

# NSA5.0AT3G

## 400 Watt Peak Power Zener Transient Voltage Suppressor

### Unidirectional

The NSA5.0AT3G is designed to protect voltage sensitive components from high voltage, high energy transients. It has excellent clamping capability, high surge capability, low zener impedance and a fast response time. The NSA5.0AT3G is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer applications.

#### Features

- Peak Power – 400 W @ 1 ms
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- ESD Rating IEC 61000-4-2 (> 30 kV)
- Response Time is Typically < 1 ns
- Flat Handling Surface for Accurate Placement
- Package Design for Top Slide or Bottom Circuit Board Mounting
- Low Profile Package
- Pb-Free Packages are Available

#### Mechanical Characteristics:

**CASE:** Void-free, transfer-molded plastic

**FINISH:** All external surfaces are corrosion resistant and leads are readily solderable

**MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:**  
260°C for 10 Seconds

**POLARITY:** Cathode indicated by molded polarity notch or polarity band

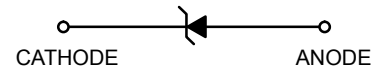
**MOUNTING POSITION:** Any



Expertise Applied | Answers Delivered

Littelfuse.com

### PLASTIC SURFACE MOUNT ZENER OVERVOLTAGE TRANSIENT SUPPRESSOR 400 W PEAK POWER



SMA  
CASE 403D  
PLASTIC

#### MARKING DIAGRAM



- QA = Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

#### ORDERING INFORMATION

Device	Package	Shipping
NSA5.0AT3G	SMA (Pb-Free)	5000/Tape & Reel

#### DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 2 of this data sheet.

# NSA5.0AT3G

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1) @ $T_L = 25^\circ\text{C}$ , Pulse Width = 1 ms	$P_{PK}$	400	W
DC Power Dissipation @ $T_L = 75^\circ\text{C}$ Measured Zero Lead Length (Note 2) Derate Above $75^\circ\text{C}$	$P_D$	1.5	W
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	20	mW/ $^\circ\text{C}$
		50	$^\circ\text{C}/\text{W}$
DC Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	0.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	4.0	mW/ $^\circ\text{C}$
		250	$^\circ\text{C}/\text{W}$
Forward Surge Current (Note 4) @ $T_A = 25^\circ\text{C}$	$I_{FSM}$	40	A
Operating and Storage Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

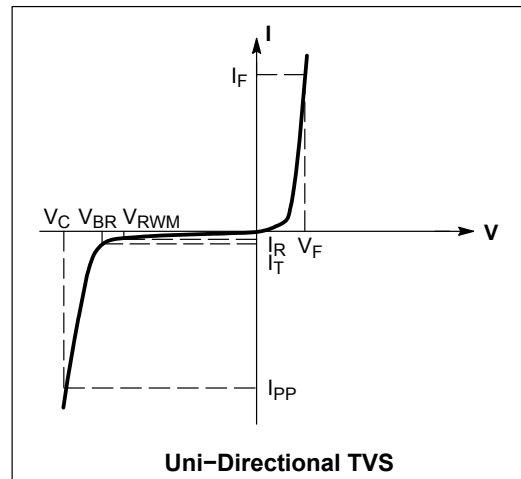
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

- 10 X 1000  $\mu\text{s}$ , non-repetitive.
- 1" square copper pad, FR-4 board.
- FR-4 board, using Littelfuse minimum recommended footprint, as shown in 403D case outline dimensions spec.
- 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



## ELECTRICAL CHARACTERISTICS

Device	Device Marking	$V_{RWM}$ (Note 5) Volts	$I_R @$ $V_{RWM}$ $\mu\text{A}$	Breakdown Voltage			$V_C @ I_{PP}$ (Note 7)		C Typ. (Note 8) pF	$V_F @ I_F$ (Note 9)	
				$V_{BR}$ (Volts) (Note 6)			$V_C$	$I_{PP}$		Max	
				Min	Nom	Max	mA	Volts	Amps	V	
NSA5.0AT3G	QA	5.0	400	6.4	6.7	7.0	10	9.2	43.5	2450	3.5

- 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.
- $V_{BR}$  measured at pulse test current  $I_T$  at an ambient temperature of  $25^\circ\text{C}$ .
- Surge current waveform per Figure 2 and derate per Figure 3.
- Bias voltage = 0 V, F = 1.0 MHz,  $T_J = 25^\circ\text{C}$ .
- 1/2 sine wave or equivalent, PW = 8.3 ms, non-repetitive,  $I_F = 30$  A.

