

# NUP8011MU

## 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, 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 @ 4.3 V
- ESD Ratings:
  - ♦ IEC61000-4-2, 8 kV (Contact)
  - ♦ Machine Model = Class C, 400 V
  - ♦ Human Body Model = Class 3B, 8 kV
- UDFN Package, 1.2 x 1.8 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
- Minimize Power Consumption of the System
- Minimize PCB Board Space

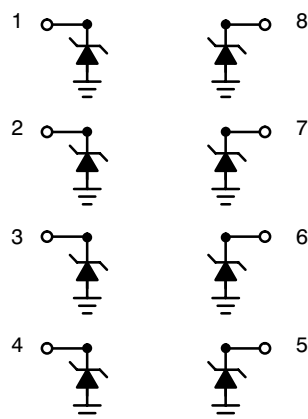
### Applications

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

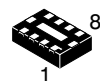


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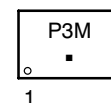


(Top View)



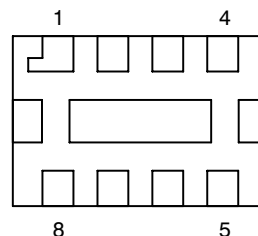
**UDFN8  
CASE 517AD**

### MARKING DIAGRAM



P3 = Specific Device Code  
M = Month Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### PIN CONNECTIONS



### ORDERING INFORMATION

| Device       | Package            | Shipping           |
|--------------|--------------------|--------------------|
| NUP8011MUTAG | UDFN8<br>(Pb-Free) | 3000 / Tape & Reel |

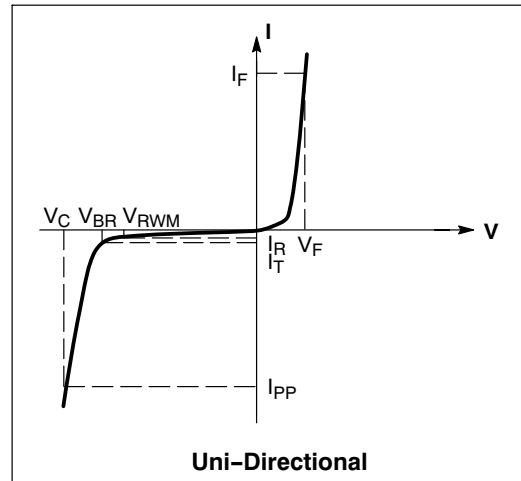
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# NUP8011MU

## ELECTRICAL CHARACTERISTICS

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

| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $V_{RWM}$ | Working Peak Reverse Voltage                |
| $I_R$     | Maximum Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_T$     | Test Current                                |
| $I_F$     | Forward Current                             |
| $V_F$     | Forward Voltage @ $I_F$                     |



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

| Characteristic                                                               | Symbol          | Value       | Unit                                             |
|------------------------------------------------------------------------------|-----------------|-------------|--------------------------------------------------|
| Steady State Power – 1 Diode (Note 1)                                        | $P_D$           | 380         | mW                                               |
| Thermal Resistance, Junction-to-Ambient<br>Above $25^\circ\text{C}$ , Derate | $R_{\theta JA}$ | 327<br>3.05 | $^\circ\text{C/W}$<br>$\text{mW}/^\circ\text{C}$ |
| Maximum Junction Temperature                                                 | $T_{Jmax}$      | 150         | $^\circ\text{C}$                                 |
| Operating Temperature Range                                                  | $T_{OP}$        | -40 to +85  | $^\circ\text{C}$                                 |
| Storage Temperature Range                                                    | $T_{stg}$       | -55 to +150 | $^\circ\text{C}$                                 |
| Lead Solder Temperature (10 seconds duration)                                | $T_L$           | 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.

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Device       | Device Marking | Breakdown Voltage<br>$V_{BR}$ @ 1 mA (Volts) |     |      | Leakage Current<br>$I_{RM}$ @ $V_{RM}$ |                             | Typ Capacitance<br>@ 0 V Bias (pF)<br>(Note 2) |     | Typ Capacitance<br>@ 3 V Bias (pF)<br>(Note 2) |     |
|--------------|----------------|----------------------------------------------|-----|------|----------------------------------------|-----------------------------|------------------------------------------------|-----|------------------------------------------------|-----|
|              |                | Min                                          | Nom | Max  | $V_{RWM}$                              | $I_{RWM}$ ( $\mu\text{A}$ ) | Typ                                            | Max | Typ                                            | Max |
| NUP8011MUTAG | P3             | 6.47                                         | 6.8 | 7.14 | 4.3                                    | 1.0                         | 12                                             | 14  | 6.7                                            | 9.5 |

- Only 1 diode under power. For all 4 diodes under power,  $P_D$  will be 25%. Mounted on FR-4 board with min pad.
- Capacitance of one diode at  $f = 1 \text{ MHz}$ ,  $V_R = 0 \text{ V}$ ,  $T_A = 25^\circ\text{C}$

