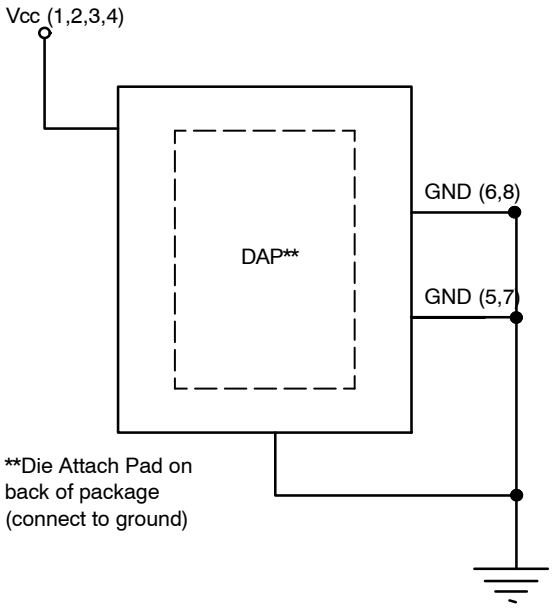
# NSPU5132

# 13.5 V Unidirectional ESD and Surge Protection Device

**Features**

- Unidirectional High Voltage ESD & Surge Protection Device
- Provides ESD Protection to IEC61000−4−2 Level 4: ±30 kV Contact Discharge
- Small Package (1.8 mm x 2.0 mm)
- High Voltage Zener Diode Protects Supply Rail up to 200 A (8/20 μs)
- These Devices are Pb−Free and are RoHS Compliant

**APPLICATION DIAGRAM**




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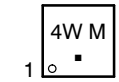


**UDFN6**
**D4 SUFFIX**
**CASE 517CS**

**BLOCK DIAGRAM**




**MARKING DIAGRAM**




4W = Specific Device Code
M = Date Code
▪ = Pb−Free Package

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| NSPU5132MUTBG | UDFN6 (Pb−Free) | 3000 / Tape & Reel |

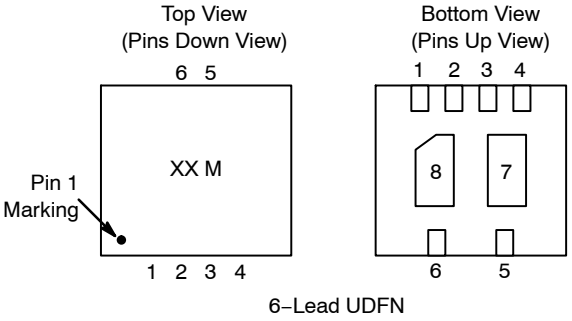
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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### Table 1. PIN DESCRIPTIONS

| 6−Lead, UDFN−8 Package | | |
|---|---|---|
| **Pin** | **Name** | **Description** |
| 1 | $V_{CC}$ | Cathode |
| 2 | $V_{CC}$ | Cathode |
| 3 | $V_{CC}$ | Cathode |
| 4 | $V_{CC}$ | Cathode |
| 5 | GND | Anode |
| 6 | GND | Anode |
| 7 | GND | Anode |
| 8 | GND | Anode |

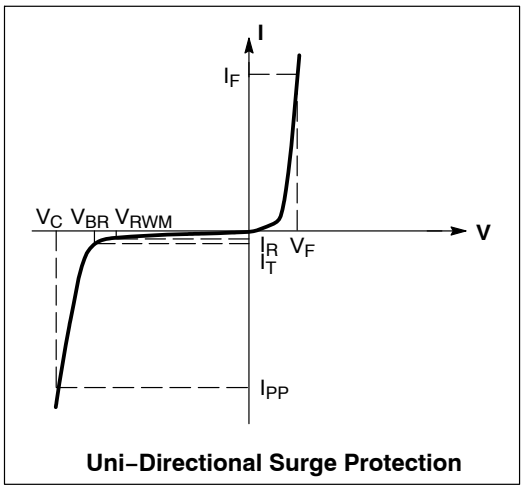
### PACKAGE / PINOUT DIAGRAMS




6−Lead UDFN

### ELECTRICAL CHARACTERISTICS

| 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 |
| $\Theta V_{BR}$ | Maximum Temperature Coefficient of $V_{BR}$ |
| $I_F$ | Forward Current |
| $V_F$ | Forward Voltage @ $I_F$ |




**Uni−Directional Surge Protection**

## SPECIFICATIONS

### Table 2. ABSOLUTE MAXIMUM RATINGS

| Parameter | Rating | Units |
|---|---|---|
| Operating Temperature Range | −55 to +125 | °C |
| Storage Temperature Range | −65 to +150 | °C |
| Peak Current ($t_p$ = 8/20 μs) | 200 | A |
| Peak Pulse Power ($t_p$ = 8/20 μs) | 4800 | W |

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.

### ELECTRICAL CHARACTERISTICS

| Device Name | Device Marking | $V_{RWM}$ (V) (Note 1) | $I_R$ @ $V_{RWM}$ (μA) | Breakdown Voltage | | | | $V_C$ @ $I_{PP}$ (8 x 20 μs) (Note 3) | | Junction Capacitance ($V_R$ = 0 V, f = 1 MHz, Pin 1 to Pin 5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $V_{BR}$ V (Note 2) | | | @ $I_T$ (mA) | $V_C$ (V) | $I_{PP}$ (A) | $C_J$ (pF) | |
| | | Max | Max | Min | Nom | Max | | Max | | Typ | Max |
| NSPU5132 | 4W | 13.5 | 0.5 | 13.6 | 15.5 | 17.5 | 1 | 24 | 200 | 1325 | 1550 |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. A surge protector is normally selected according to the working peak reverse voltage ($V_{RWM}$), which should be equal to or greater than the DC or continuous peak operating voltage level.
2. $V_{BR}$ measured at pulse test current $I_T$ at an ambient temperature of 25°C.
3. Surge current waveform per Figure 1.

