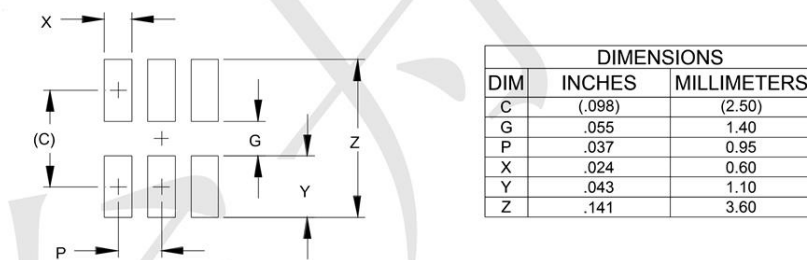
**Fig3. Power Derating Curve**



**Outline Drawing - SOT23-6**



**Land Pattern - SOT23-6**



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