

NUP2201MR6

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

The NUP2201MR6 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 μ 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
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

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

Rating	Symbol	Value	Unit
Peak Power Dissipation 8 x 20 μ 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)

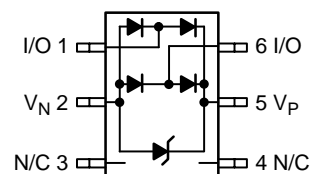


ON Semiconductor®

<http://onsemi.com>

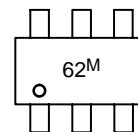
TSOP-6 LOW CAPACITANCE DIODE TVS ARRAY 500 WATTS PEAK POWER 6 VOLTS

PIN CONFIGURATION AND SCHEMATIC



TSOP-6
CASE 318G
PLASTIC

MARKING DIAGRAM



62 = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NUP2201MR6T1	TSOP-6	3000/Tape & Reel
NUP2201MR6T1G	TSOP-6	3000/Tape & Reel

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

NUP2201MR6

ELECTRICAL CHARACTERISTICS (T_J=25°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 mA, (Note 3)	6.0			V
Reverse Leakage Current	I _R	V _{RWM} = 5 V			5.0	μA
Clamping Voltage	V _C	I _{PP} = 5 A (Note 4)			12.5	V
Clamping Voltage	V _C	I _{PP} = 8 A (Note 4)			20	V
Maximum Peak Pulse Current	I _{PP}	8x20 μs Waveform			25	A
Junction Capacitance	C _J	V _R = 0 V, f=1 MHz between I/O Pins and GND		3.0	5.0	pF
Junction Capacitance	C _J	V _R = 0 V, f=1 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°C unless otherwise noted)

