

# NUP4004M5

## ESD Protection Diode Array

### 5-Pin, Bi-Directional, Quad

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

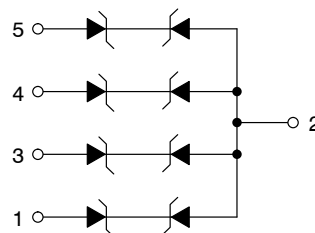
| Rating                                                                                                 | Symbol           | Value                 | Unit               |
|--------------------------------------------------------------------------------------------------------|------------------|-----------------------|--------------------|
| Operating Junction Temperature Range                                                                   | $T_J$            | -40 to 125            | $^{\circ}\text{C}$ |
| Storage Temperature Range                                                                              | $T_{\text{STG}}$ | -55 to 150            | $^{\circ}\text{C}$ |
| Lead Solder Temperature – Maximum (10 sec)                                                             | $T_L$            | 260                   | $^{\circ}\text{C}$ |
| Human Body Model (HBM)<br>Machine Model (MM)<br>IEC 61000-4-2 Air (ESD)<br>IEC 61000-4-2 Contact (ESD) | ESD              | 16<br>0.4<br>30<br>30 | kV                 |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



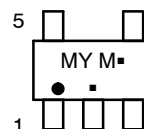
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TSOP-5  
CASE 483

#### 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<br>(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 ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

| Parameter               | Conditions                                                  | Symbol    | Min | Typ | Max  | Unit |
|-------------------------|-------------------------------------------------------------|-----------|-----|-----|------|------|
| Reverse Working Voltage | (Note 1)                                                    | $V_{RWM}$ |     |     | 5.0  | V    |
| Breakdown Voltage       | $I_T = 1 \text{ mA}$ , (Note 2)                             | $V_{BR}$  |     | 7.0 | 8.0  | V    |
| Reverse Leakage Current | $V_{RWM} = 5 \text{ V}$                                     | $I_R$     |     | 100 | 1000 | nA   |
| Capacitance             | $V_R = -3 \text{ V}$ , $f = 1 \text{ MHz}$<br>(Line to GND) | $C_j$     |     | 23  |      | pF   |
| Capacitance             | $V_R = 3 \text{ V}$ , $f = 1 \text{ MHz}$<br>(Line to GND)  | $C_j$     |     | 32  |      | pF   |

1. Surge protection 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.
2.  $V_{BR}$  is measured at pulse test current  $I_T$ .

## TYPICAL PERFORMANCE CURVES

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

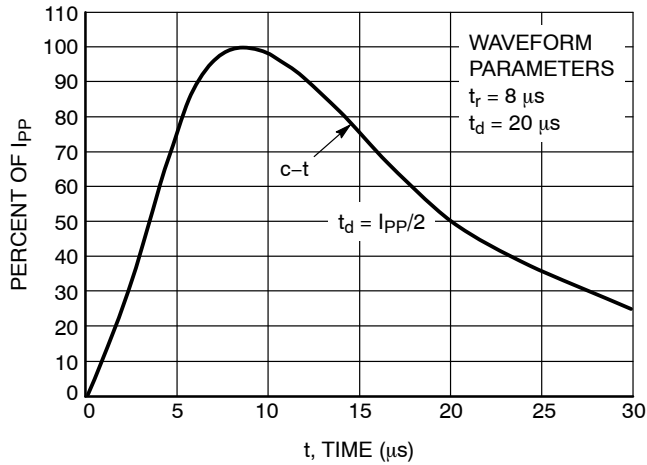


Figure 1. Pulse Waveform

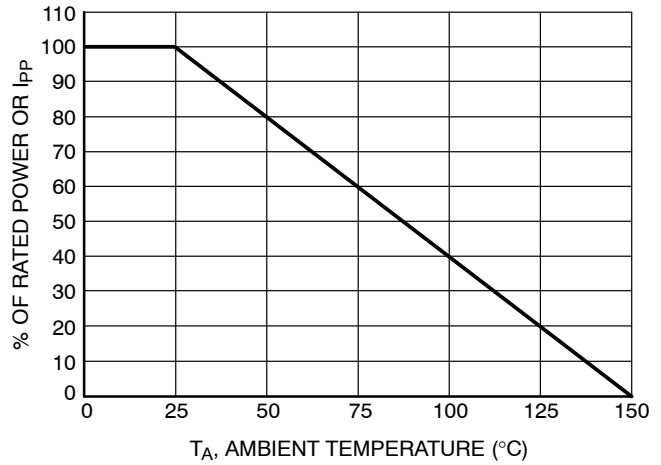
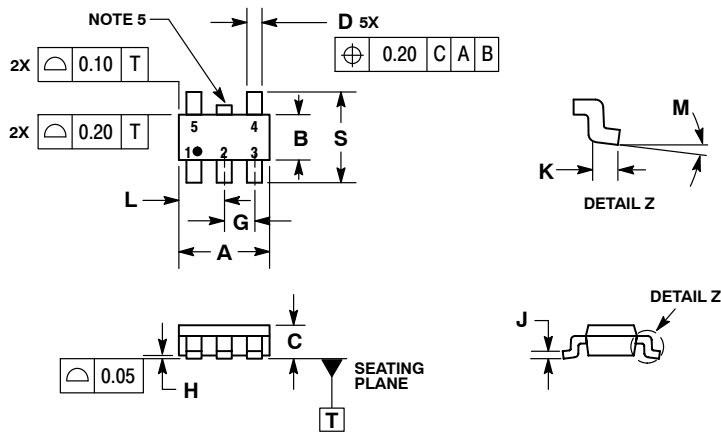


Figure 2. Power Derating Curve

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## PACKAGE DIMENSIONS

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

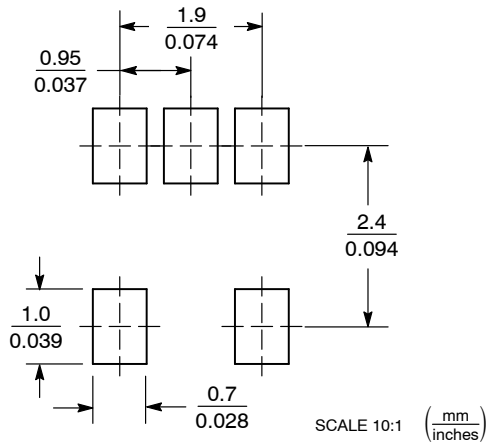


#### NOTES:

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.

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