

# NUP4201MR6

## Low Capacitance TSOP-6 Diode-TVS Array for High Speed Data Lines Protection

The NUP4201MR6 transient voltage suppressor is designed to protect high speed data lines from ESD, EFT, and lighting.

### Features:

- Low Capacitance (3 pF Maximum Between I/O Lines)
- ESD Rating of Class 3B (Exceeding 8 kV) per Human Body model and Class C (Exceeding 400 V) per Machine Model
- Protection for the Following IEC Standards:  
IEC 61000-4-2 (ESD) 15 kV (air) 8 kV (contact)  
IEC 61000-4-4 (EFT) 40 A (5/50 ns)  
IEC 61000-4-5 (lighting) 23 A (8/20  $\mu$ s)
- UL Flammability Rating of 94 V-0
- Pb-Free Package is Available

### Typical Applications:

- High Speed Communication Line Protection
- USB 1.1 and 2.0 Power and Data Line Protection
- Digital Video Interface (DVI)
- Monitors and Flat Panel Displays

### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Power Dissipation 8 x 20 $\mu$ S @ T <sub>A</sub> = 25°C (Note 1)	P <sub>pk</sub>	500	W
Operating Junction Temperature Range	T <sub>J</sub>	-40 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C
Lead Solder Temperature – Maximum (10 Seconds) NUP4201MR6T1 NUP4201MR6T1G	T <sub>L</sub>	235 260	°C °C
Human Body Model (HBM) Machine Model (MM) IEC 61000-4-2 Air (ESD) IEC 61000-4-2 Contact (ESD)	ESD	16000 400 20000 20000	V

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.

1. Non-repetitive current pulse per Figure 1 (Pin 5 to Pin 2)

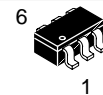
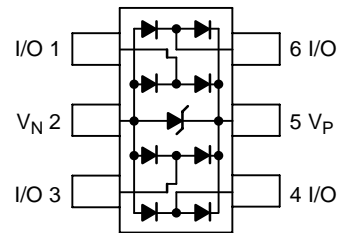


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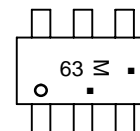
## TSOP-6 LOW CAPACITANCE DIODE TVS ARRAY 500 WATTS PEAK POWER 6 VOLTS

### PIN CONFIGURATION AND SCHEMATIC



TSOP-6  
CASE 318G  
PLASTIC

### MARKING DIAGRAM



63 = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation may vary depending upon manufacturing location.

### ORDERING INFORMATION

Device	Package	Shipping
NUP4201MR6T1	TSOP-6	3000/Tape & Reel
NUP4201MR6T1G	TSOP-6 (Pb-Free)	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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## ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	$V_{RWM}$	(Note 2)			5.0	V
Breakdown Voltage	$V_{BR}$	$I_T=1\text{ mA}$ , (Note 3)	6.0			V
Reverse Leakage Current	$I_R$	$V_{RWM} = 5\text{ V}$			5.0	$\mu\text{A}$
Clamping Voltage	$V_C$	$I_{PP} = 5\text{ A}$ (Note 4)			12.5	V
Clamping Voltage	$V_C$	$I_{PP} = 8\text{ A}$ (Note 4)			20	V
Maximum Peak Pulse Current	$I_{PP}$	$8 \times 20\ \mu\text{s}$ Waveform			25	A
Junction Capacitance	$C_J$	$V_R = 0\text{ V}$ , $f=1\text{ MHz}$ between I/O Pins and GND		3.0	5.0	pF
Junction Capacitance	$C_J$	$V_R = 0\text{ V}$ , $f=1\text{ MHz}$ between I/O Pins		1.5	3.0	pF

- TVS devices are normally selected according to the working peak reverse voltage ( $V_{RWM}$ ), which should be equal or greater than the DC or continuous peak operating voltage.
- $V_{BR}$  is measured at pulse test current  $I_T$ .
- Non-repetitive current pulse per Figure 1 (Pin 5 to Pin 2)

## TYPICAL PERFORMANCE CURVES

( $T_J = 25^\circ\text{C}$  unless otherwise noted)

