

# NUP8010MN

## Low Capacitance Transient Voltage Suppressor Array

This integrated transient voltage suppressor device (TVS) is designed for applications requiring transient overvoltage protection. It is intended for use in sensitive equipment such as computers, printers, business machines, communication systems, medical equipment, and other applications. Its integrated design provides very effective and reliable protection for eight separate lines using only one package. These devices are ideal for situations where board space is at a premium.

### Features

- Low Capacitance
- Low Leakage Current < 1  $\mu$ A @ 3 V
- ESD Ratings:
  - ♦ IEC61000-4-2, 8 kV (Contact)
  - ♦ IEC61000-4-2, 15 kV (Air)
  - ♦ Machine Model = Class C, 400 V
  - ♦ Human Body Model = Class 3B, 8 kV
- DFN Package, 1.6 x 1.6 mm
- Moisture Sensitivity Level 1
- This is a Pb-Free Device

### Benefits

- Provides Protection for ESD Industry Standards: IEC 61000, HBM
- Protects the Line Against Transient Voltage Conditions in Either Direction
- Minimize Power Consumption of the System
- Minimize PCB Board Space

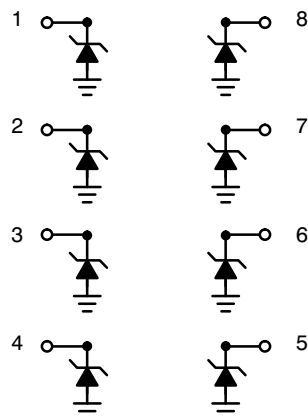
### Applications

- ESD Protection for Data Lines
- Wireless Phones
- Handheld Products
- Notebook Computers
- LCD Displays

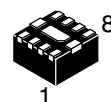


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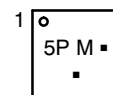


(Top View)



DFN8  
CASE 506AK

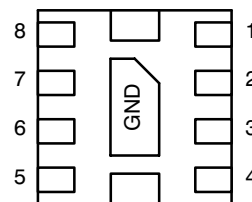
### MARKING DIAGRAM



5P = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

(Note: Microdot may be in either location)

### PIN CONNECTIONS



(Bottom View)

### ORDERING INFORMATION

| Device       | Package           | Shipping           |
|--------------|-------------------|--------------------|
| NUP8010MNT1G | DFN8<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 Specifications Brochure, BRD8011/D.

# NUP8010MN

## MAXIMUM RATINGS

| Parameter                                                                         | Symbol               | Value      | Unit             |
|-----------------------------------------------------------------------------------|----------------------|------------|------------------|
| ESD Discharge IEC61000-4-2<br>Air Discharge<br>Contact Discharge                  | $V_{PP}$             | 15<br>8.0  | kV               |
| Peak Power Dissipation (8 x 20 $\mu$ S @ $T_A = 25^\circ\text{C}$ )               | $P_{pk}$<br>(Note 1) | 20         | W                |
| Operating Temperature Range                                                       | $T_{OP}$             | -40 to 85  | $^\circ\text{C}$ |
| Storage Temperature Range                                                         | $T_{STG}$            | -55 to 150 | $^\circ\text{C}$ |
| Maximum Lead Temperature for Soldering Purposes (1.8 in from case for 10 seconds) | $T_L$                | 260        | $^\circ\text{C}$ |

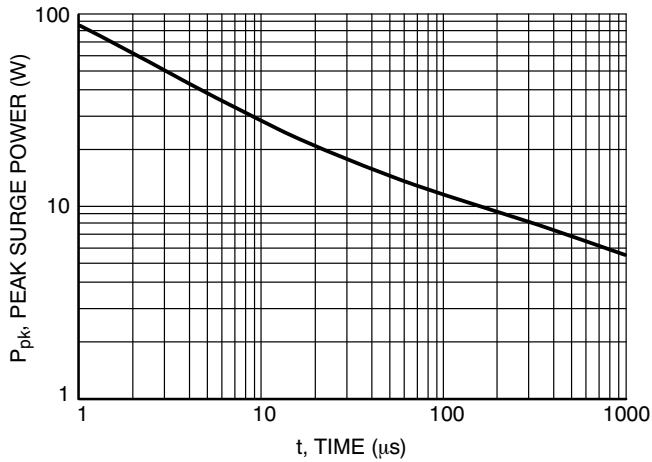
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Nonrepetitive current per Figure 4.