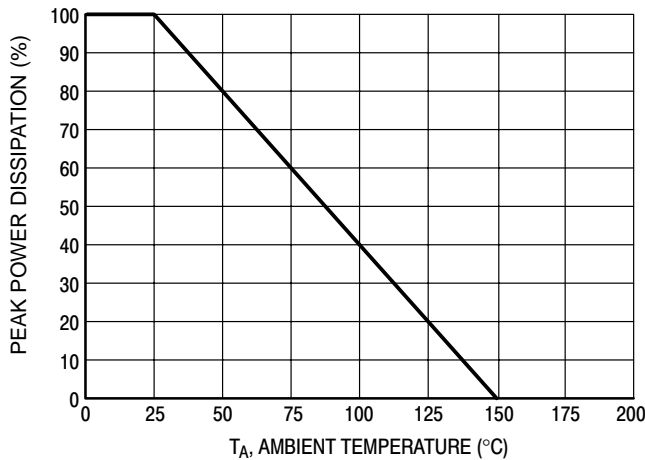


Figure 1. Pulse Derating Curve

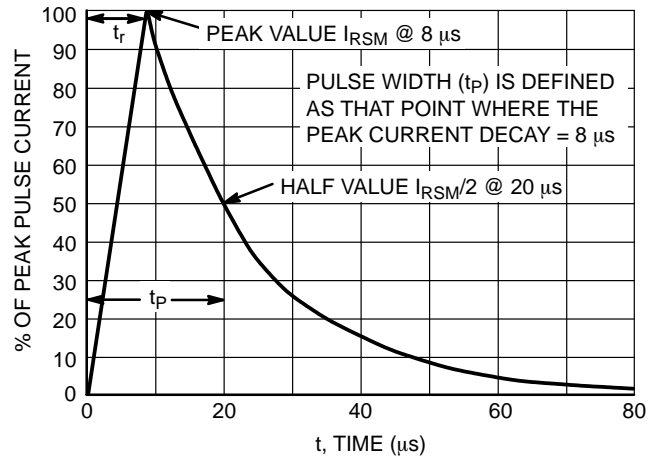


Figure 2. 8 × 20 μs Pulse Waveform

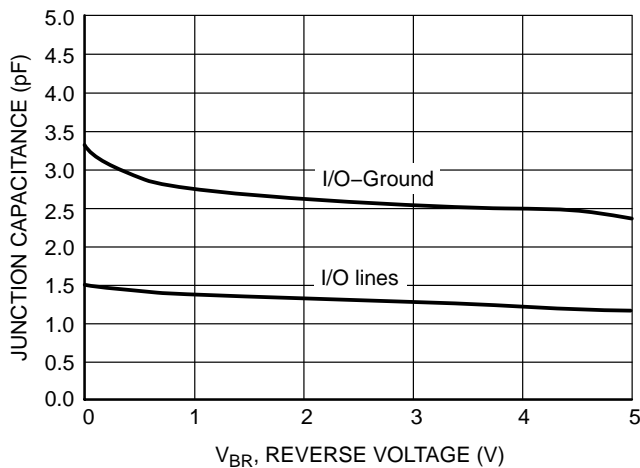


Figure 3. Junction Capacitance vs Reverse Voltage

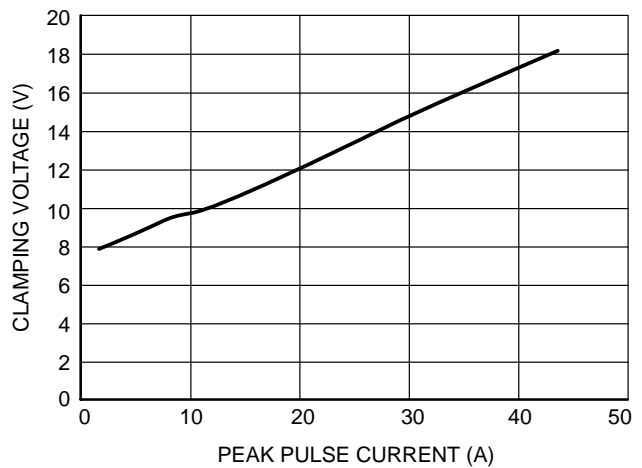
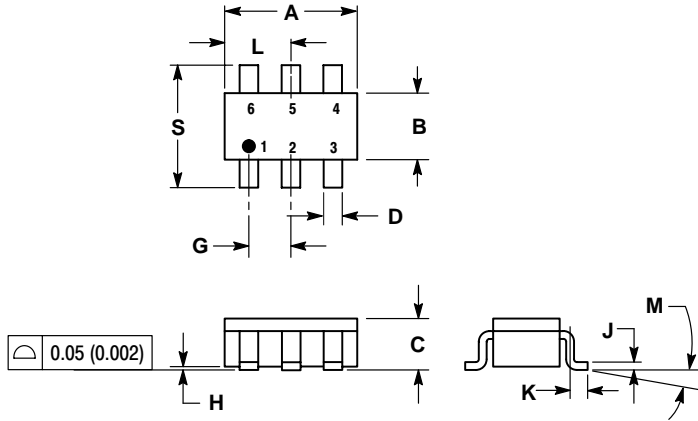


Figure 4. Clamping Voltage vs. Peak Pulse Current (8 x 20 μs Waveform)

NUP2201MR6

PACKAGE DIMENSIONS

TSOP-6
CASE 318G-02
ISSUE K



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

SOLDERING FOOTPRINT*

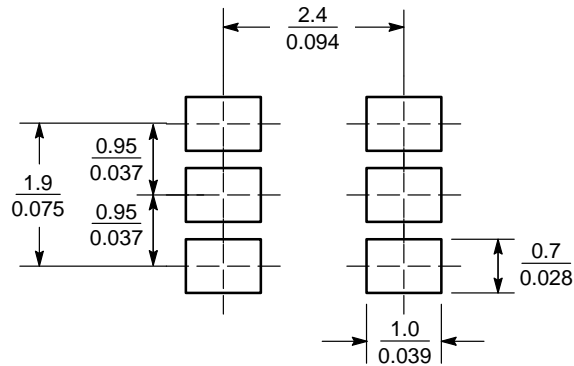


Figure 5. TSOP-6

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

NUP2201MR6

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. This literature is subject to all applicable copyright laws and is not for resale in any manner.

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>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your
local Sales Representative.

NUP2201MR6/D