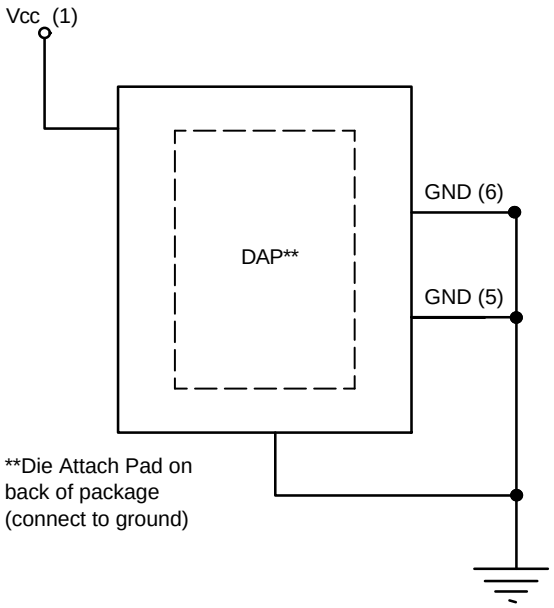
NSPM5131

13.5 V Unidirectional ESD and Surge Protection Device

Features

- Unidirectional High Voltage ESD Protection
- 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 160 A (8/20 μs)
- These Devices are Pb−Free and are RoHS Compliant

APPLICATION DIAGRAM



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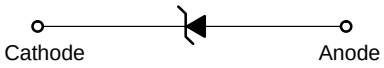
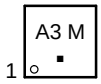
UDFN6
CASE 517CS

BLOCK DIAGRAM



MARKING DIAGRAM



A3 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

ORDERING INFORMATION

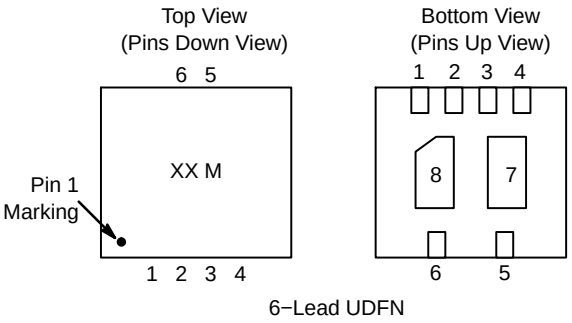
Device	Package	Shipping†
NSPM5131MUTBG	UDFN6 (Pb−Free)	3000/Tape & Reel

†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.

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
7	GND		Ground
8	GND		Ground

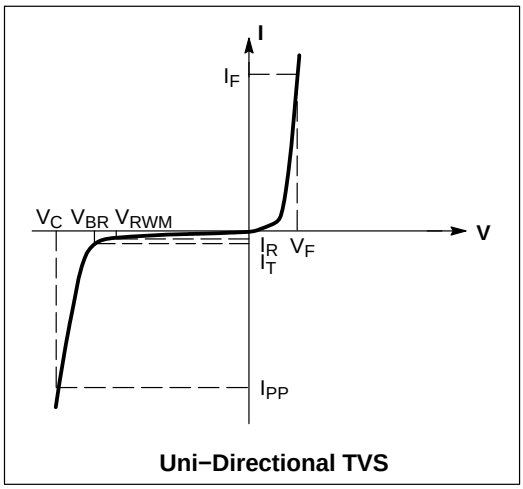
PACKAGE / PINOUT DIAGRAMS



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
ΘV_{BR}	Maximum Temperature Coefficient of V_{BR}
I_F	Forward Current
V_F	Forward Voltage @ I_F



Uni−Directional TVS

SPECIFICATIONS

Table 2. 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)	160	A

Stresses at or above those listed in Maximum Ratings table may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Also, due to variations in test equipment, stresses shown above are averages.

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)	
				V_{BR} V (Note 2)			@ I_T (mA)	V_C (V)	I_{PP} (A)
		Max	Max	Min	Nom	Max		Max	
NSPM5131	A3	13.5	1	13.6	15.5	17.5	1	21.5	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 transient suppressor 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 2.