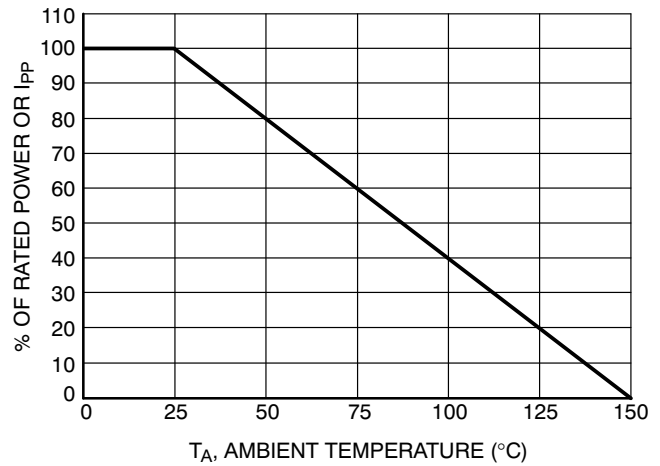
## ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                       | Symbol    | Test Conditions                          | Min | Typ  | Max  | Unit          |
|---------------------------------|-----------|------------------------------------------|-----|------|------|---------------|
| Maximum Reverse Working Voltage | $V_{RWM}$ |                                          |     |      | 3.0  | V             |
| Breakdown Voltage               | $V_{BR}$  | $I_R = 1.0 \text{ mA}$                   | 5.3 | 5.6  | 5.9  | V             |
| Leakage Current                 | $I_R$     | $V_{RWM} = 3.3 \text{ V}$                |     | 0.01 | 1.0  | $\mu\text{A}$ |
| Clamping Voltage                | $V_C$     | $I_{PP} = 1.6 \text{ A}$                 |     |      | 13   | V             |
| Capacitance                     | $C_d$     | $f = 1 \text{ MHz}, V_R = 0 \text{ V}$   |     | 13   | 17   | pF            |
| Capacitance                     | $C_d$     | $f = 1 \text{ MHz}, V_R = 3.0 \text{ V}$ |     | 7.0  | 11.5 | pF            |

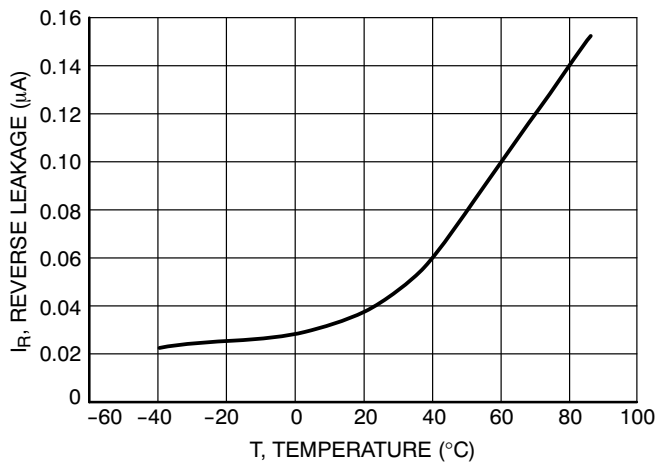
**TYPICAL PERFORMANCE CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)



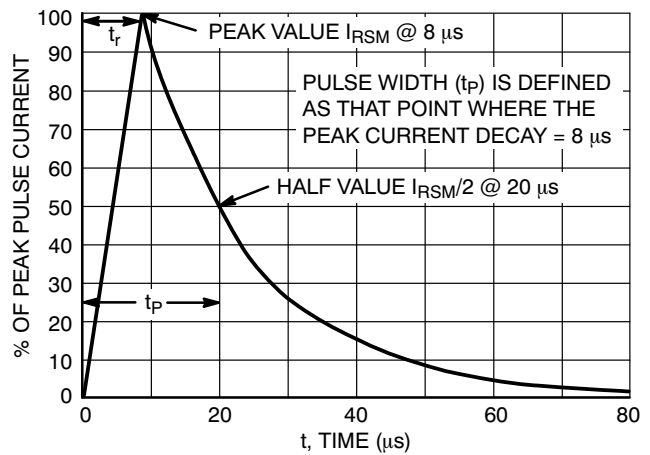
**Figure 1. Pulse Width**



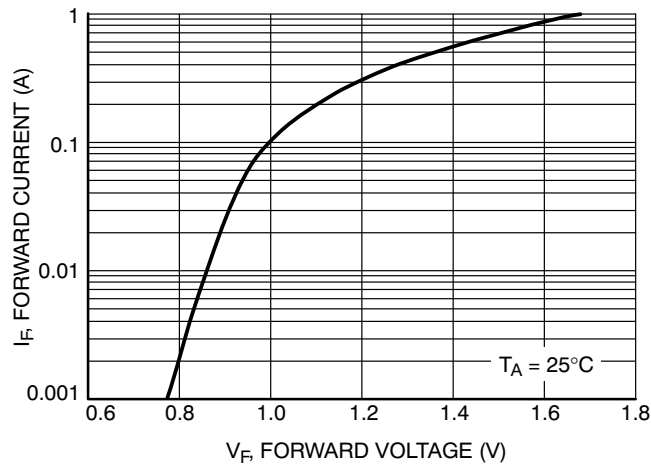
**Figure 2. Power Derating Curve**



**Figure 3. Reverse Leakage versus Temperature**



**Figure 4.  $8 \times 20 \mu\text{s}$  Pulse Waveform**



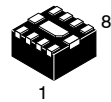
**Figure 5. Forward Voltage**

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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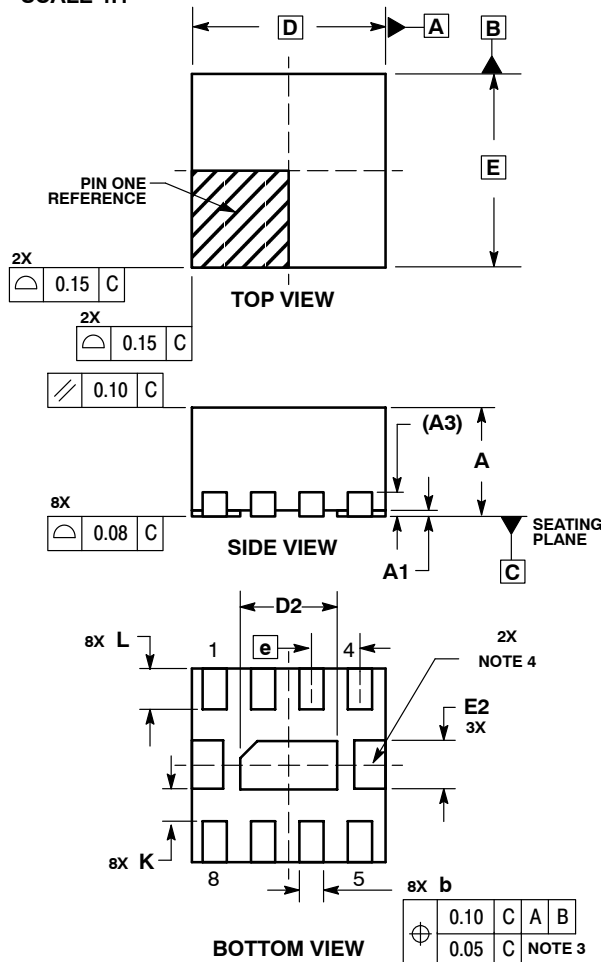
ON



SCALE 4:1

DFN8  
CASE 506AK-01  
ISSUE C

DATE 30 SEP 2005

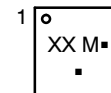


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
4. EXPOSED PADS CONNECTED TO DIE FLAG. USED AS TEST CONTACTS.

| MILLIMETERS |      |      |
|-------------|------|------|
| DIM         | MIN  | MAX  |
| A           | 0.80 | 1.00 |
| A1          | 0.00 | 0.05 |
| A3          | 0.20 | REF  |
| b           | 0.15 | 0.25 |
| D           | 1.60 | BSC  |
| D2          | 0.70 | 0.90 |
| E           | 1.60 | BSC  |
| E2          | 0.30 | 0.50 |
| e           | 0.40 | BSC  |
| K           | 0.20 | ---  |
| L           | 0.20 | 0.40 |

### GENERIC MARKING DIAGRAM\*

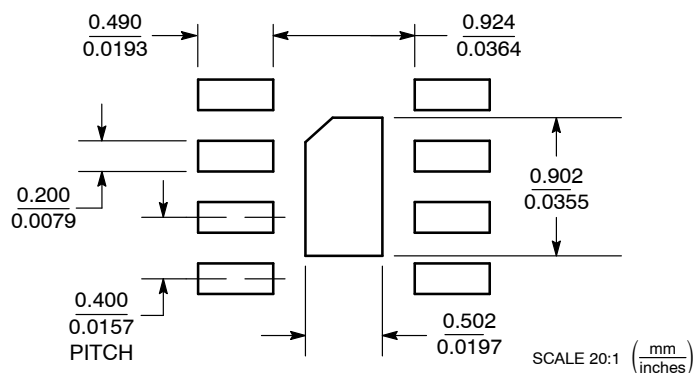


X = Specific Device Code  
M = Date Code  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking.

Pb-Free indicator, "G" or microdot "■", may or may not be present.

### 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.

|                  |                                   |                                                                                                                                                                                     |
|------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOCUMENT NUMBER: | 98AON20130D                       | Electronic versions are uncontrolled except when accessed directly from the Document Repository.<br>Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| DESCRIPTION:     | DFN8 1.6*1.6 MM 0.4 MM LEAD PITCH | PAGE 1 OF 1                                                                                                                                                                         |

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