RATING AND TYPICAL CHARACTERISTIC CURVES

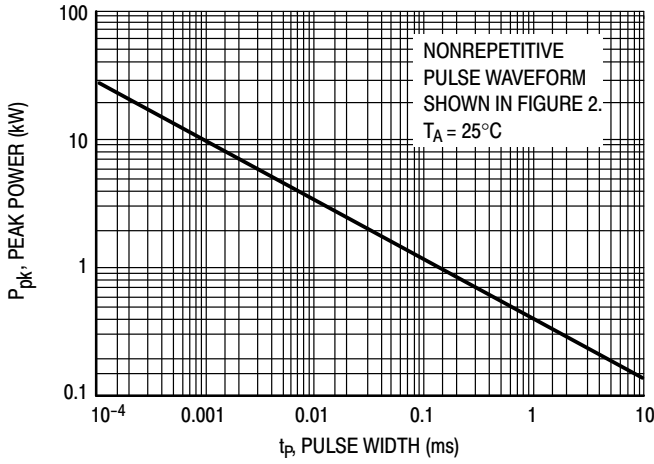


Figure 1. Pulse Rating Curve

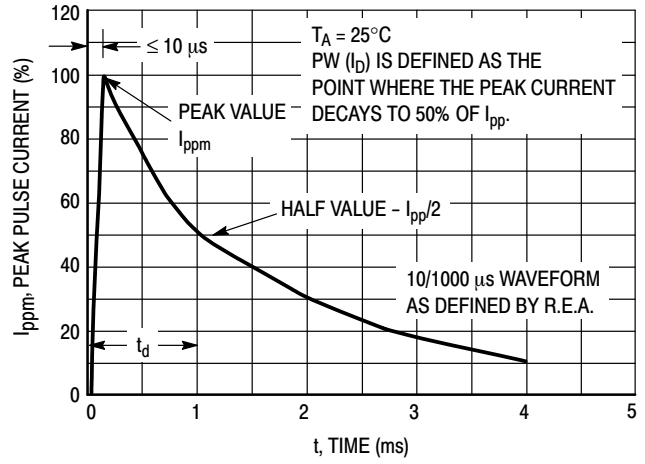


Figure 2. Pulse Waveform

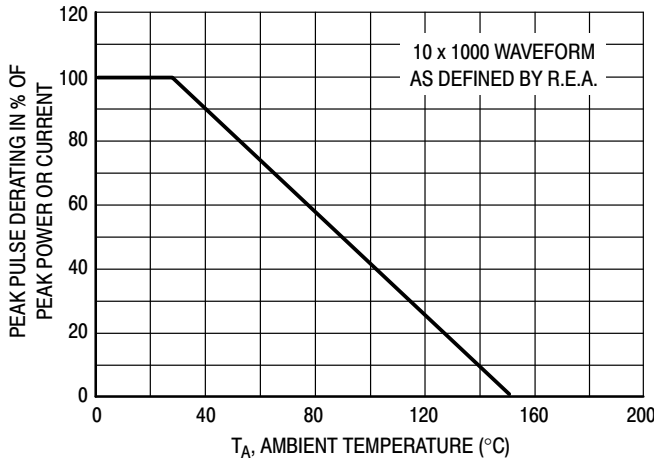


Figure 3. Pulse Derating Curve

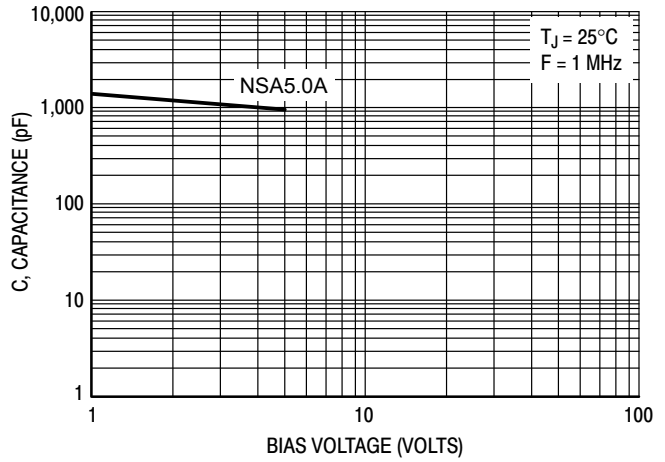


Figure 4. Typical Junction Capacitance vs. Bias Voltage

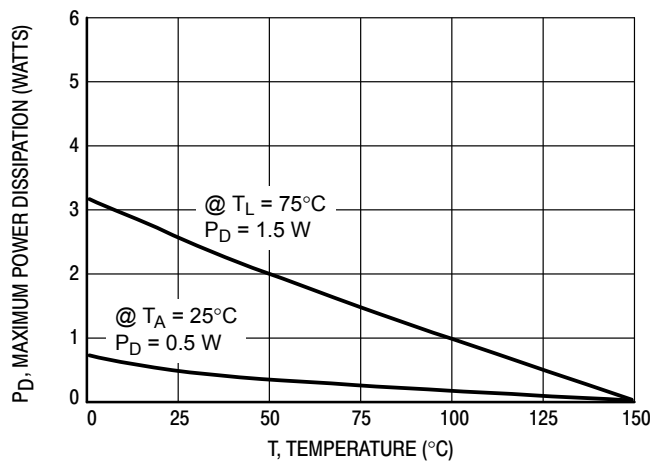
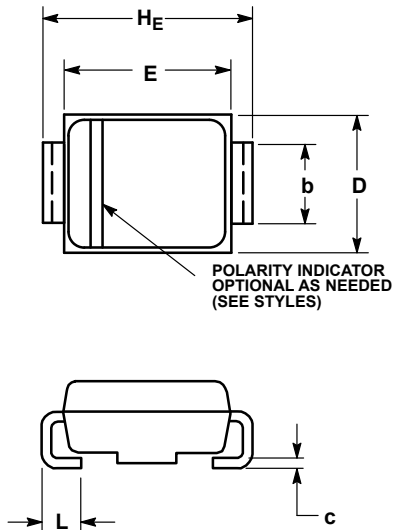


Figure 5. Steady State Power Derating

# NSA5.0AT3G

## PACKAGE DIMENSIONS

SMA  
CASE 403D-02  
ISSUE E



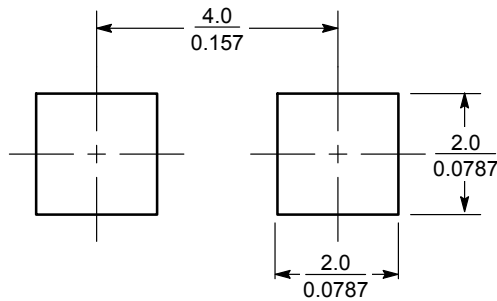
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 403D-01 OBSOLETE, NEW STANDARD IS 403D-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.97	2.10	2.20	0.078	0.083	0.087
A1	0.05	0.10	0.15	0.002	0.004	0.006
b	1.27	1.45	1.63	0.050	0.057	0.064
c	0.15	0.28	0.41	0.006	0.011	0.016
D	2.29	2.60	2.92	0.090	0.103	0.115
E	4.06	4.32	4.57	0.160	0.170	0.180
HE	4.83	5.21	5.59	0.190	0.205	0.220
L	0.76	1.14	1.52	0.030	0.045	0.060

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

### SOLDERING FOOTPRINT



SCALE 8:1  $\left(\frac{\text{mm}}{\text{inches}}\right)$

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