

# NZQA5V6XV5T1G Series

## Quad Array for ESD Protection

This quad monolithic silicon voltage suppressor is designed for applications requiring transient overvoltage protection capability. It is intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment, and other applications. Its quad junction common anode design protects four separate lines using only one package. These devices are ideal for situations where board space is at a premium.

### Specification Features

- SOT-553 Package Allows Four Separate Unidirectional Configurations
- Low Leakage < 1  $\mu$ A @ 3 V for NZQA5V6XV5T1G
- Breakdown Voltage: 5.6 V – 6.8 V @ 1 mA
- ESD Protection Meeting IEC61000-4-2 – Level 4
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices

### Mechanical Characteristics

- Void Free, Transfer-Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- 100% Lead Free, MSL1 @ 260°C Reflow Temperature



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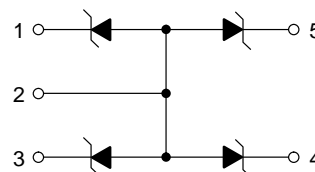


**SOT-553  
CASE 463B**

### MARKING DIAGRAM



xx = Specific Device Code  
M = Date Code  
■ = Pb-Free Package  
(Note: Microdot may be in either location)



### ORDERING INFORMATION

| Device        | Package           | Shipping†           |
|---------------|-------------------|---------------------|
| NZQA5V6XV5T1G | SOT-553 (Pb-Free) | 4000 / Tape & Reel  |
| NZQA5V6XV5T3G | SOT-553 (Pb-Free) | 16000 / Tape & Reel |
| NZQA6V2XV5T1G | SOT-553 (Pb-Free) | 4000 / Tape & Reel  |
| NZQA6V8XV5T1G | SOT-553 (Pb-Free) | 4000 / Tape & Reel  |
| SZQA6V8XV5T1G | SOT-553 (Pb-Free) | 4000 / Tape & Reel  |

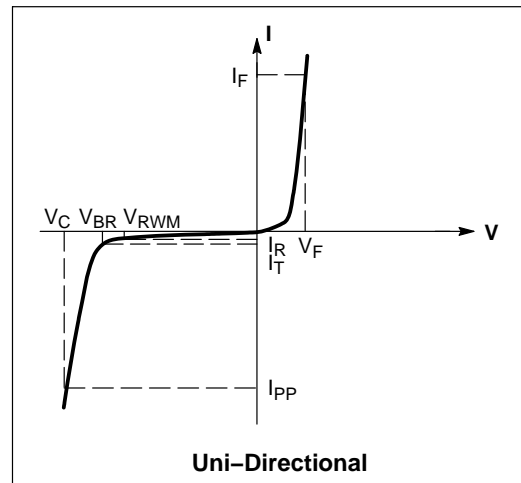
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

## NZQA5V6XV5T1G 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)                            | $P_{PK}$        | 100            | W  |
| Steady State Power – 1 Diode (Note 2)   | $P_D$           | 300            | mW   |
| Thermal Resistance Junction to Ambient<br>Above $25^\circ\text{C}$ , Derate                                   | $R_{\theta JA}$ | 370<br>2.7     | $^\circ\text{C/W}$<br>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    | $^\circ\text{C}$                           |
| ESD Discharge<br>MIL STD 883C – Method 3015-6<br>IEC1000-4-2, Air Discharge<br>IEC1000-4-2, Contact Discharge | $V_{PP}$        | 16<br>30<br>30 | kV   |
| Lead Solder Temperature (10 seconds duration)   | $T_L$           | 260            | $^\circ\text{C}$                           |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### 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 (Note 3) | Max $V_F$ @ $I_F = 200$ mA |
|---------------|----------------|---|-----|------|-------------------------------------|-----------------------------|----------------------|--------------|-------------------------------------|----------------------------|
|               |                | Min                                       | Nom | Max  | $V_{RWM}$                           | $I_{RWM}$ ( $\mu\text{A}$ ) | $V_C$ (V)            | $I_{PP}$ (A) | (pF)                                | (V)                        |
| NZQA5V6XV5T1G | 56             | 5.32                                      | 5.6 | 5.88 | 3.0                                 | 1.0                         | 10.5                 | 10           | 90                                  | 1.3                        |
| NZQA6V2XV5T1G | 62             | 5.89                                      | 6.2 | 6.51 | 4.0                                 | 0.5                         | 11.5                 | 9.0          | 80                                  | 1.3                        |
| NZQA6V8XV5T1G | 68             | 6.46                                      | 6.8 | 7.14 | 4.3                                 | 0.1                         | 12.5                 | 8.0          | 70                                  | 1.3                        |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

\*Includes SZ-prefix devices where applicable.

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,  $T_A = 25^\circ\text{C}$

# NZQA5V6XV5T1G Series

## TYPICAL CHARACTERISTICS

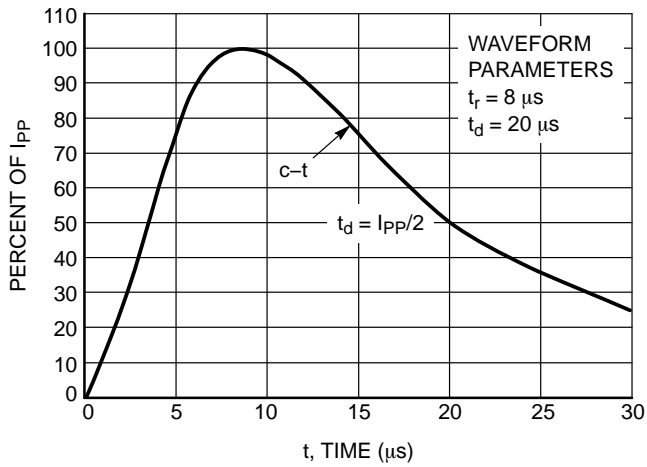


Figure 1. Pulse Waveform

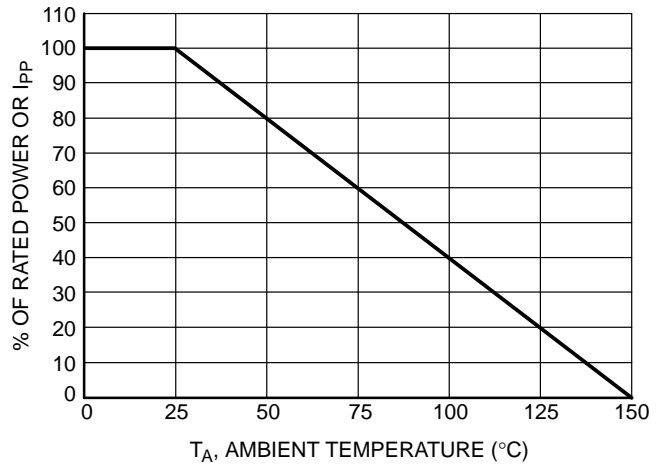


Figure 2. Power Derating Curve

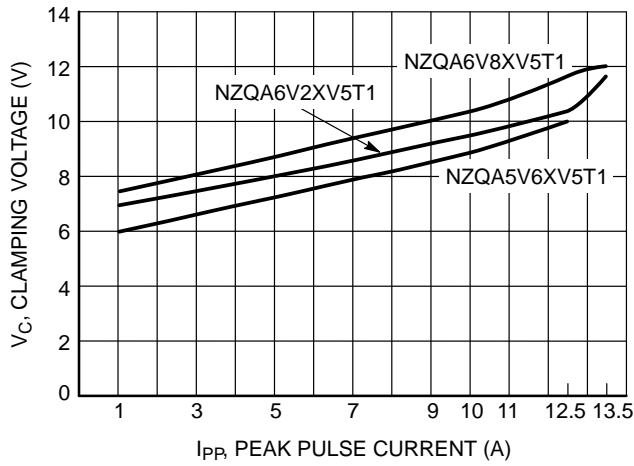


Figure 3. Clamping Voltage versus Peak Pulse Current

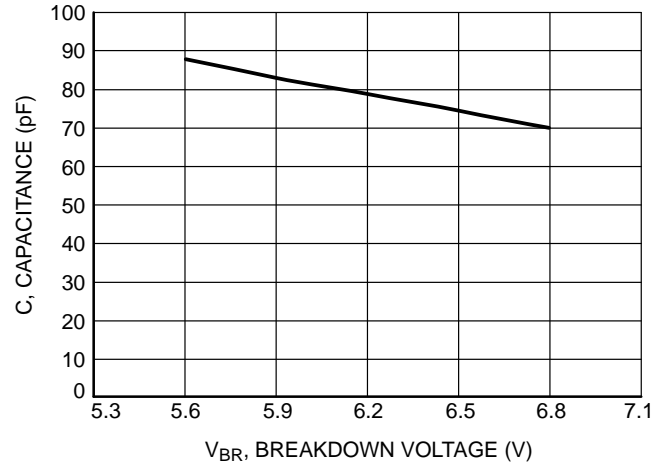


Figure 4. Typical Capacitance

# MECHANICAL CASE OUTLINE

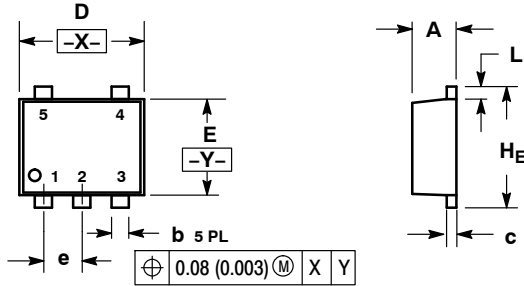
## PACKAGE DIMENSIONS



SCALE 4:1

SOT-553, 5 LEAD  
CASE 463B  
ISSUE C

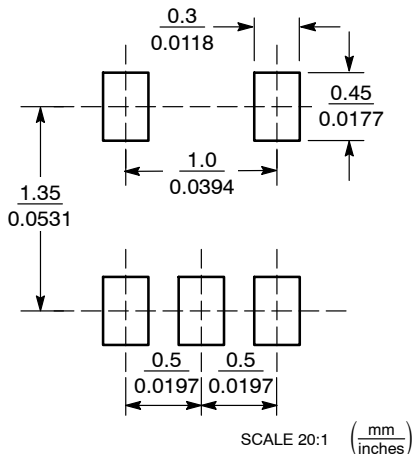
DATE 20 MAR 2013



- 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   | 1.55        | 1.60 | 1.65 | 0.061     | 0.063 | 0.065 |
| E   | 1.15        | 1.20 | 1.25 | 0.045     | 0.047 | 0.049 |
| e   | 0.50 BSC    |      |      | 0.020 BSC |       |       |
| L   | 0.10        | 0.20 | 0.30 | 0.004     | 0.008 | 0.012 |
| HE  | 1.55        | 1.60 | 1.65 | 0.061     | 0.063 | 0.065 |

### RECOMMENDED SOLDERING FOOTPRINT\*



### GENERIC MARKING DIAGRAM\*



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

- STYLE 1:  
PIN 1. BASE  
2. EMITTER  
3. BASE  
4. COLLECTOR  
5. COLLECTOR

- STYLE 2:  
PIN 1. CATHODE  
2. COMMON ANODE  
3. CATHODE 2  
4. CATHODE 3  
5. CATHODE 4

- STYLE 3:  
PIN 1. ANODE 1  
2. N/C  
3. ANODE 2  
4. CATHODE 2  
5. CATHODE 1

- STYLE 4:  
PIN 1. SOURCE 1  
2. DRAIN 1/2  
3. SOURCE 2  
4. GATE 1  
5. GATE 2

- STYLE 5:  
PIN 1. ANODE  
2. EMITTER  
3. BASE  
4. COLLECTOR  
5. CATHODE

- STYLE 6:  
PIN 1. EMITTER 2  
2. BASE 2  
3. EMITTER 1  
4. COLLECTOR 1  
5. COLLECTOR 2/BASE 1

- STYLE 7:  
PIN 1. BASE  
2. EMITTER  
3. BASE  
4. COLLECTOR  
5. COLLECTOR

- STYLE 8:  
PIN 1. CATHODE  
2. COLLECTOR  
3. N/C  
4. BASE  
5. EMITTER

- STYLE 9:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. ANODE  
5. ANODE

|                  |                 |  |
|------------------|-----------------|--|
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| DESCRIPTION:     | SOT-553, 5 LEAD | PAGE 1 OF 1  |

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