

# NSQA6V8AW5T2 Series

## Low Capacitance Quad Array for ESD Protection

This integrated transient voltage suppressor device (TVS) is designed for applications requiring transient overvoltage protection. It is intended for use in sensitive equipment such as computers, printers, business machines, communication systems, medical equipment, and other applications. Its integrated design provides very effective and reliable protection for four separate lines using only one package. These devices are ideal for situations where board space is at a premium.

### Features

- ESD Protection: IEC61000-4-2: Level 4  
MILSTD 883C – Method 3015-6: Class 3
- Four Separate Unidirectional Configurations for Protection
- Low Leakage Current < 1  $\mu$ A
- Power Dissipation: 380 mW
- Small SC-88A SMT Package
- Low Capacitance
- Pb-Free Package is Available

### Benefits

- Provides Protection for ESD Industry Standards: IEC 61000, HBM
- Protects the Line Against Transient Voltage Conditions in Either Direction
- Minimize Power Consumption of the System
- Minimize PCB Board Space

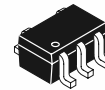
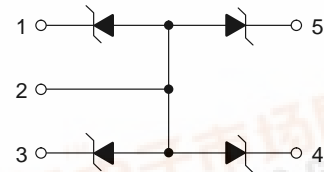
### Typical Applications

- Instrumentation Equipment
- Serial and Parallel Ports
- Microprocessor Based Equipment
- Notebooks, Desktops, Servers
- Cellular and Portable Equipment



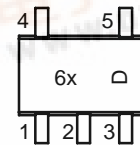
ON Semiconductor®

<http://onsemi.com>



SC-88A/SOT-323  
CASE 419A

### MARKING DIAGRAM



- x = H for NSQA6V8AW5T2  
X for NSQA12VAW5T2
- D = One Digit Date Code

### ORDERING INFORMATION

Device	Package	Shipping†
NSQA6V8AW5T2	SC-88A	3000/Tape & Reel
NSQA6V8AW5T2G	SC-88A (Pb-Free)	3000/Tape & Reel
NSQA12VAW5T2	SC-88A	3000/Tape & Reel
NSQA12VAW5T2G	SC-88A (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 Specifications Brochure, BRD8011/D.



## NSQA6V8AW5T2 Series

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

Rating	Symbol	Value	Unit
Peak Power Dissipation 8 × 20 μsec Double Exponential Waveform (Note 1)	$P_{PK}$	20	W
Steady State Power – 1 Diode (Note 2)	$P_D$	380	mW
Thermal Resistance – Junction-to-Ambient Above 25°C, Derate	$R_{\theta JA}$	327 3.05	°C/W mW/°C
Operating Junction Temperature Range	$T_J$	-40 to +125	°C
Storage Temperature Range	$T_{stg}$	-55 to +150	°C
Lead Solder Temperature – Maximum 10 Seconds Duration	$T_L$	260	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Non-repetitive current pulse per Figure 1.
2. Only 1 diode under power. For all 4 diodes under power,  $P_D$  will be 25%. Mounted on FR4 board with min pad.

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

#### NSQA6V8AW5T2

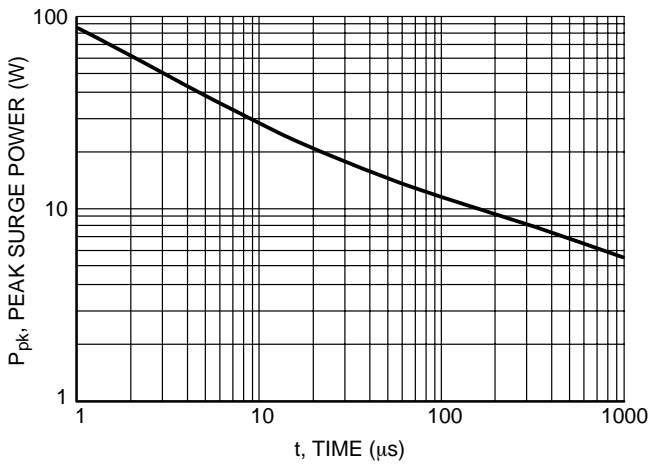
Characteristic	Symbol	Min	Typ	Max	Unit
Breakdown Voltage ( $I_T = 1\text{ mA}$ ) (Note 3)	$V_{BR}$	6.4	6.8	7.1	V
Leakage Current ( $V_{RWM} = 5.0\text{ V}$ )	$I_R$	–	–	1.0	μA
Clamping Voltage 1 ( $I_{PP} = 1.6\text{ A}$ , 8 × 20 μsec Waveform)	$V_C$	–	–	13	V
Maximum Peak Pulse Current (8 × 20 μsec Waveform)	$I_{PP}$	–	–	1.6	A
Junction Capacitance – ( $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ ) – ( $V_R = 3.0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_J$	–	12 6.7	15 9.5	pF

#### NSQA12VAW5T2

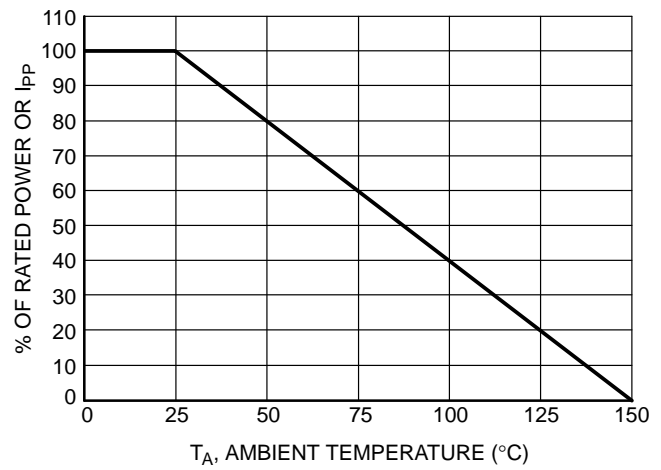
Breakdown Voltage ( $I_T = 5\text{ mA}$ ) (Note 3)	$V_{BR}$	11.4	12.0	12.7	V
Leakage Current ( $V_{RWM} = 9.0\text{ V}$ )	$I_R$	–	–	0.05	μA
Zener Impedance ( $I_T = 5\text{ mA}$ )	$Z_Z$	–	–	30	Ω
Clamping Voltage 1 ( $I_{PP} = 0.9\text{ A}$ , 8 × 20 μsec Waveform)	$V_C$	–	–	23	V
Maximum Peak Pulse Current (8 × 20 μsec Waveform)	$I_{PP}$	–	–	0.9	A
Junction Capacitance – ( $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_J$	–	–	15	pF

3.  $V_{BR}$  is measured at pulse test current  $I_T$ .

