# NZL5V6AM3T5G Series

**Preferred Devices**

*Product Preview*

# Zener Voltage Regulators

## SOT−723 Dual Common Anode Zeners for ESD Protection

These dual monolithic silicon Zener diodes are designed for applications requiring ESD protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. Their dual junction common anode design protects two separate lines using only one package. These devices are ideal for situations where board space is at a premium.

**Specification Features:**

- SOT−723 Package Allows Either Two Separate Unidirectional Configurations or a Single Bidirectional Configuration
- Standard Zener Breakdown Voltage Ranges
- ESD Rating of Class N (exceeding 16 kV) per the Human Body Model and IEC61000−4−2 − Level 4
- Low Leakage < 5.0 μA
- These are Pb−Free Devices

**Mechanical Characteristics:**

**CASE:** Void-free, transfer-molded, thermosetting plastic Epoxy Meets UL 94, V−0
**LEAD FINISH:** 100% Matte Sn (Tin)
**MOUNTING POSITION:** Any
**QUALIFIED MAX REFLOW TEMPERATURE:** 260°C
Device Meets MSL 1 Requirements

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

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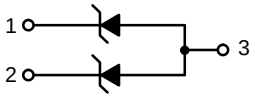
PIN 1. CATHODE
2. CATHODE
3. ANODE





**SOT−723**
**CASE 631AA**
**STYLE 4**

**MARKING DIAGRAM**


xx = Device Code
M = Date Code

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| NZL5V6AM3T5G | SOT−723 | 8000/Tape & Reel |
| NZL6V8AM3T5G | SOT−723 | 8000/Tape & Reel |
| NZL7V5AM3T5G | SOT−723 | 8000/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.

**DEVICE MARKING INFORMATION**

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

**Preferred** devices are recommended choices for future use and best overall value.

## MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Total Power Dissipation on FR−5 Board (Note 1) @ $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 240<br>1.9 | mW<br>mW/°C |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 525 | °C/W |
| Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | −55 to +150 | °C |
| Lead Solder Temperature − Maximum (10 Second Duration) | $T_L$ | 260 | °C |

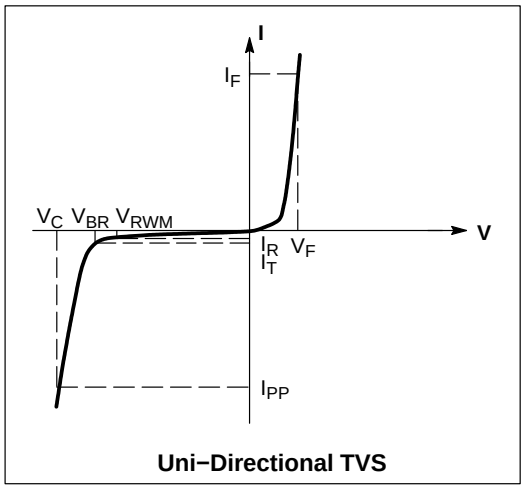
1. FR−5 board with minimum recommended mounting pad.
*Other voltages may be available upon request

## ELECTRICAL CHARACTERISTICS

($T_A$ = 25°C unless otherwise noted)

**UNIDIRECTIONAL** (Circuit tied to Pins 1 and 3 or 2 and 3)

| Symbol | Parameter |
|---|---|
| $V_{RWM}$ | 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 @ $I_{ZK}$ |



**Uni−Directional TVS**

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted, $V_F$ = 0.9 V Max @ $I_F$ = 10 mA for all types)

**UNIDIRECTIONAL** (Circuit tied to Pins 1 and 3 or Pins 2 and 3)

| Device | Device Marking | $V_{RWM}$ | $I_R$ @ $V_{RWM}$ | Breakdown Voltage | | | | Zener Impedance | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $V_{BR}$ (Note 2) (V) | | | @ $I_{ZT}$ | $Z_{ZT}$ @ $I_{ZT}$ | $Z_{ZK}$ @ $I_{ZK}$ | |
| | | Volts | μA | Min | Nom | Max | mA | Ω | Ω | mA |
| NZL5V6AM3T5G | L0 | 3.0 | 1.0 | 5.32 | 5.6 | 5.88 | 5.0 | 50 | 100 | 0.5 |
| NZL6V8AM3T5G | L2 | 4.0 | 0.1 | 6.46 | 6.8 | 7.14 | 5.0 | 30 | 100 | 0.5 |
| NZL7V5AM3T5G | L3 | 5.0 | 0.1 | 7.12 | 7.5 | 7.88 | 5.0 | 30 | 60 | 0.5 |

2. $V_{BR}$ measured at pulse test current $I_T$ at an ambient temperature of 25°C.
3. $Z_{ZT}$ and $Z_{ZK}$ are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)}$ = 0.1 $I_{Z(DC)}$, with the AC frequency = 1.0 kHz.

