

# NZQA5V6AXV5 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 @ 3 Volts
- Power Dissipation: 380 mW
- Small SOT-553 SMT Package
- Low Capacitance
- Complies to USB 1.1 Low Speed & Full Speed Specifications
- These are Pb-Free Devices

### Benefits

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

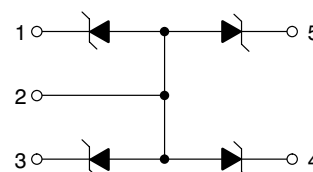
### Typical Applications

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



ON Semiconductor®

<http://onsemi.com>



SOT-553  
CASE 463B  
PLASTIC

### MARKING DIAGRAM



xx = Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping†
NZQA5V6AXV5T1	SOT-553*	4000/Tape & Reel
NZQA5V6AXV5T1G	SOT-553*	4000/Tape & Reel
NZQA6V8AXV5T1	SOT-553*	4000/Tape & Reel
NZQA6V8AXV5T1G	SOT-553*	4000/Tape & Reel
NZQA6V8AXV5T3	SOT-553*	16000/Tape & Reel
NZQA6V8AXV5T3G	SOT-553*	16000/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.

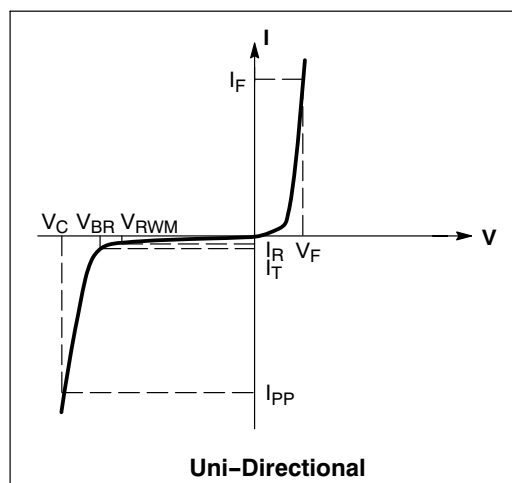
\*This package is inherently Pb-Free.

# NZQA5V6AXV5 Series

## 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
$\Theta_{V_{BR}}$	Maximum Temperature Coefficient of $V_{BR}$
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$I_{ZK}$	Reverse Current
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$



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

Characteristic	Symbol	Value	Unit
Peak Power Dissipation (8 X 20 $\mu\text{s}$ @ $T_A = 25^\circ\text{C}$ ) (Note 1)	$P_{PK}$	20	W
Steady State Power - 1 Diode (Note 2)	$P_D$	380	mW
Thermal Resistance, Junction-to-Ambient Above $25^\circ\text{C}$ , Derate	$R_{\theta JA}$	327 3.05	$^\circ\text{C}/\text{W}$ $\text{mW}/^\circ\text{C}$
Maximum Junction Temperature	$T_{Jmax}$	150	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_J T_{stg}$	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature (10 seconds duration)	$T_L$	260	$^\circ\text{C}$

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.

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

Device	Device Marking	Breakdown Voltage $V_{BR}$ @ 1 mA (Volts)			Leakage Current $I_{RM}$ @ $V_{RM}$		$V_C$ Max @ $I_{PP}$		Typ Capacitance @ 0 V Bias (pF) (Note 3)		Typ Capacitance @ 3 V Bias (pF) (Note 3)	
		Min	Nom	Max	$V_{RWM}$	$I_{RWM}$ ( $\mu\text{A}$ )	$V_C$ (V)	$I_{PP}$ (A)	Typ	Max	Typ	Max
NZQA5V6AXV5	5P	5.3	5.6	5.9	3.0	1.0	13	1.6	13	17	7.0	11.5
NZQA6V8AXV5	6H	6.47	6.8	7.14	4.3	1.0	13	1.6	12	15	6.7	9.5

1. Non-repetitive current per Figure 1.
2. Only 1 diode under power. For all 4 diodes under power,  $P_D$  will be 25%. Mounted on FR-4 board with min pad.
3. Capacitance of one diode at  $f = 1$  MHz,  $V_R = 0$  V,  $T_A = 25^\circ\text{C}$

