

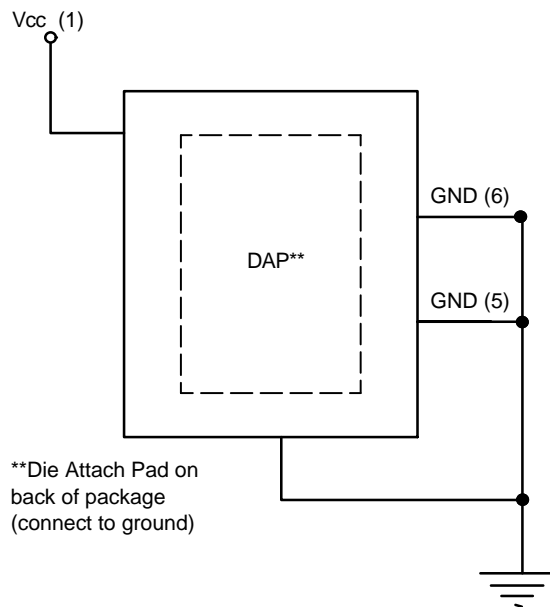
# NSPM8151, NSPM8181

## 15 V and 18 V Unidirectional ESD and Surge Protection Device

### Features

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

### APPLICATION DIAGRAM



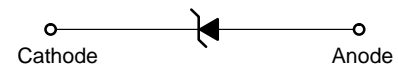
ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)



UDFN6  
D4 SUFFIX  
CASE 517CS

### 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)	3000 / Tape & Reel
NSPM8181MUTBG	UDFN6 (Pb-Free)	3000 / Tape & Reel

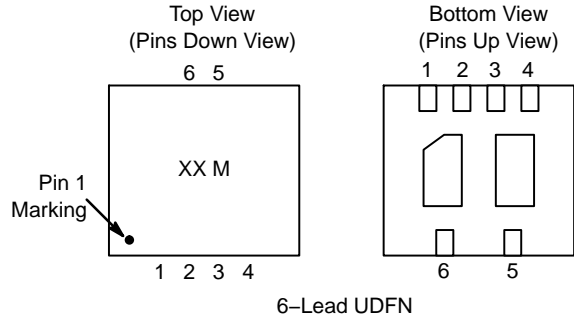
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

# NSPM8151, NSPM8181

**Table 1. PIN DESCRIPTIONS**

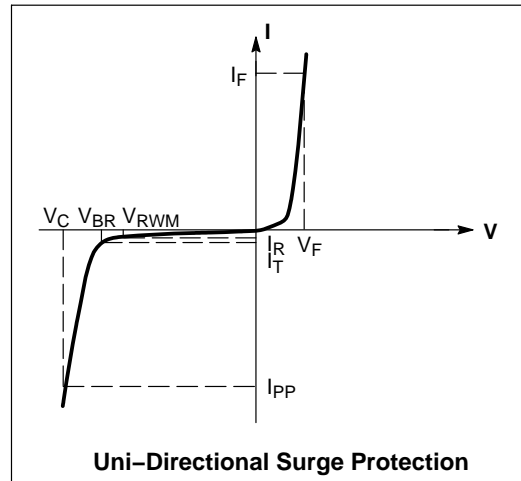
4-Channel, 6-Lead, UDFN-8 Package			
Pin	Name	Type	Description
1	V <sub>CC</sub>	HV V <sub>DD</sub>	HV ESD Channel
2	N/C		No Connect
3	N/C		No Connect
4	N/C		No Connect
5	GND		Ground
6	GND		Ground

**PACKAGE / PINOUT DIAGRAMS**



**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>
V <sub>RWM</sub>	Working Peak Reverse Voltage
I <sub>R</sub>	Maximum Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
∅V <sub>BR</sub>	Maximum Temperature Coefficient of V <sub>BR</sub>
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>



**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 <sub>p</sub> = 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 <sub>RWM</sub> (V) (Note 1) Max	I <sub>R</sub> @ V <sub>RWM</sub> (μA) Max	Breakdown Voltage				V <sub>C</sub> @ I <sub>PP</sub> (8 x 20 μs) (Note 3)	
				V <sub>BR</sub> V (Note 2)			@ I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (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<sub>RWM</sub>), which should be equal to or greater than the DC or continuous peak operating voltage level.
2. V<sub>BR</sub> measured at pulse test current I<sub>T</sub> at an ambient temperature of 25°C.
3. Surge current waveform per Figure 1.

