

NUP4012PMU

ESD Protection Diode Array Quad, Ultra-Low Capacitance

The four-line surge protection array is designed to protect voltage-sensitive components that require ultra-low capacitance from ESD and transient voltage events. This device features a common anode design which protects four independent high speed data lines in a single six-lead UDFN low profile package.

Excellent clamping capability, low capacitance, low leakage, and fast response time make these parts ideal for ESD protection on designs where board space is at a premium. Because of its low capacitance, it is suited for use in high frequency designs.

Features

- Low Capacitance Data Lines (0.7 pF Typical)
- Protects up to Four Data Lines
- UDFN Package, 1.6 x 1.6 mm
- Low Profile of 0.50 mm for Ultra Slim Design
- ESD Rating: IEC61000-4-2: Level 4
– Contact (14 kV)
- D₁, D₂, D₃ and D₄ Pins = 5.2 V Minimum Protection
- RoHS Compliant
- This is a Pb-Free Device

Typical Applications

- USB 2.0 High-Speed Interface
- Cell Phones
- MP3 Players
- SIM Card Protection

MAXIMUM RATINGS (T_J = 25°C, unless otherwise specified)

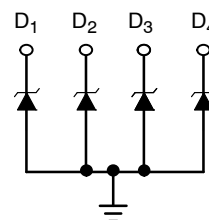
| Symbol | Rating | Value | Unit |
|------------------|---|------------|------|
| T _J | Operating Junction Temperature Range | -40 to 125 | °C |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _L | Lead Solder Temperature – Maximum (10 seconds) | 260 | °C |
| ESD | IEC 61000-4-2 Contact | 14000 | V |

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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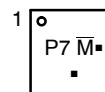
www.onsemi.com



MARKING DIAGRAM



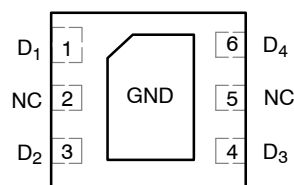
UDFN6 1.6x1.6
MU SUFFIX
CASE 517AP



- P7 = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

PIN CONNECTIONS



ORDERING INFORMATION

| Device | Package | Shipping† |
|---------------|--------------------|------------------|
| NUP4012PMUTAG | UDFN6 (Pb-Free) | 3000/Tape & Reel |

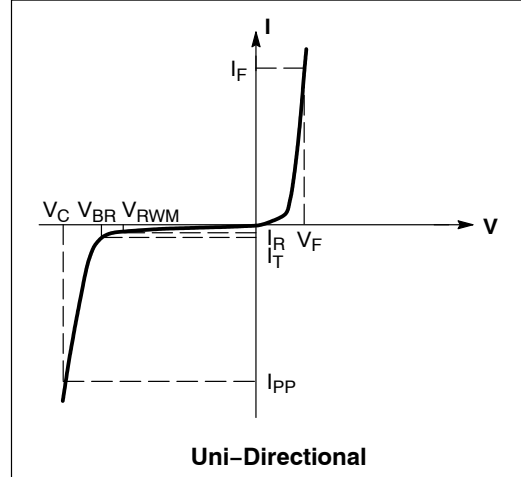
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS

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

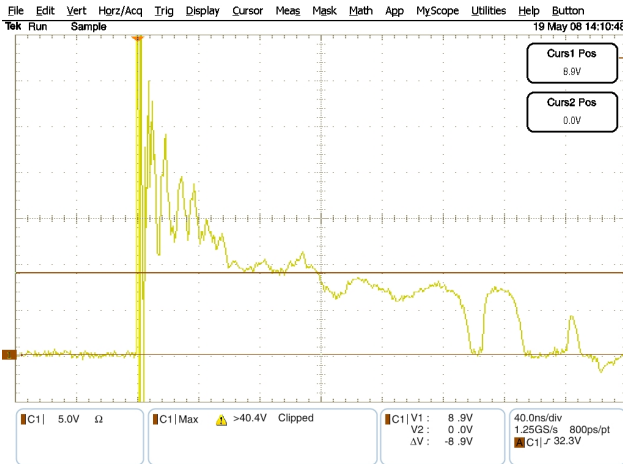
| Symbol | Parameter |
|-----------|--|
| I_{PP} | Maximum Reverse Peak Pulse Current |
| V_C | Clamping Voltage @ I_{PP} |
| V_{RWM} | Working Peak Reverse Voltage |
| I_R | Maximum Reverse Leakage Current @ V_{RWM} |
| V_{BR} | Breakdown Voltage @ I_T |
| I_T | Test Current |
| I_F | Forward Current |
| V_F | Forward Voltage @ I_F |
| P_{pk} | Peak Power Dissipation |
| C | Max. Capacitance @ $V_R = 0$ and $f = 1.0$ MHz |



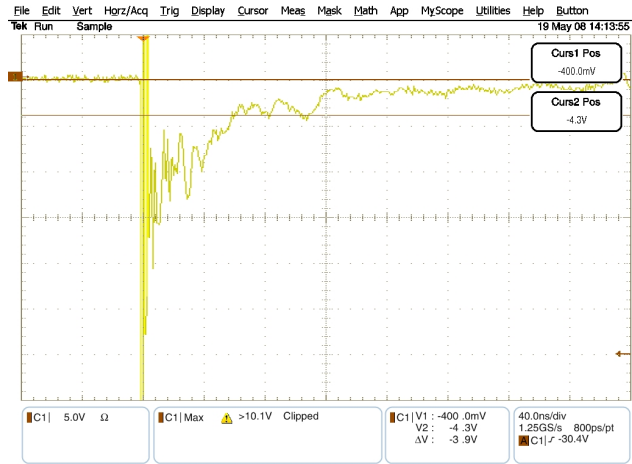
ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|--|--|-----------|-----|-----|-----|---------------|
| Reverse Working Voltage (D ₁ , D ₂ , D ₃ and D ₄) | (Note 1) | V_{RWM} | - | - | 4.0 | V |
| Breakdown Voltage (D ₁ , D ₂ , D ₃ and D ₄) | $I_T = 1$ mA, (Note 2) | V_{BR} | 5.2 | 5.5 | - | V |
| Reverse Leakage Current (D ₁ , D ₂ , D ₃ and D ₄) | @ V_{RWM} | I_R | - | - | 1.0 | μA |
| Capacitance (D ₁ , D ₂ , D ₃ and D ₄) | $V_R = 0$ V, $f = 1$ MHz (Line to GND) | C_J | - | 0.7 | 0.9 | pF |

- 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.
- V_{BR} is measured at pulse test current I_T .



**Figure 1. ESD Clamping Voltage Screenshot
Positive 8 kV Contact per IEC61000-4-2**

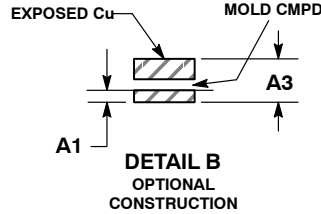
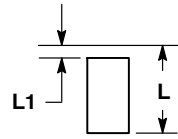
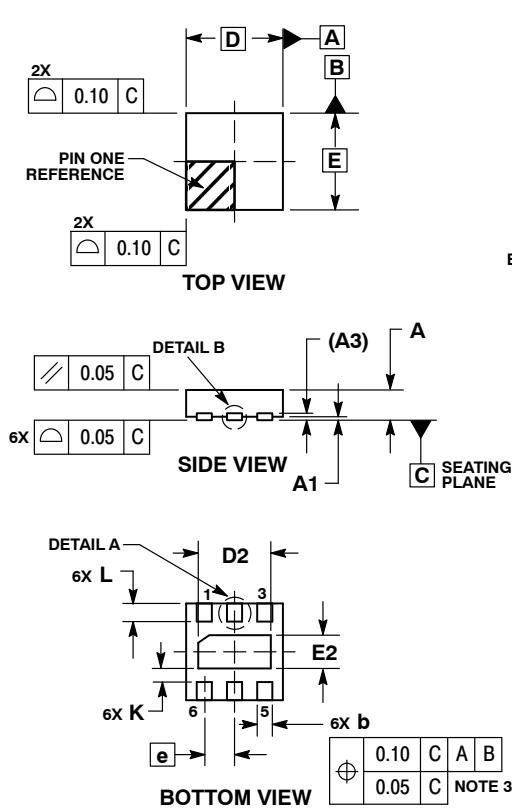


**Figure 2. ESD Clamping Voltage Screenshot
Negative 8 kV Contact per IEC61000-4-2**

NUP4012PMU

PACKAGE DIMENSIONS

UDFN6, 1.6 x 1.6, 0.5P
CASE 517AP-01
ISSUE O

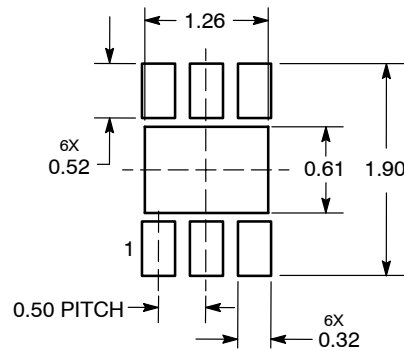


NOTES:

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 0.30 mm FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| MILLIMETERS | | |
|-------------|------|------|
| DIM | MIN | MAX |
| A | 0.45 | 0.55 |
| A1 | 0.00 | 0.05 |
| A3 | 0.13 | REF |
| b | 0.20 | 0.30 |
| D | 1.60 | BSC |
| E | 1.60 | BSC |
| e | 0.50 | BSC |
| D2 | 1.10 | 1.30 |
| E2 | 0.45 | 0.65 |
| K | 0.20 | --- |
| L | 0.20 | 0.40 |
| L1 | 0.00 | 0.15 |

SOLDERMASK DEFINED MOUNTING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*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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