TYPICAL ELECTRICAL CHARACTERISTICS

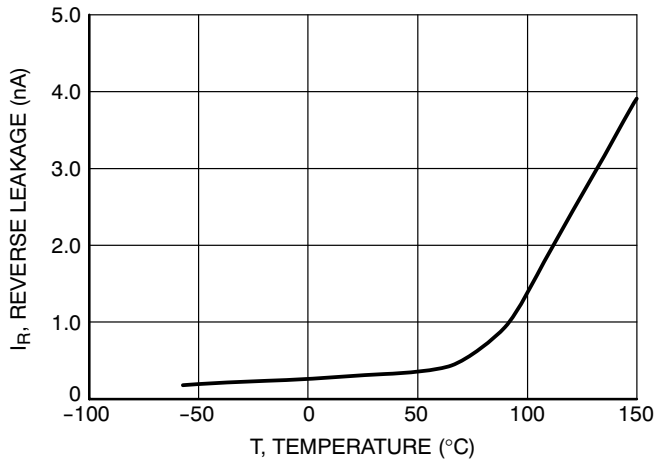


Figure 1. Reverse Leakage versus Temperature

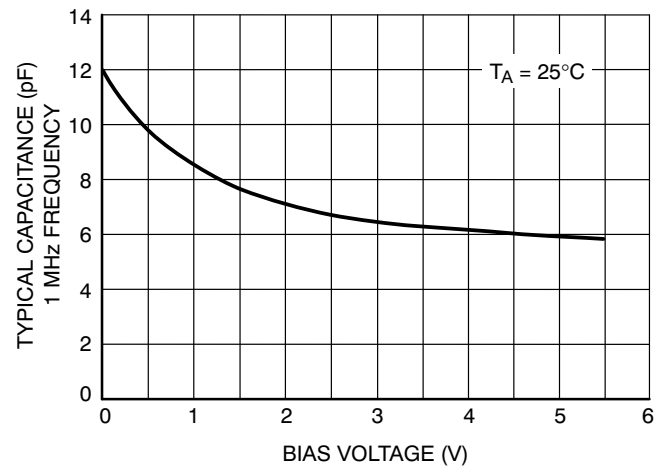


Figure 2. Capacitance

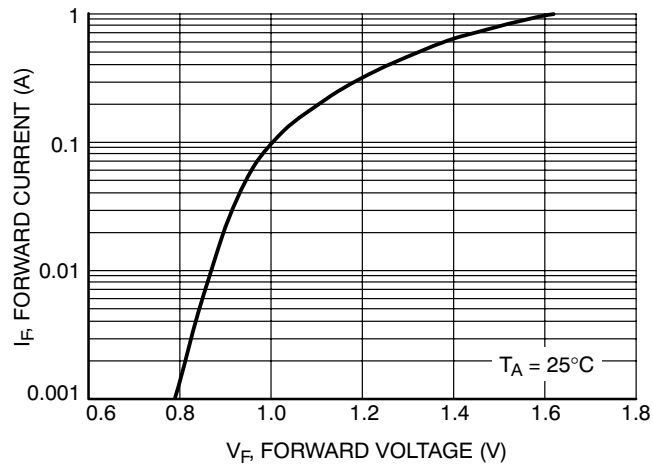
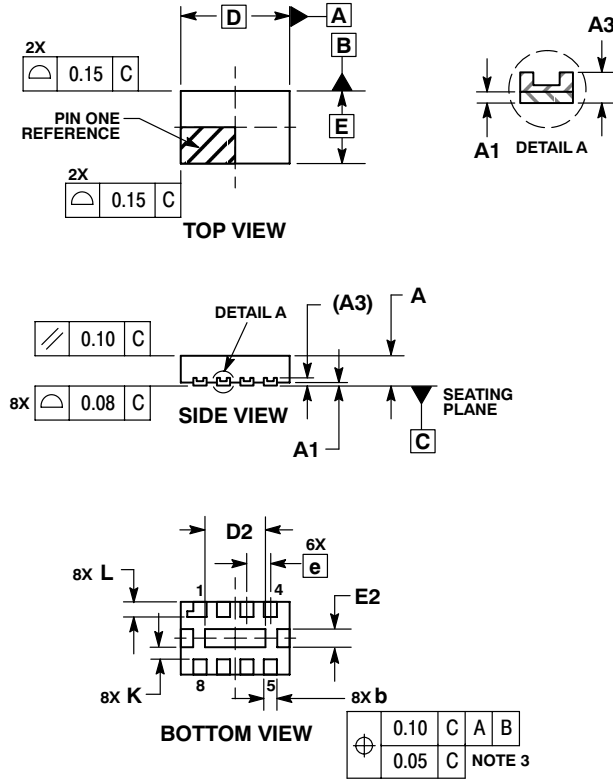


Figure 3. Forward Voltage

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## PACKAGE DIMENSIONS

UDFN8, 1.8x1.2, 0.4P  
CASE 517AD-01  
ISSUE O



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 mm FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN         | NOM  | MAX  |
| A   | 0.45        | 0.50 | 0.55 |
| A1  | 0.00        | 0.03 | 0.05 |
| A3  | 0.127 REF   |      |      |
| b   | 0.15        | 0.20 | 0.25 |
| D   | 1.80 BSC    |      |      |
| D2  | 0.90        | 1.00 | 1.10 |
| E   | 1.20 BSC    |      |      |
| E2  | 0.20        | 0.30 | 0.40 |
| e   | 0.40 BSC    |      |      |
| K   | 0.20        | ---  | ---  |
| L   | 0.20        | 0.25 | 0.30 |

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