

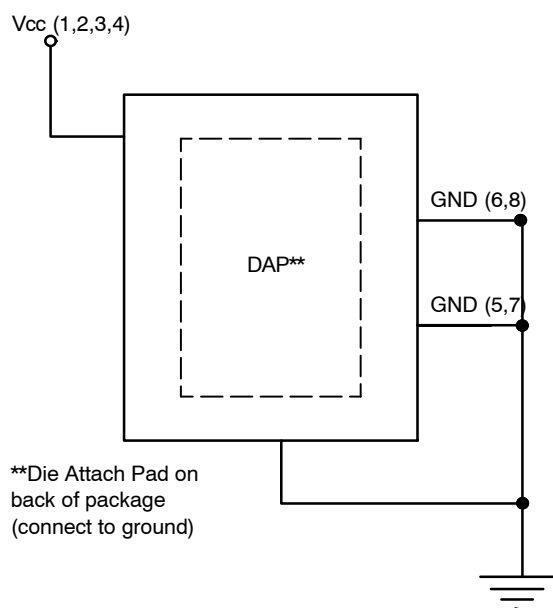
# NSPU5132

## 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



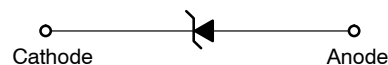
ON Semiconductor®

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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

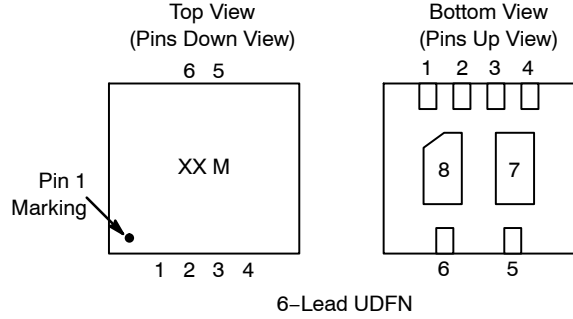
Device	Package	Shipping†
NSPU5132MUTBG	UDFN6 (Pb-Free)	3000 / Tape & Reel

†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.

Table 1. PIN DESCRIPTIONS

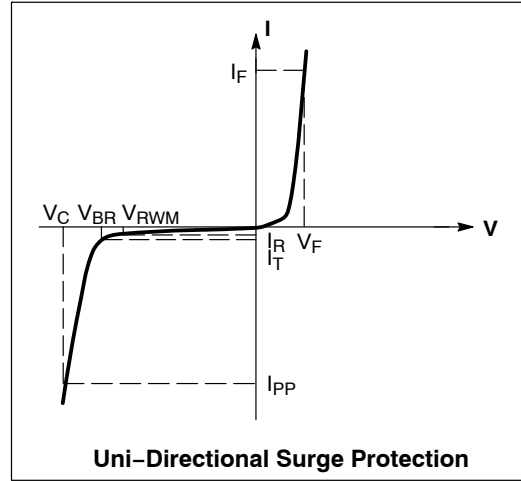
6-Lead, UDFN-8 Package		
Pin	Name	Description
1	V <sub>CC</sub>	Cathode
2	V <sub>CC</sub>	Cathode
3	V <sub>CC</sub>	Cathode
4	V <sub>CC</sub>	Cathode
5	GND	Anode
6	GND	Anode
7	GND	Anode
8	GND	Anode

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
θV <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)	200	A
Peak Pulse Power (t <sub>p</sub> = 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 <sub>RWM</sub> (V) (Note 1)	I <sub>R</sub> @ V <sub>RWM</sub> (μA)	Breakdown Voltage			V <sub>C</sub> @ I <sub>PP</sub> (8 x 20 μs) (Note 3)		Junction Capacitance (V <sub>R</sub> = 0 V, f = 1 MHz, Pin 1 to Pin 5)	
				V <sub>BR</sub> V (Note 2)			V <sub>C</sub> (V)	I <sub>PP</sub> (A)	C <sub>J</sub> (pF)	
		Max	Max	Min	Nom	Max	Max		Typ	Max
NSPU5132	4W	13.5	0.5	13.6	15.5	17.5	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<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.

TYPICAL CHARACTERISTICS

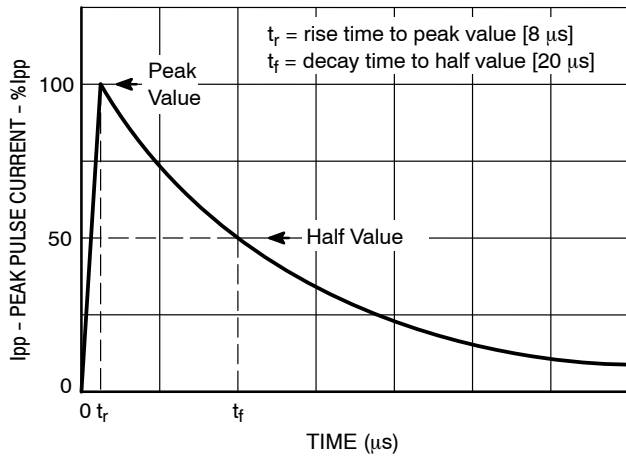


Figure 1. IEC61000-4-5 8/20  $\mu$ s Pulse Waveform

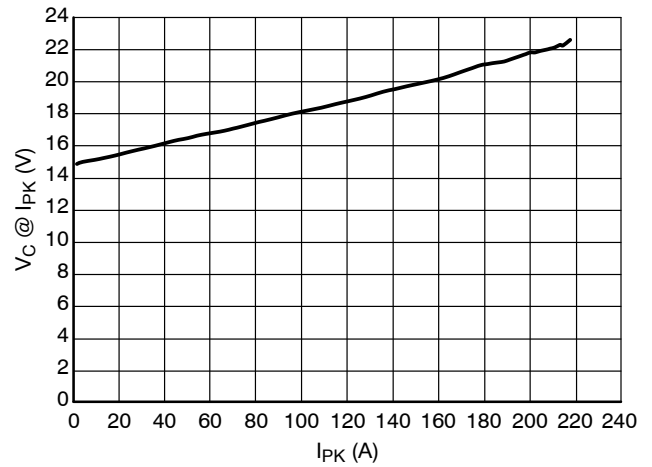


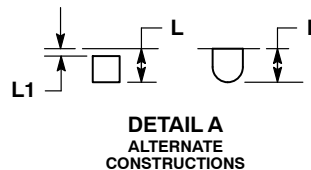
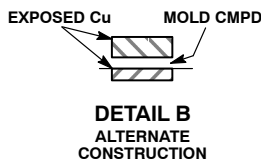
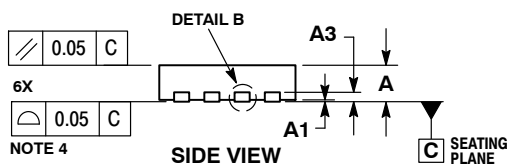
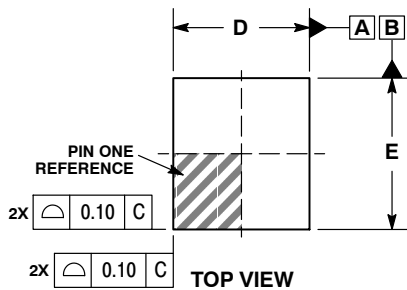
Figure 2. Positive Clamping Voltage vs. Peak Pulse Current



SCALE 4:1

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

DATE 30 APR 2013



## NOTES:

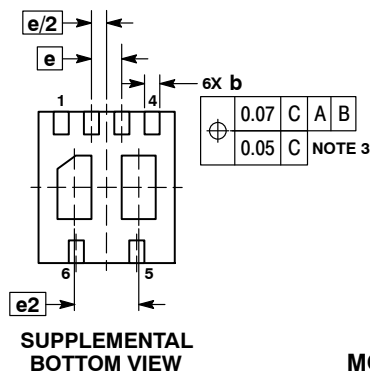
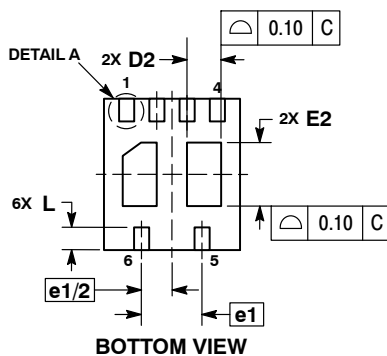
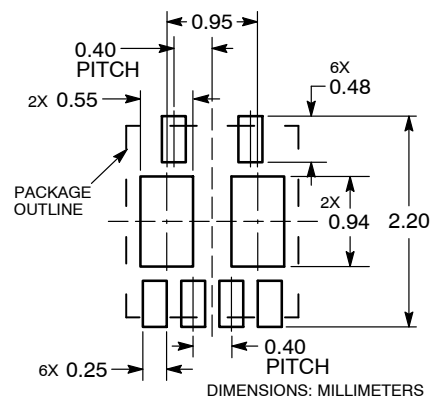
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINALS AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

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

**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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