

# NUP4004M5

## 5-Pin Bi-Directional Quad TVS Array

This 5-Pin bi-directional transient suppressor array is designed for applications requiring transient overvoltage protection capability. It is intended for use in transient voltage and ESD sensitive equipment such as computers, printers, cell phones, medical equipment, and other applications. Its integrated design provides bi-directional protection for four separate lines using a single TSOP-5 package. This device is ideal for situations where board space is a premium.

### Features

- Bi-directional Protection for Four Lines in a Single TSOP-5 Package
- Low Leakage Current
- Low Capacitance
- Provides ESD Protection for JEDEC Standards JESD22
  - Machine Model = Class C
  - Human Body Model = Class 3B
- Provides ESD Protection for IEC 61000-4-2, 15 kV (Air), 8 kV (Contact)
- This is a Pb-Free Device

### Mechanical Characteristics

- Void Free, Transfer-Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications

### Applications

- LCD, Plasma TV Video Lines
- Other Telephone Sets
- Computers / Printers / Set-Top Boxes

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

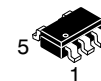
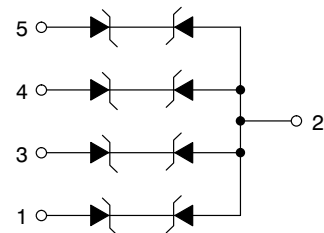
Rating	Symbol	Value	Unit
Operating Junction Temperature Range	T <sub>J</sub>	-40 to 125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Lead Solder Temperature – Maximum (10 sec)	T <sub>L</sub>	260	°C
Human Body Model (HBM)	ESD	16	kV
Machine Model (MM)		0.4	
IEC 61000-4-2 Air (ESD)		30	
IEC 61000-4-2 Contact (ESD)		30	

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



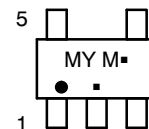
**ON Semiconductor®**

<http://onsemi.com>



TSOP-5  
CASE 483

### MARKING DIAGRAM



MY = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping†
NUP4004M5T1G	TSOP-5 (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.

# NUP4004M5

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Reverse Working Voltage	(Note 1)	V <sub>RWM</sub>			5.0	V
Breakdown Voltage	I <sub>T</sub> = 1 mA, (Note 2)	V <sub>BR</sub>		7.0	8.0	V
Reverse Leakage Current	V <sub>RWM</sub> = 5 V	I <sub>R</sub>		100	1000	nA
Capacitance	V <sub>R</sub> = -3 V, f = 1 MHz (Line to GND)	C <sub>j</sub>		23		pF
Capacitance	V <sub>R</sub> = 3 V, f = 1 MHz (Line to GND)	C <sub>j</sub>		32		pF

1. TVS devices are normally selected according to the working peak reverse voltage (V<sub>RWM</sub>), which should be equal or greater than the DC or continuous peak operating voltage level.
2. V<sub>BR</sub> is measured at pulse test current I<sub>T</sub>.

## TYPICAL PERFORMANCE CURVES

(T<sub>J</sub> = 25°C unless otherwise specified)