# NZQA5V6AXV5 Series

## TYPICAL ELECTRICAL CHARACTERISTICS - NZQA6V8AXV5

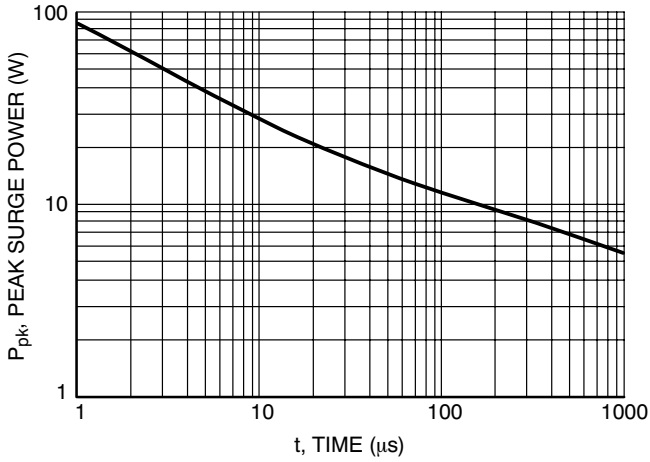


Figure 1. Pulse Width

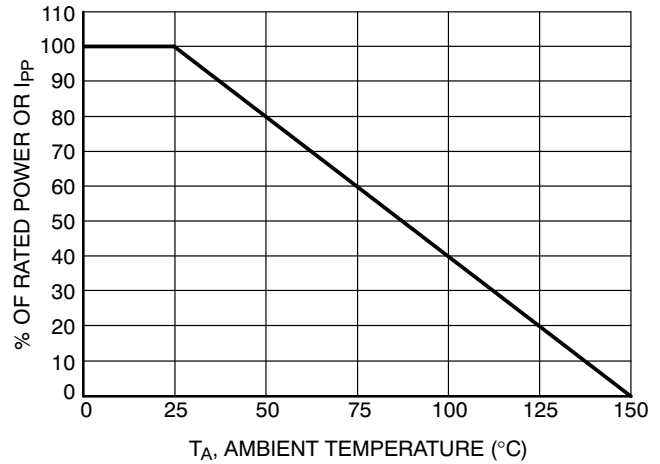


Figure 2. Power Derating Curve

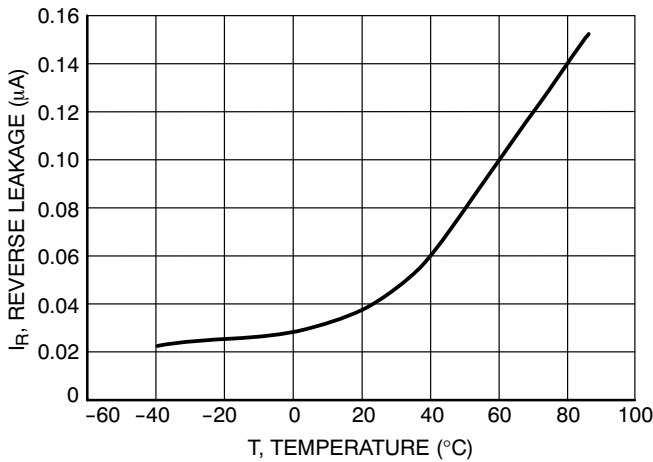


Figure 3. Reverse Leakage versus Temperature

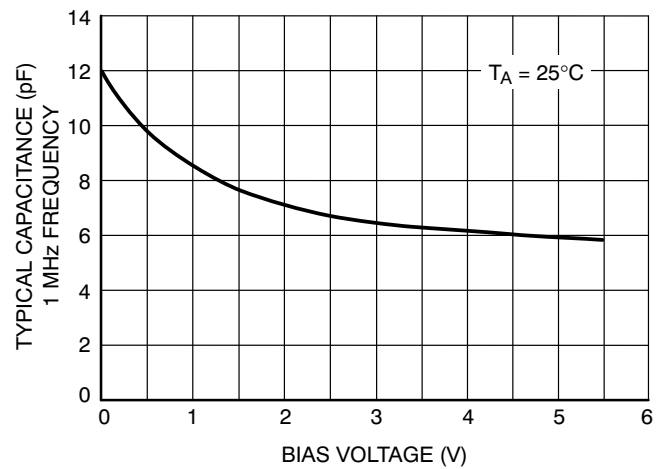


Figure 4. Capacitance

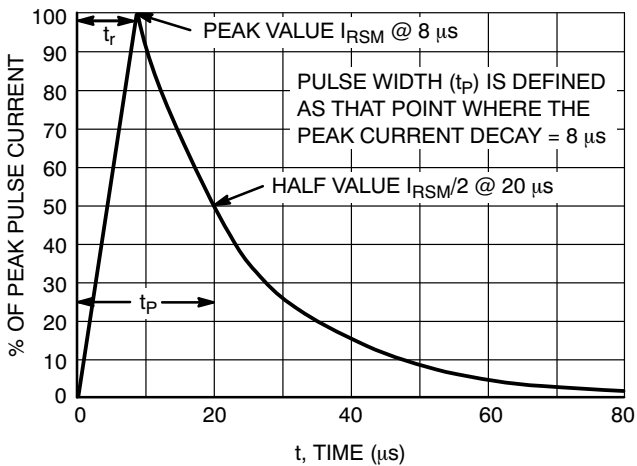


Figure 5.  $8 \times 20 \mu\text{s}$  Pulse Waveform

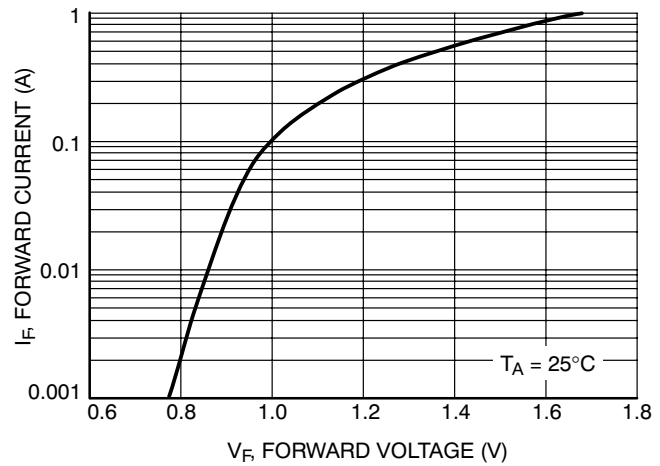
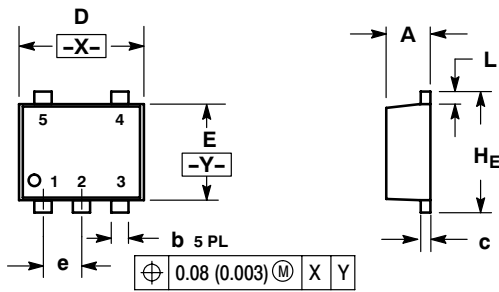


Figure 6. Forward Voltage

# NZQA5V6AXV5 Series

## PACKAGE DIMENSIONS

SOT-553, 5 LEAD  
CASE 463B-01  
ISSUE B



NOTES:

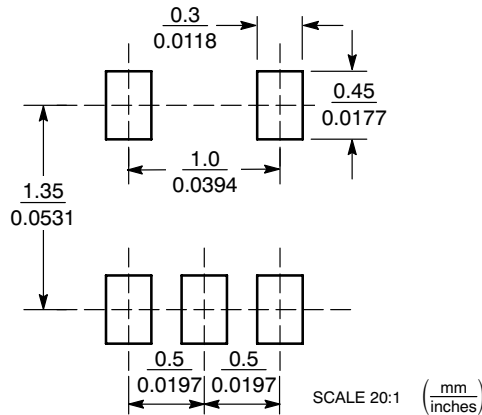
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
b	0.17	0.22	0.27	0.007	0.009	0.011
c	0.08	0.13	0.18	0.003	0.005	0.007
D	1.50	1.60	1.70	0.059	0.063	0.067
E	1.10	1.20	1.30	0.043	0.047	0.051
e	0.50 BSC			0.020 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
H <sub>E</sub>	1.50	1.60	1.70	0.059	0.063	0.067

STYLE 2:

- PIN 1. CATHODE
- COMMON ANODE
- CATHODE 2
- CATHODE 3
- CATHODE 4

### 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 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5773-3850

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)

**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative