

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 μ 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

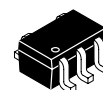
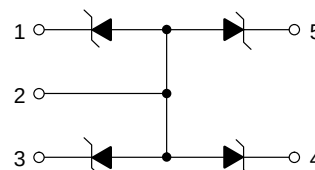
Typical Applications

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



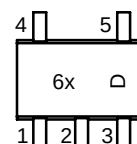
ON Semiconductor®

<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

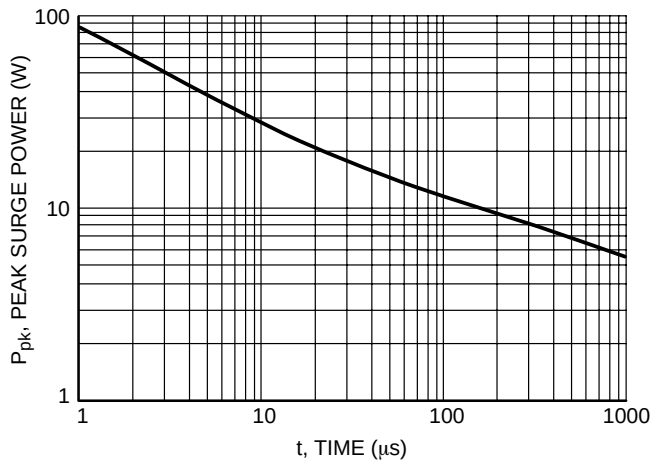


Figure 1. Pulse Width

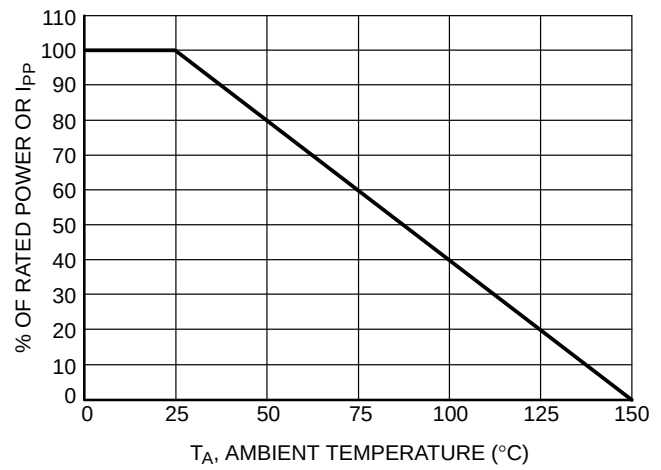


Figure 2. Power Derating Curve

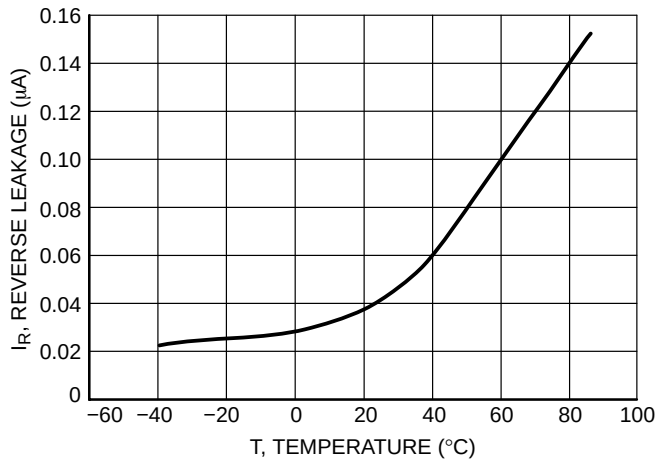


Figure 3. Reverse Leakage versus Temperature

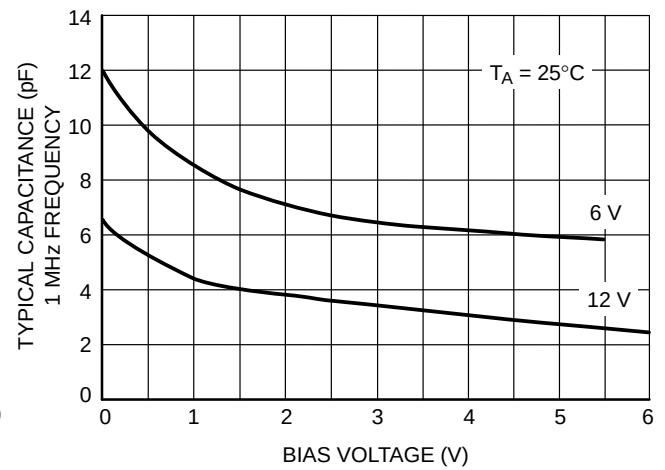


Figure 4. Capacitance

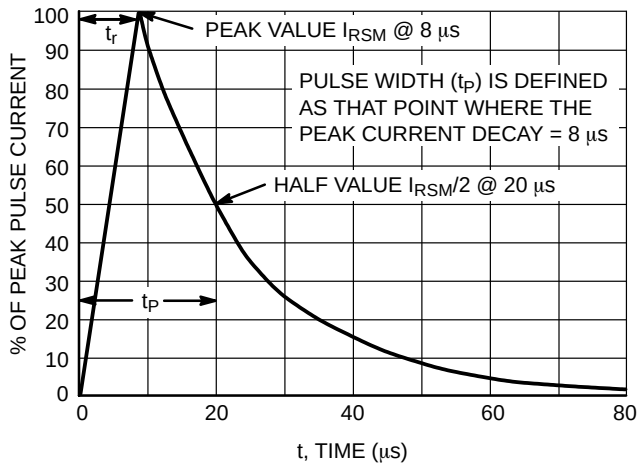


Figure 5. 8 $\times$ 20 μs Pulse Waveform

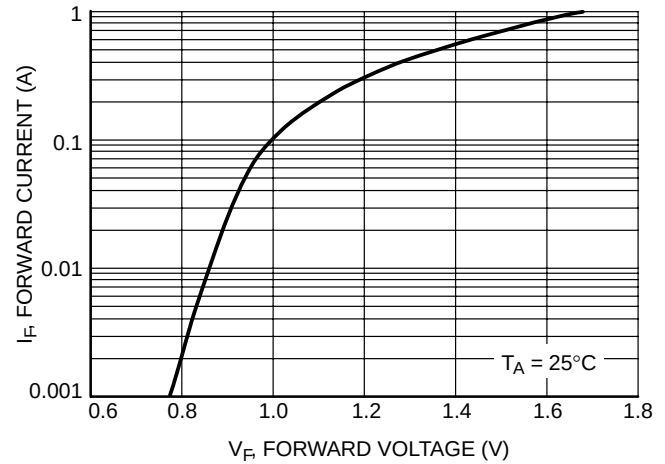
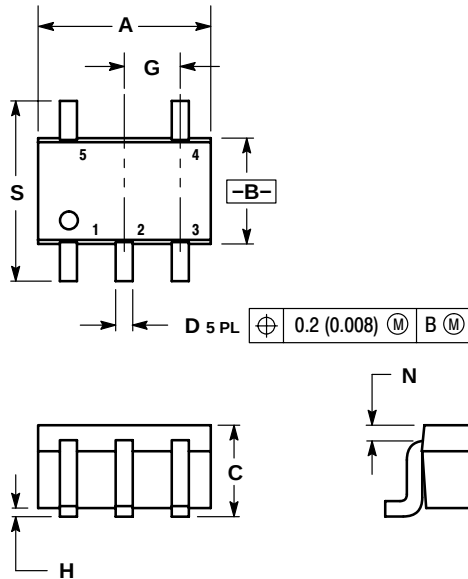


Figure 6. Forward Voltage

NSQA6V8AW5T2 Series

PACKAGE DIMENSIONS

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

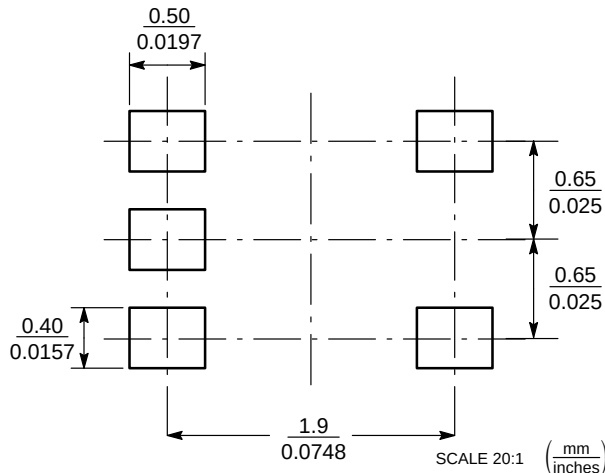


NOTES:

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.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.

NSQA6V8AW5T2/D