

15 V and 18 V Unidirectional ESD and Surge Protection Device

NSPM8151, NSPM8181

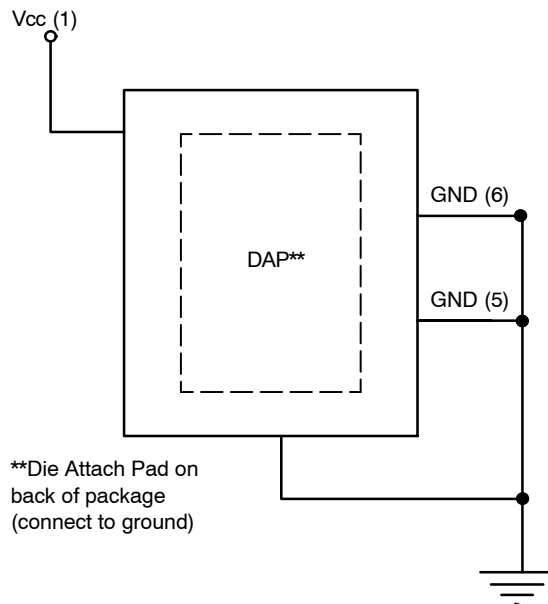


UDFN6
D4 SUFFIX
CASE 517CS

Features

- Unidirectional High Voltage ESD & Surge Protection Device
- Provides ESD Protection to IEC61000-4-2 Level 4: ±30 kV Contact Discharge
- IEC 61000-4-5 (lighting)
- High Voltage Zener Diode Protects Supply Rail up to 100 A (8/20 μs)
- These Devices are Pb-Free and are RoHS Compliant

APPLICATION DIAGRAM



BLOCK DIAGRAM



MARKING DIAGRAM



- Ax = Specific Device Code
x = 5 or E
- M = Date Code
- = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|---------------|-----------------|-----------------------|
| NSPM8151MUTBG | UDFN6 (Pb-Free) | 3,000 / Tape & Reel |
| NSPM8181MUTBG | UDFN6 (Pb-Free) | 3,000 / Tape & Reel |

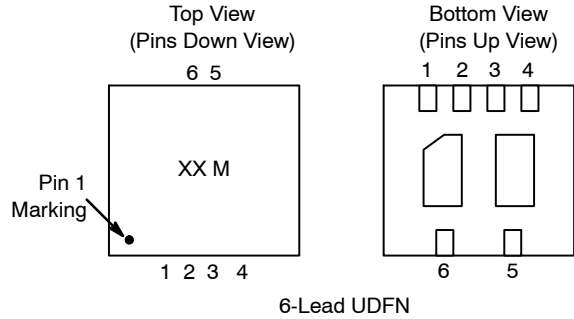
[†] For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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Table 1. PIN DESCRIPTIONS

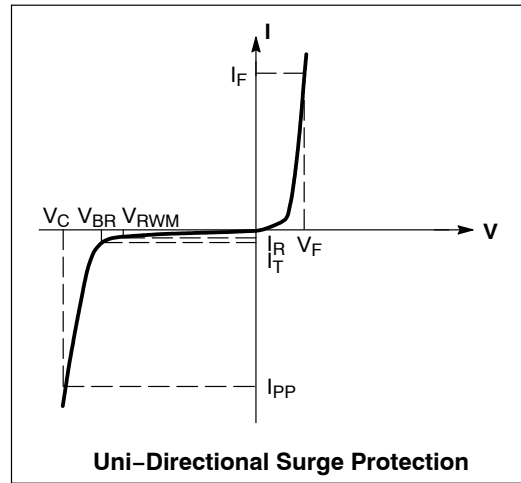
| 4-Channel, 6-Lead, UDFN-8 Package | | | |
|-----------------------------------|-----------------|--------------------|----------------|
| Pin | Name | Type | Description |
| 1 | V _{CC} | HV V _{DD} | HV ESD Channel |
| 2 | N/C | | No Connect |
| 3 | N/C | | No Connect |
| 4 | N/C | | No Connect |
| 5 | GND | | Ground |
| 6 | GND | | Ground |

PACKAGE / PINOUT DIAGRAMS



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 |
| ∅V _{BR} | Maximum Temperature Coefficient of V _{BR} |
| I _F | Forward Current |
| V _F | Forward Voltage @ I _F |



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) | NSPM8151: 100 NSPM8181: 119 | A |

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) Max | I _R @ V _{RWM} (μA) Max | Breakdown Voltage | | | | V _C @ I _{PP} (8 x 20 μs) (Note 3) | |
|-------------|----------------|---|---|----------------------------|------|------|-----------------------|--|---------------------|
| | | | | V _{BR} V (Note 2) | | | @ I _T (mA) | V _C (V) | I _{PP} (A) |
| | | | | Min | Nom | Max | | Max | |
| NSPM8151 | A5 | 15 | 1 | 16 | 17.5 | 18.5 | 1 | 27 | 100 |
| NSPM8181 | A8 | 18 | 1 | 20 | 22.5 | 23.5 | 1 | 28 30 | 70 100 |

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.