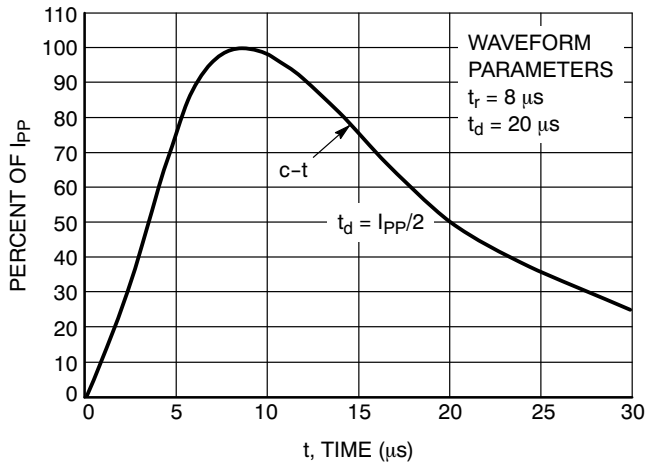


Figure 1. Pulse Waveform

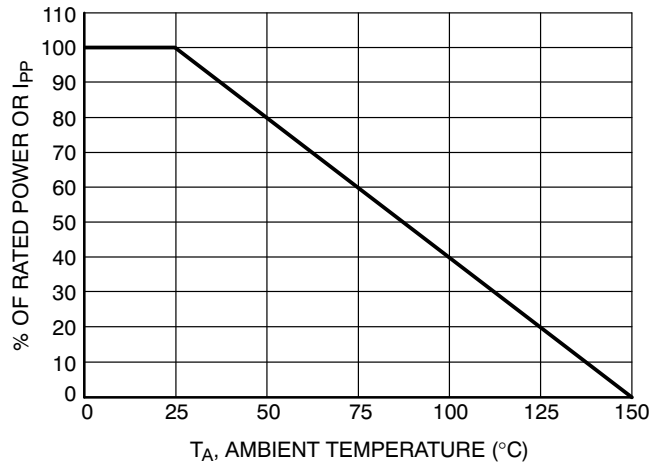
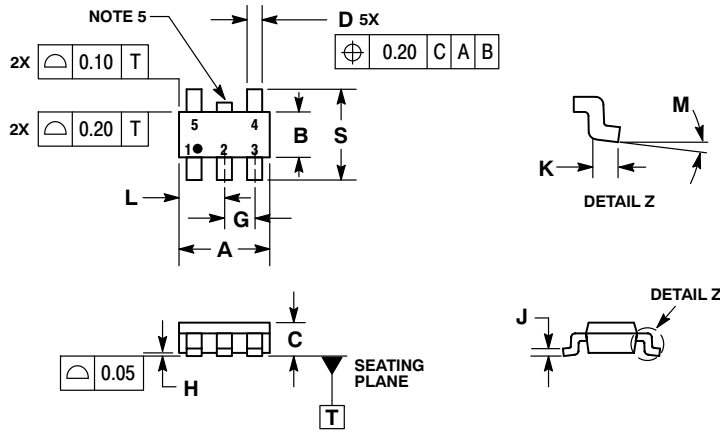


Figure 2. Power Derating Curve

# NUP4004M5

## PACKAGE DIMENSIONS

### TSOP-5 CASE 483-02 ISSUE F

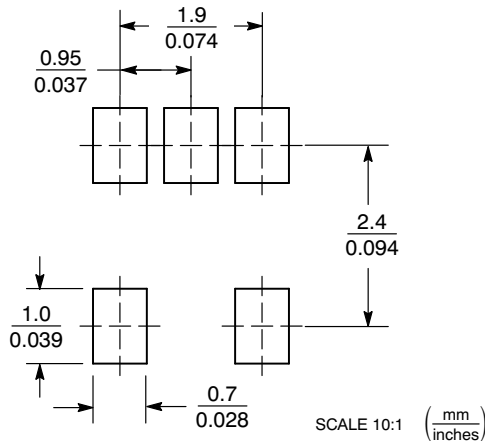


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
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.
5. OPTIONAL CONSTRUCTION: AN ADDITIONAL TRIMMED LEAD IS ALLOWED IN THIS LOCATION. TRIMMED LEAD NOT TO EXTEND MORE THAN 0.2 FROM BODY.

DIM	MILLIMETERS	
	MIN	MAX
A	3.00 BSC	
B	1.50 BSC	
C	0.90	1.10
D	0.25	0.50
G	0.95 BSC	
H	0.01	0.10
J	0.10	0.26
K	0.20	0.60
L	1.25	1.55
M	0°	10°
S	2.50	3.00

### 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.

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  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5773-3850

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

[www.s-manuals.com](http://www.s-manuals.com)