

# 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 lightning.

### 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

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

Rating	Symbol	Value	Unit
Peak Power Dissipation 8 x 20 $\mu$ S @ $T_A = 25^\circ\text{C}$ (Note 1)	$P_{pk}$	500	W
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature – Maximum (10 Seconds)	$T_L$	235	$^\circ\text{C}$
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

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

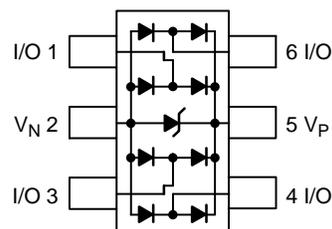


ON Semiconductor®

<http://onsemi.com>

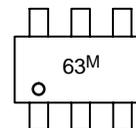
## TSOP-6 LOW CAPACITANCE DIODE TVS ARRAY 500 WATTS PEAK POWER 6 VOLTS

### PIN CONFIGURATION AND SCHEMATIC



TSOP-6  
CASE 318G  
PLASTIC

### MARKING DIAGRAM



63 = Specific Device Code  
M = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
NUP4201MR6T1	TSOP-6	3000/Tape & Reel

# NUP4201MR6

## 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	$I_{PP}$	8x20 $\mu\text{s}$ 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 level.
- $V_{BR}$  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)

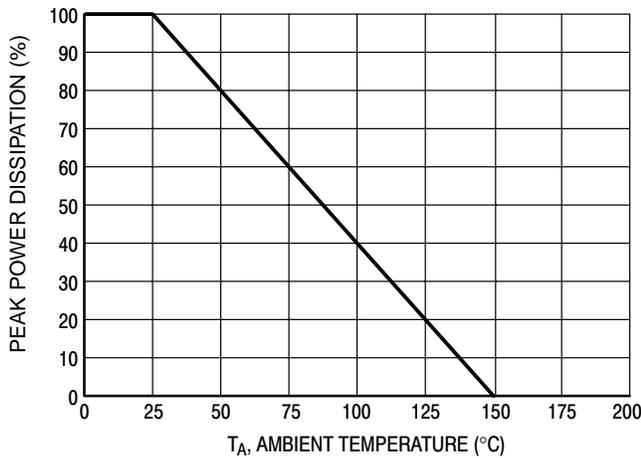


Figure 1. Pulse Derating Curve

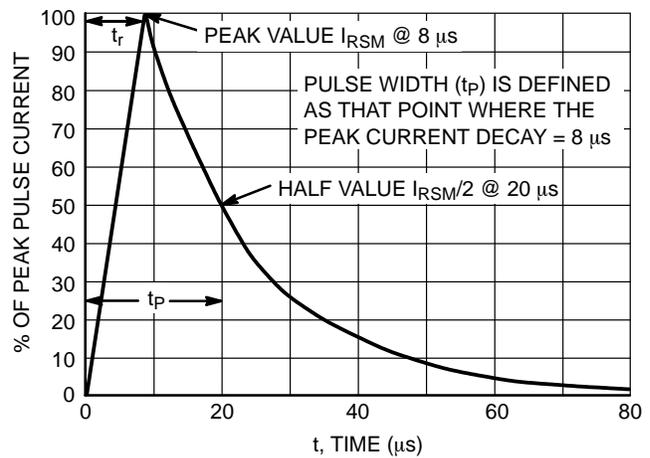


Figure 2.  $8 \times 20\ \mu\text{s}$  Pulse Waveform

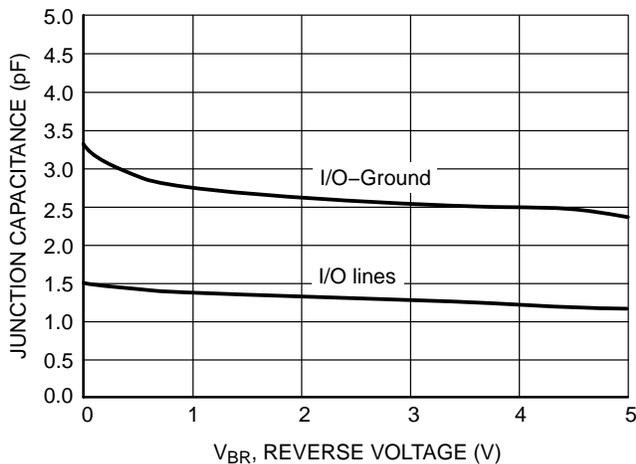


Figure 3. Junction Capacitance vs Reverse Voltage

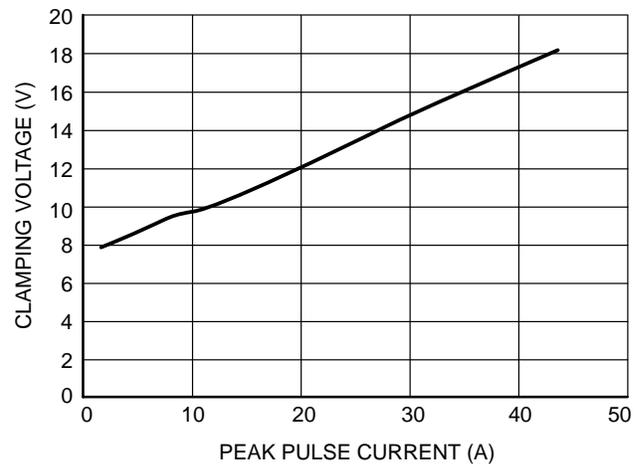
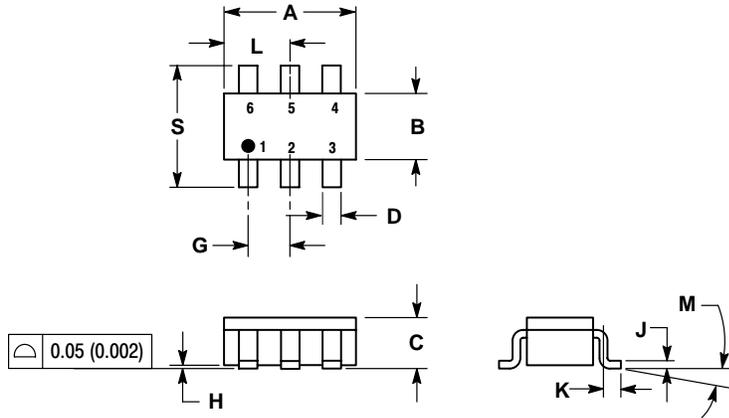


Figure 4. Clamping Voltage vs. Peak Pulse Current ( $8 \times 20\ \mu\text{s}$  Waveform)

# NUP4201MR6

## PACKAGE DIMENSIONS

TSOP-6  
CASE 318G-02  
ISSUE J



**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	MAX	MIN	MAX
A	2.90	3.10	0.1142	0.1220
B	1.30	1.70	0.0512	0.0669
C	0.90	1.10	0.0354	0.0433
D	0.25	0.50	0.0098	0.0197
G	0.85	1.05	0.0335	0.0413
H	0.013	0.100	0.0005	0.0040
J	0.10	0.26	0.0040	0.0102
K	0.20	0.60	0.0079	0.0236
L	1.25	1.55	0.0493	0.0610
M	0	10	0	10
S	2.50	3.00	0.0985	0.1181

**ON Semiconductor** and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

## PUBLICATION ORDERING INFORMATION

### Literature Fulfillment:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada

**JAPAN:** ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
**Phone:** 81-3-5773-3850

**ON Semiconductor Website:** <http://onsemi.com>

For additional information, please contact your local Sales Representative.