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TYPICAL CHARACTERISTICS

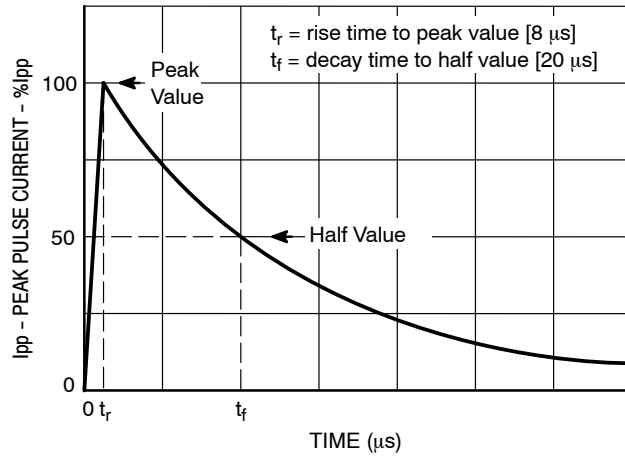


Figure 1. IEC61000-4-5 8/20 μ s Pulse Waveform

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REVISION HISTORY

| Revision | Description of Changes | Date |
|----------|---|-----------|
| 2 | Rebranded the Data Sheet to onsemi format. | 10/6/2025 |

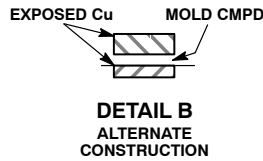
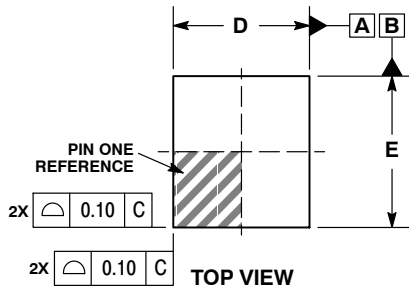
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



SCALE 4:1

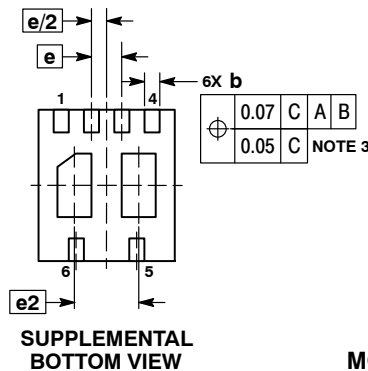
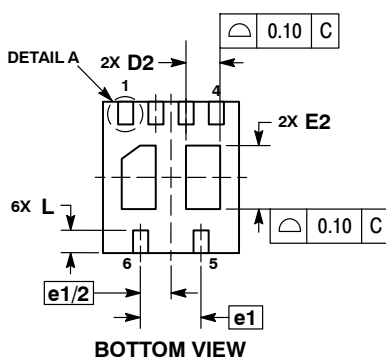
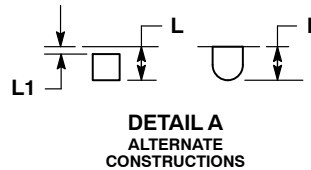
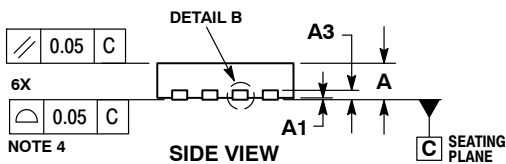
UDFN6, 1.8x2, 0.4P
CASE 517CS
ISSUE O

DATE 30 APR 2013



- 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.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | 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 |



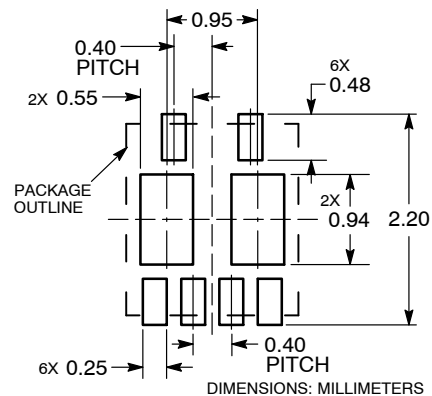
GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code

*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.

RECOMMENDED MOUNTING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

| | | |
|------------------|-------------------|--|
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| DESCRIPTION: | UDFN6 1.8X2, 0.4P | PAGE 1 OF 1 |

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