## TYPICAL CHARACTERISTICS

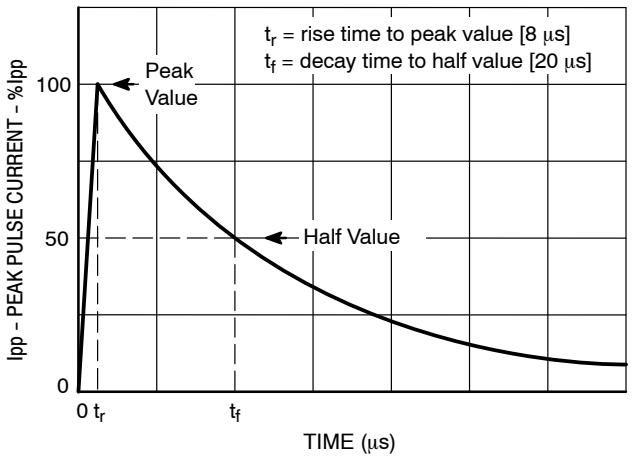



**Figure 1. IEC61000−4−5 8/20 μs Pulse Waveform**

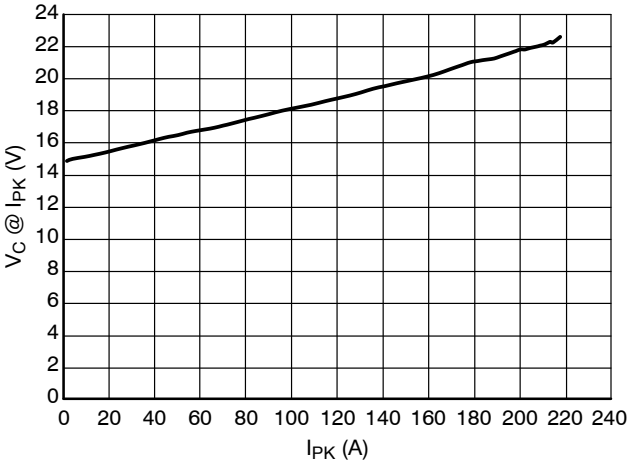
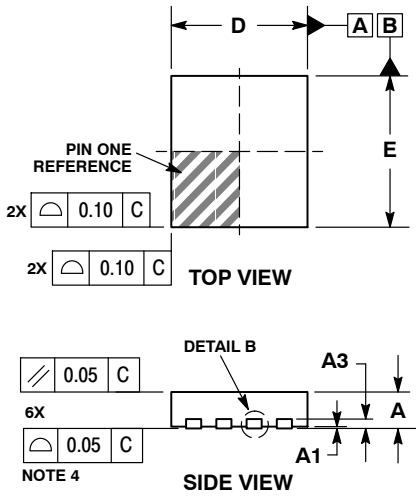
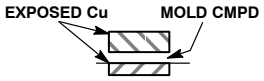



**Figure 2. Positive Clamping Voltage vs. Peak Pulse Current**

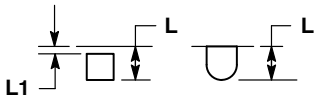
## PACKAGE DIMENSIONS

**UDFN6, 1.8x2, 0.4P**
CASE 517CS
ISSUE O



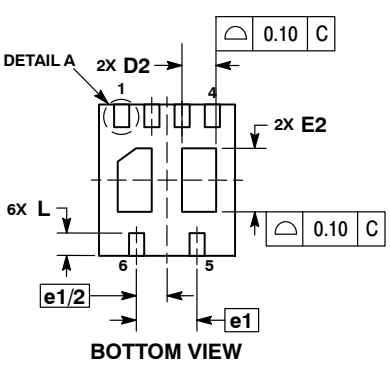

**DETAIL B**
**ALTERNATE CONSTRUCTION**



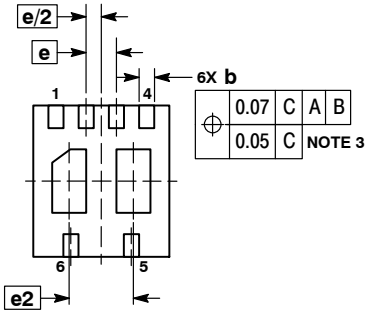

**DETAIL A**
**ALTERNATE CONSTRUCTIONS**

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINALS AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.
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 | 0.125 REF | |
| b | 0.15 | 0.25 |
| D | 1.80 BSC | |
| D2 | 0.35 | 0.55 |
| E | 2.00 BSC | |
| E2 | 0.74 | 0.94 |
| e | 0.40 BSC | |
| e1 | 0.80 BSC | |
| e2 | 0.95 BSC | |
| L | 0.20 | 0.40 |
| L1 | --- | 0.15 |

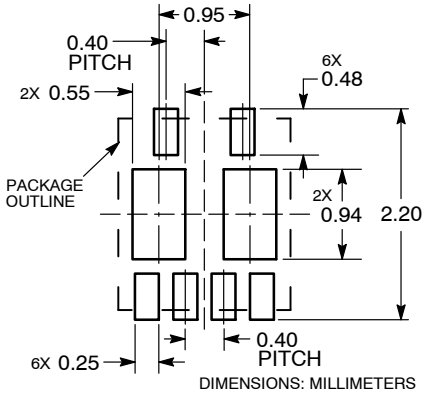



**BOTTOM VIEW**




**SUPPLEMENTAL BOTTOM VIEW**

**RECOMMENDED 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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