# NSPM8151, NSPM8181

## TYPICAL CHARACTERISTICS

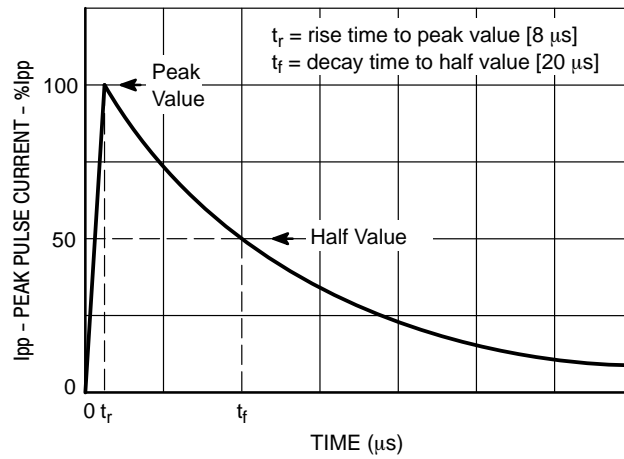


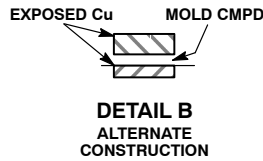
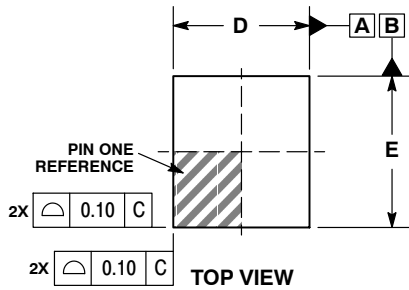
Figure 1. IEC61000-4-5 8/20  $\mu$ s Pulse Waveform



SCALE 4:1

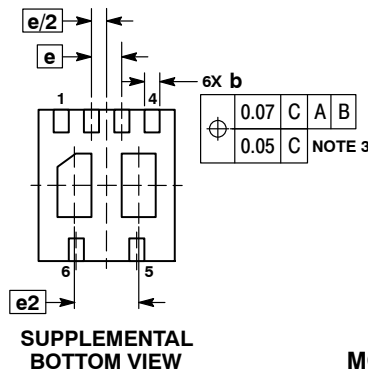
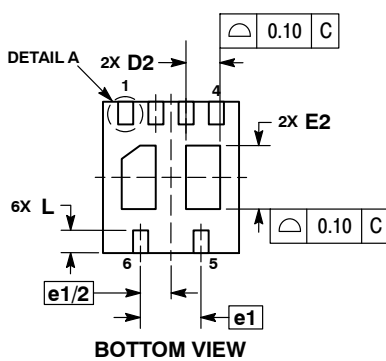
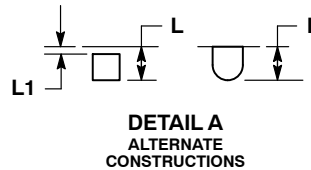
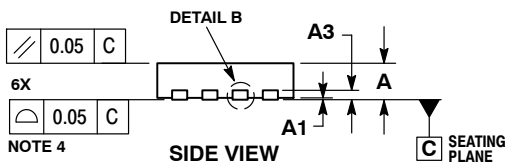
UDFN6, 1.8x2, 0.4P  
CASE 517CS  
ISSUE O

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



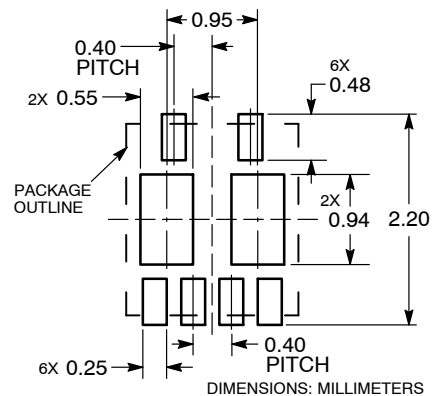
GENERIC MARKING DIAGRAM\*



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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