TYPICAL CHARACTERISTICS

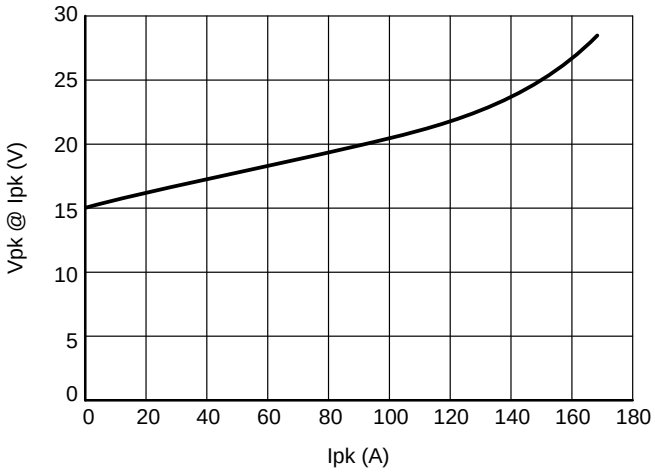


Figure 1. Clamping Voltage vs. Peak Pulse Current (t_p = 8/20 μs)

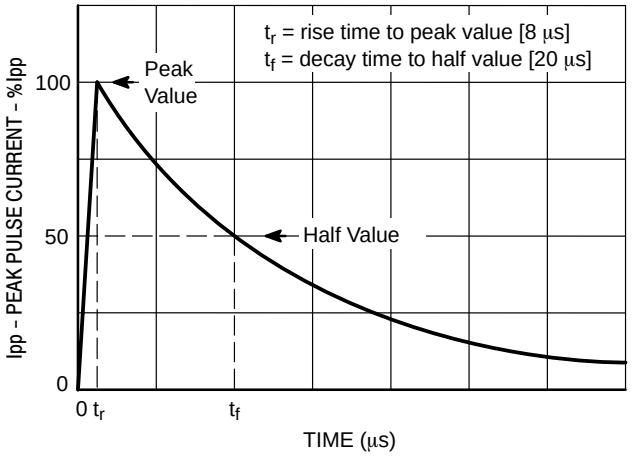
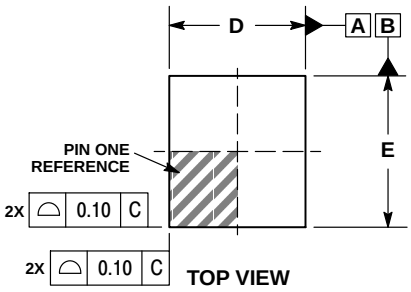


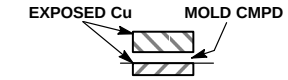
Figure 2. IEC61000−4−5 8/20 μs Pulse Waveform

NSPM5131

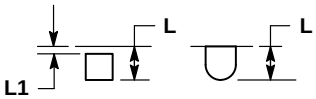
PACKAGE DIMENSIONS

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





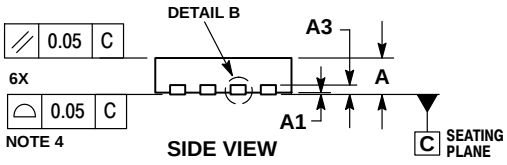
DETAIL B
ALTERNATE CONSTRUCTION

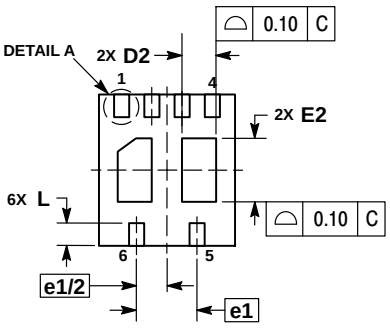


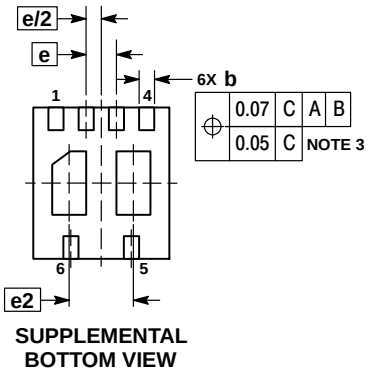
DETAIL A
ALTERNATE CONSTRUCTIONS

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.

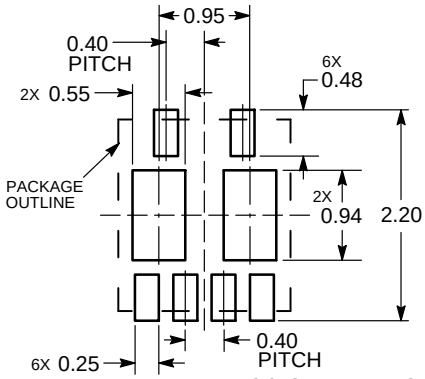
	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.125 REF	
b	0.15	0.25
D	1.80 BSC	
D2	0.35	0.55
E	2.00 BSC	
E2	0.74	0.94
e	0.40 BSC	
e1	0.80 BSC	
e2	0.95 BSC	
L	0.20	0.40
L1	---	0.15







RECOMMENDED MOUNTING FOOTPRINT*



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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
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ON Semiconductor Website: **www.onsemi.com**

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