

# NP Series

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristics (Note 1)	Symbol	Min	Typ	Max	Unit
Breakover Voltage (Both Polarities) NP0640SxT3G NP0720SxT3G NP0900SxT3G NP1100SxT3G NP1300SxT3G NP1500SxT3G NP1800SxT3G NP2100SxT3G NP2300SxT3G NP2600SxT3G NP3100SxT3G NP3500SxT3G	V <sub>(BO)</sub>			77 88 98 130 160 180 220 240 260 300 350 400	V
Off-State Voltage (Both Polarities) NP0640SxT3G NP0720SxT3G NP0900SxT3G NP1100SxT3G NP1300SxT3G NP1500SxT3G NP1800SxT3G NP2100SxT3G NP2300SxT3G NP2600SxT3G NP3100SxT3G NP3500SxT3G	V <sub>DRM</sub>	58 65 75 90 120 140 170 180 190 220 275 320			V
Off State Current (V <sub>D1</sub> = 50 V) Both Polarities (V <sub>D2</sub> = V <sub>DRM</sub> ) Both Polarities	I <sub>DRM1</sub> I <sub>DRM2</sub>			2.0 5.0	μA μA
Holding Current (Both Polarities) (Note 4) V <sub>S</sub> = 500 V; I <sub>T</sub> = 2.2 A	I <sub>H</sub>	150	250	–	mA
On-State Voltage I <sub>T</sub> = 1.0 A(pk) (PW = 300 μSec, DC = 2%)	V <sub>T</sub>	–	–	4.0	V
Maximum Non-Repetitive Rate of Change of On-State Current (Note 1) (Haefely test method, 1.0 pk < 100 A)	di/dt	–	–	500	A/μSec
Critical Rate of Rise of Off-State Voltage (Linear Waveform, V <sub>D</sub> = 0.8 V <sub>DRM</sub> , T <sub>J</sub> = 25°C)	dv/dt	5.0	–	–	kV/μSec

## CAPACITANCE

Characteristics	Symbol	Typ			Unit
		A	B	C	
(f=1.0 MHz, 1.0 V <sub>rms</sub> , 2 Vdc bias) NP0640SxT3G NP0720SxT3G NP0900SxT3G NP1100SxT3G NP1300SxT3G NP1500SxT3G NP1800SxT3G NP2100SxT3G NP2300SxT3G NP2600SxT3G NP3100SxT3G NP3500SxT3G	C <sub>o</sub>	84 79 65 58 46 44 39 37 36 33 31 28	129 123 122 95 75 70 59 59 56 52 47 44	222 198 122 154 120 113 99 97 56 81 76 71	pF

1. Electrical parameters are based on pulsed test methods.
2. di/dt must not be exceeded of a maximum of 100 A/μSec in this application.
3. Measured under pulsed conditions to reduce heating
4. Allow cooling before testing second polarity.

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## SURGE RATINGS

Characteristics	Symbol	A	B	C	Unit
Nominal Pulse					A(pk)
Surge Short Circuit Current Non – Repetitive					
Double Exponential Decay Waveform (Notes 5, 6 and 7)					
2 x 10 $\mu$ Sec	I <sub>PPS1</sub>	150	250	500	
10 x 160 $\mu$ Sec	I <sub>PPS3</sub>	90	150	200	
10 x 360 $\mu$ Sec	I <sub>PPS4</sub>	75	125	150	
10 x 560 $\mu$ Sec	I <sub>PPS5</sub>	50	100	150	
10 x 700 $\mu$ Sec	I <sub>PPS6</sub>	75	100	200	
10 x 1000 $\mu$ Sec	I <sub>PPS7</sub>	50	80	100	

5. Allow cooling before testing second polarity.
6. Measured under pulse conditions to reduce heating.
7. Nominal values may not represent the maximum capability of a device.

## THERMAL CHARACTERISTICS

Symbol	Rating	Value	Unit
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C
T <sub>J</sub>	Operating Temperature Range	-40 to +150	°C
R <sub>ΘJA</sub>	Thermal Resistance: Junction-to-Ambient Per EIA/JESD51-3, PCB = FR4 3"x4.5"x0.06" Fan out in a 3x3 inch pattern, 2 oz copper track.	90	°C/W

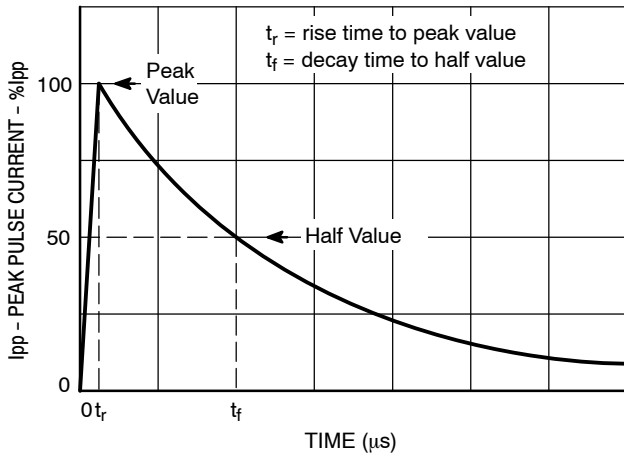


Figure 1. Exponential Decay Pulse Waveform

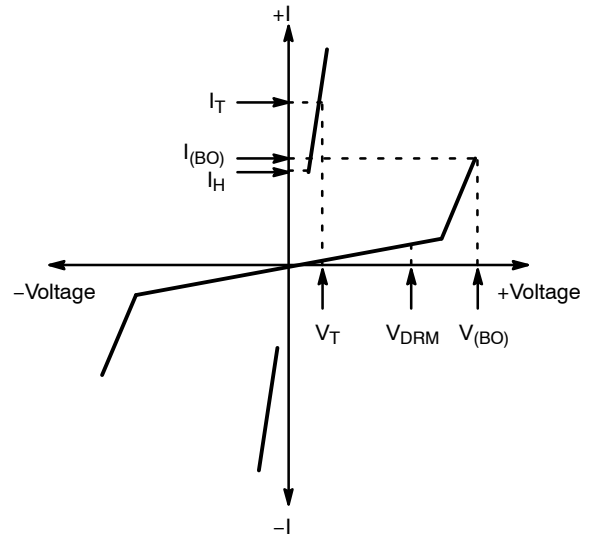


Figure 2. Voltage Current Characteristics of TSPD

Symbol	Parameter
V <sub>DRM</sub>	Peak Off State Voltage
V <sub>(BO)</sub>	Breakover Voltage
I <sub>(BO)</sub>	Breakover Current
I <sub>H</sub>	Holding Current
V <sub>T</sub>	On State Voltage
I <sub>T</sub>	On State Current

## NP Series

### ORDERING INFORMATION

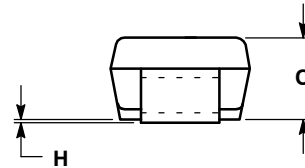
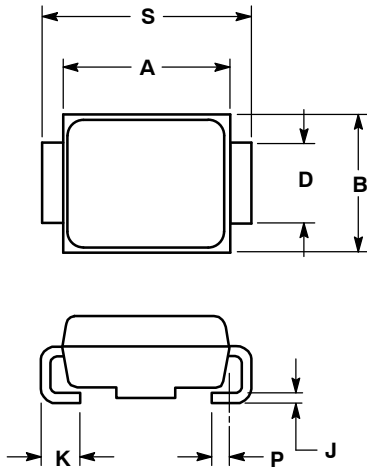
Part Number	Marking	Case	Shipping†
NP0640SAT3G	064A	SMB (Pb-Free)	2500 / Tape and Reel
NP0640SBT3G	064B		
NP0640SCT3G	064C		
NP0720SAT3G	072A		
NP0720SBT3G	072B		
NP0720SCT3G	072C		
NP0900SAT3G	090A		
NP0900SBT3G	090B		
NP0900SCT3G	090C		
NP1100SAT3G	110A		
NP1100SBT3G	110B		
NP1100SCT3G	110C		
NP1300SAT3G	130A		
NP1300SBT3G	130B		
NP1300SCT3G	130C		
NP1500SAT3G	150A		
NP1500SBT3G	150B		
NP1500SCT3G	150C		
NP1800SAT3G	180A		
NP1800SBT3G	180B		
NP1800SCT3G	180C		
NP2100SAT3G	210A		
NP2100SBT3G	210B		
NP2100SCT3G	210C		
NP2300SAT3G	230A		
NP2300SBT3G	230B		
NP2300SCT3G	230C		
NP2600SAT3G	260A		
NP2600SBT3G	260B		
NP2600SCT3G	260C		
NP3100SAT3G	310A		
NP3100SBT3G	310B		
NP3100SCT3G	310C		
NP3500SAT3G	350A		
NP3500SBT3G	350B		
NP3500SCT3G	350C		

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

# NP Series

## PACKAGE DIMENSIONS

### SMB CASE 403C-01 ISSUE A

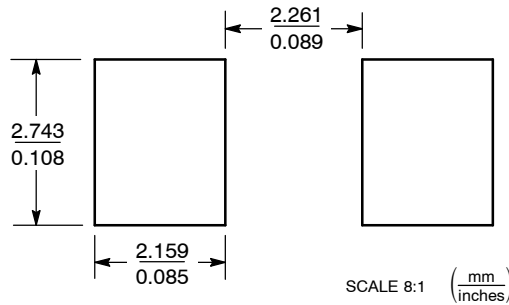


#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.130	0.150	3.30	3.81
C	0.075	0.095	1.90	2.41
D	0.077	0.083	1.96	2.11
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020	REF	0.51	REF
S	0.205	0.220	5.21	5.59

### SOLDERING 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.

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