

## 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"

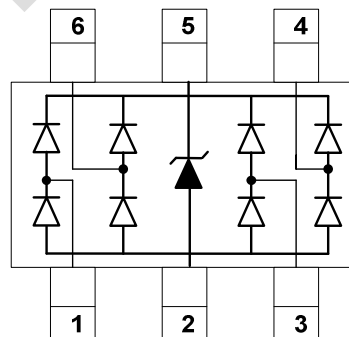
## Mechanical Characteristics

- ◆ 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)

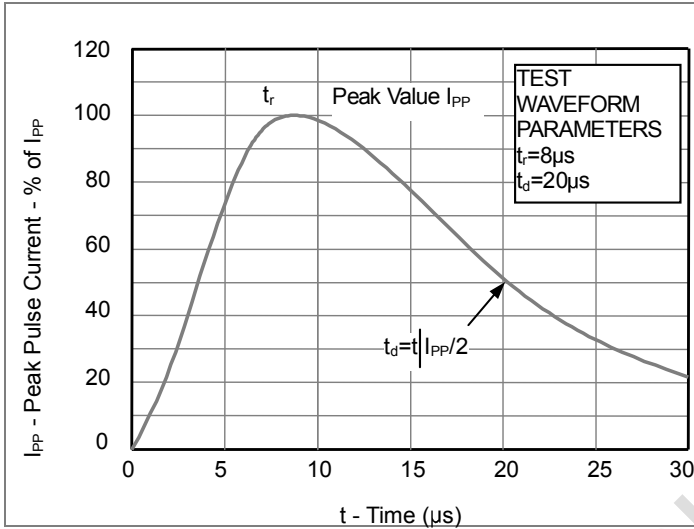
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs) (Vcc-GND)	P <sub>pk</sub>	250	W
ESD per IEC61000-4-2 (Air)	V <sub>ESD</sub>	±20	kV
ESD per IEC61000-4-2 (Contact)		±15	
Operating Temperature Range	T <sub>J</sub>	-55 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

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

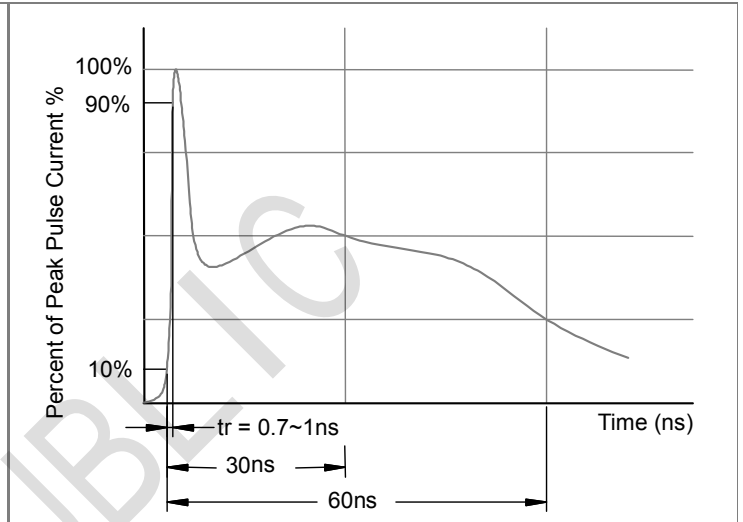
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			5	V	
Breakdown Voltage	V <sub>BR</sub>	6		9.5	V	I <sub>T</sub> =1mA
Leakage Current	I <sub>Leak</sub>			100	nA	V <sub>RWM</sub> =5V
Clamping Voltage (I/O-GND)	V <sub>C</sub>			16	V	I <sub>PP</sub> =4.5A, T <sub>p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

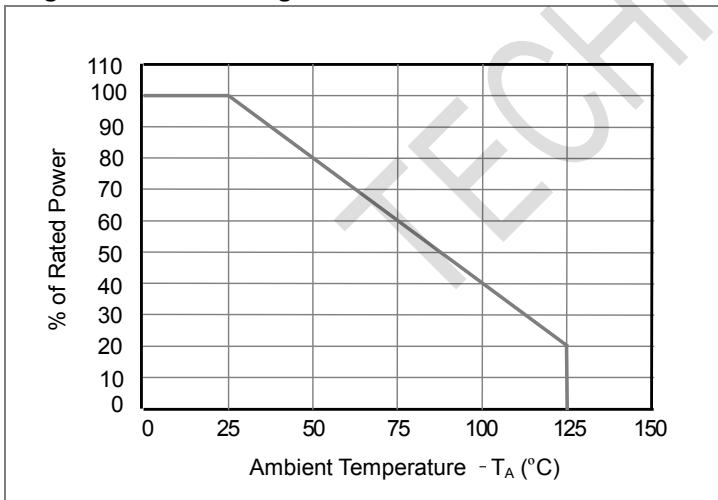
**Fig1. 8/20 $\mu$ s Pulse Waveform**



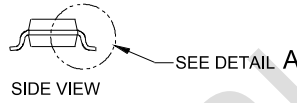
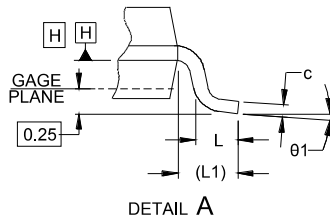
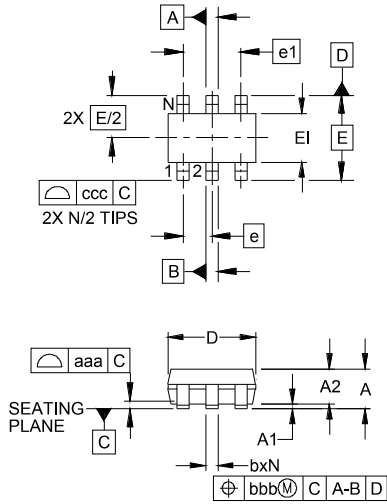
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



**Fig3. Power Derating Curve**

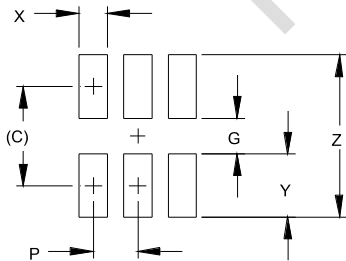


**Outline Drawing - SOT23-6**



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.035	-	.057	0.90	-	1.45
A1	.000	-	.006	0.00	-	0.15
A2	.035	.045	.051	.90	1.15	1.30
b	.010	-	.020	0.25	-	0.50
c	.003	-	.009	0.08	-	0.22
D	.110	.114	.118	2.80	2.90	3.00
E1	.060	.063	.069	1.50	1.60	1.75
E	.110 BSC			2.80 BSC		
e	.037 BSC			0.95 BSC		
e1	.075 BSC			1.90 BSC		
L	.012	.018	.024	0.30	0.45	0.60
L1	(0.024)			(0.60)		
N	6			6		
$\theta_1$	0°	-	10°	0°	-	10°
aaa	.004			0.10		
bbb	.008			0.20		
ccc	.008			0.20		

**Land Pattern - SOT23-6**



DIM	DIMENSIONS	
	INCHES	MILLIMETERS
C	(.098)	(2.50)
G	.055	1.40
P	.037	0.95
X	.024	0.60
Y	.043	1.10
Z	.141	3.60