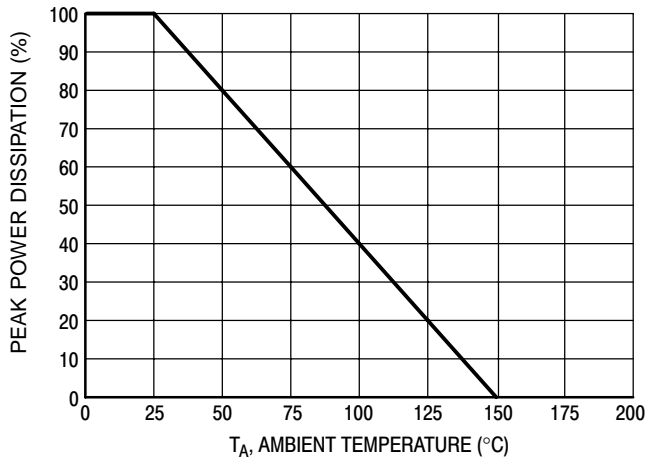


Figure 1. Pulse Derating Curve

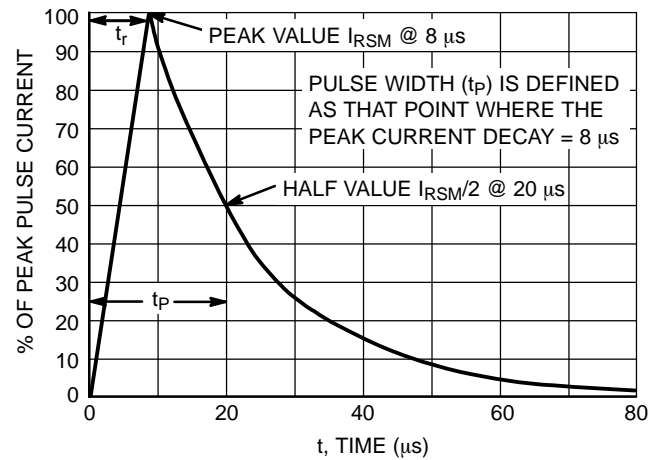


Figure 2.  $8 \times 20\ \mu\text{s}$  Pulse Waveform

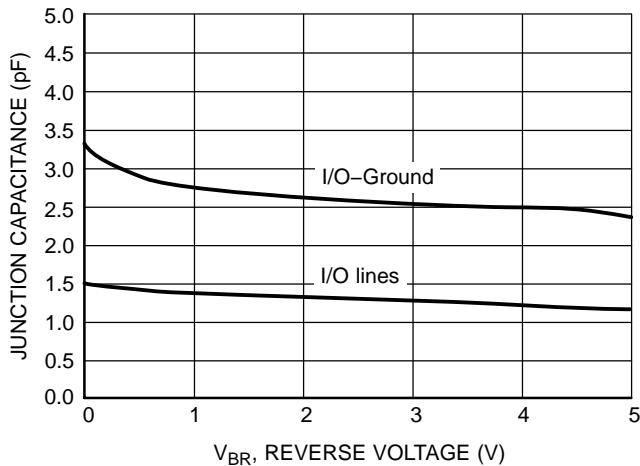


Figure 3. Junction Capacitance vs Reverse Voltage

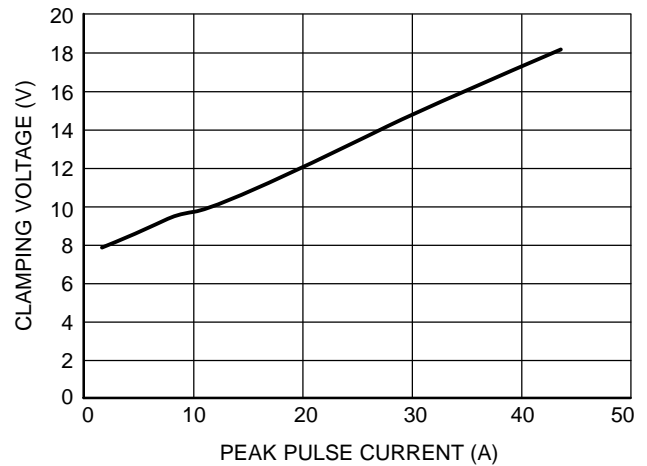
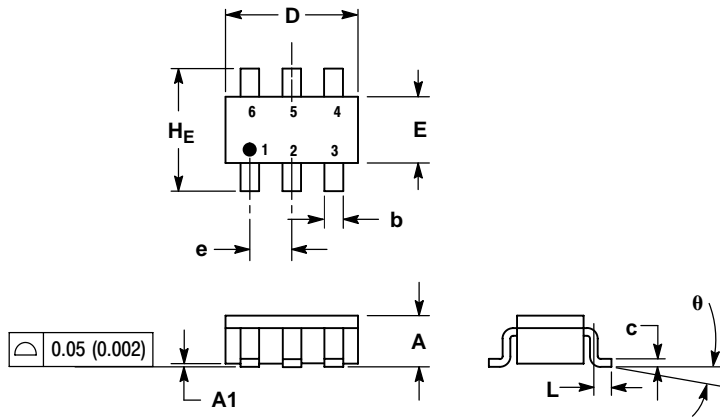


Figure 4. Clamping Voltage vs. Peak Pulse Current ( $8 \times 20\ \mu\text{s}$  Waveform)

# NUP4201MR6

## PACKAGE DIMENSIONS

TSOP-6  
CASE 318G-02  
ISSUE P

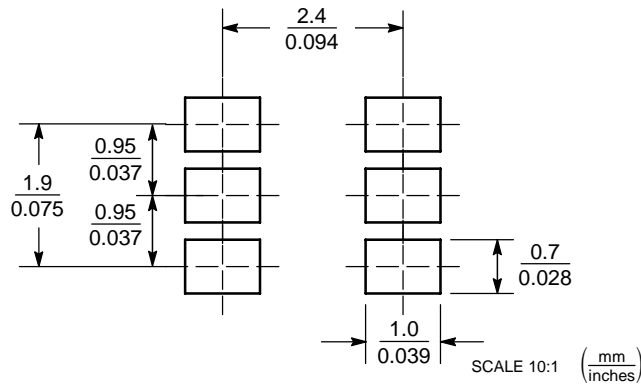


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.38	0.50	0.010	0.014	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	-	10°	0°	-	10°

### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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