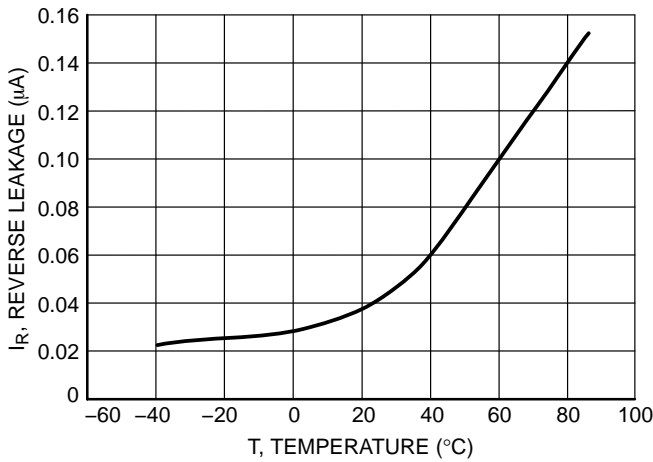
## NSQA6V8AW5T2 Series



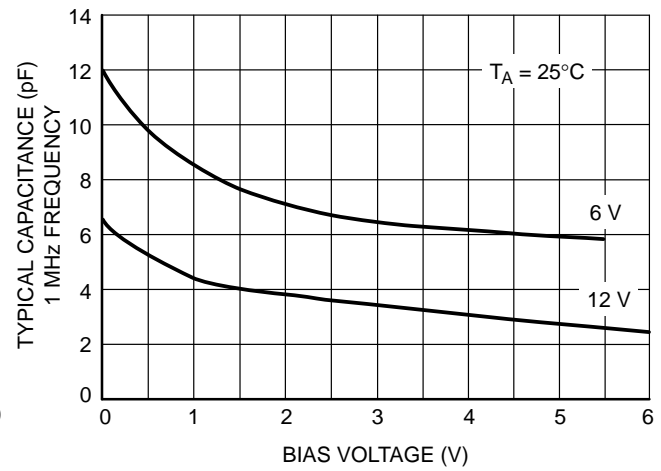
**Figure 1. Pulse Width**



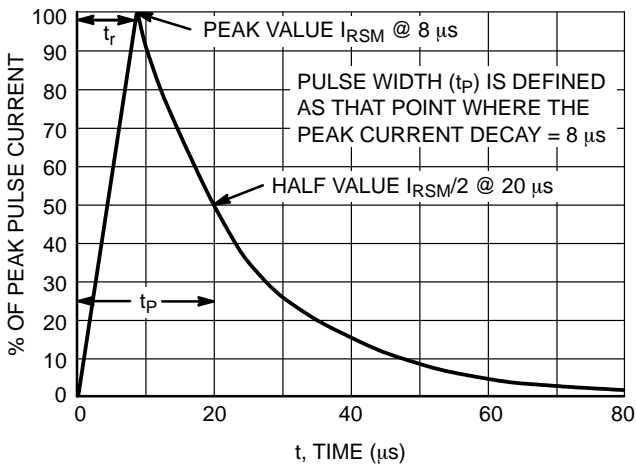
**Figure 2. Power Derating Curve**



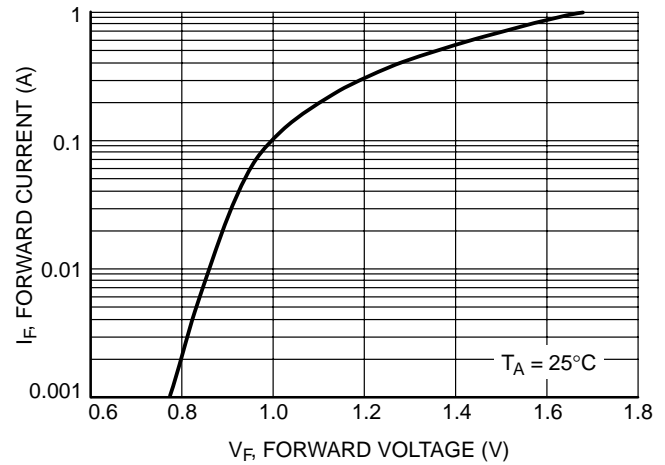
**Figure 3. Reverse Leakage versus Temperature**



**Figure 4. Capacitance**



**Figure 5.  $8 \times 20 \mu$ s Pulse Waveform**

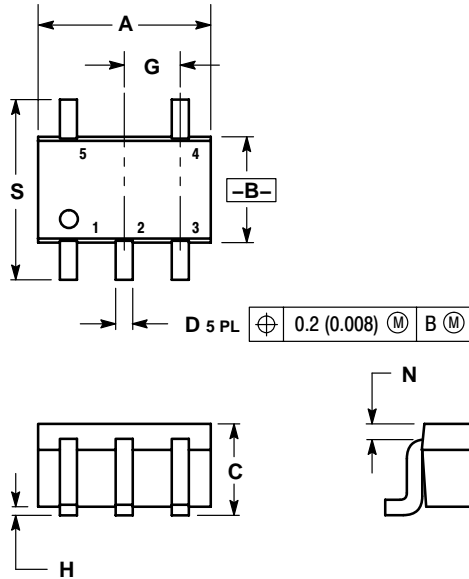


**Figure 6. Forward Voltage**

# NSQA6V8AW5T2 Series

## PACKAGE DIMENSIONS

**SC-88A/SOT-323**  
**5-LEAD PACKAGE**  
**CASE 419A-02**  
**ISSUE G**

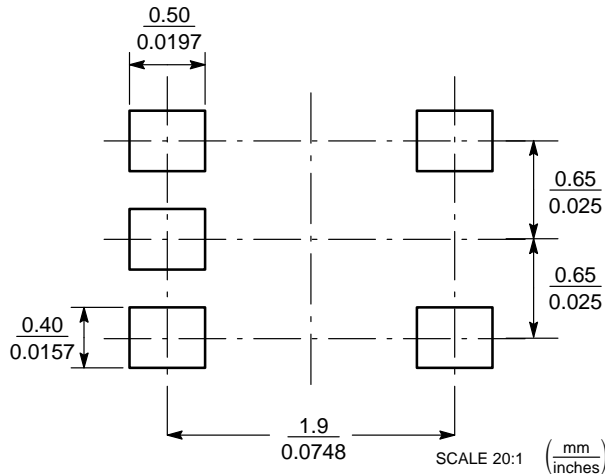


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

### 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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