## TYPICAL CHARACTERISTICS

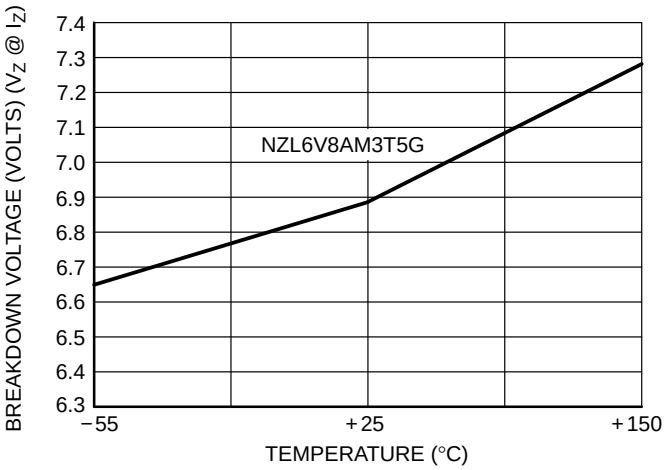



**Figure 1. Typical Breakdown Voltage versus Temperature**

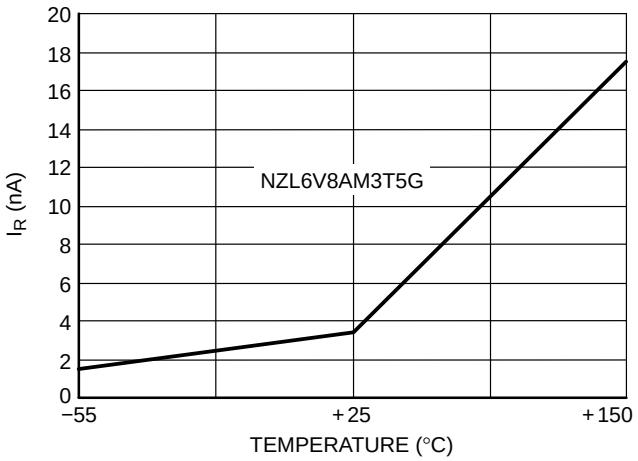



**Figure 2. Typical Leakage Current versus Temperature**

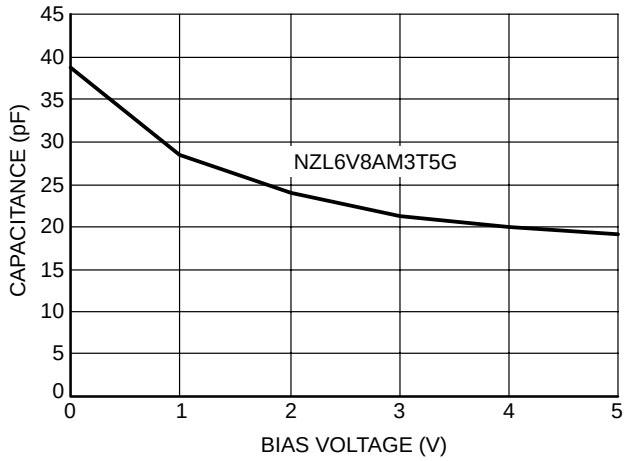



**Figure 3. Typical Capacitance versus Bias Voltage**

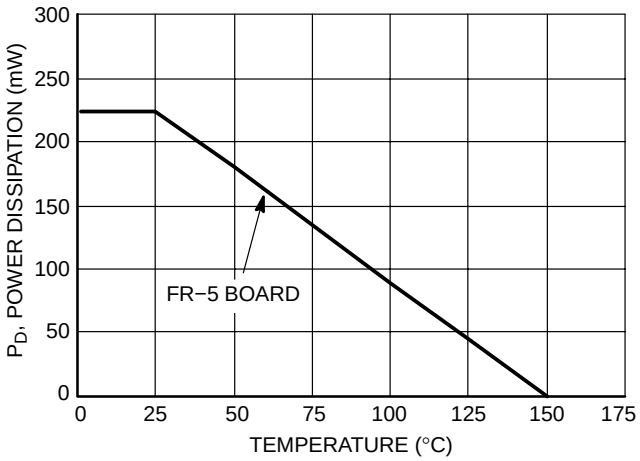



**Figure 4. Steady State Power Derating Curve**

## TYPICAL COMMON ANODE APPLICATIONS

A dual junction common anode design in an SOT−723 package protects two separate lines using only one package. This adds flexibility and creativity to PCB design especially when board space is at a premium. Two simplified examples of TVS applications are illustrated below.

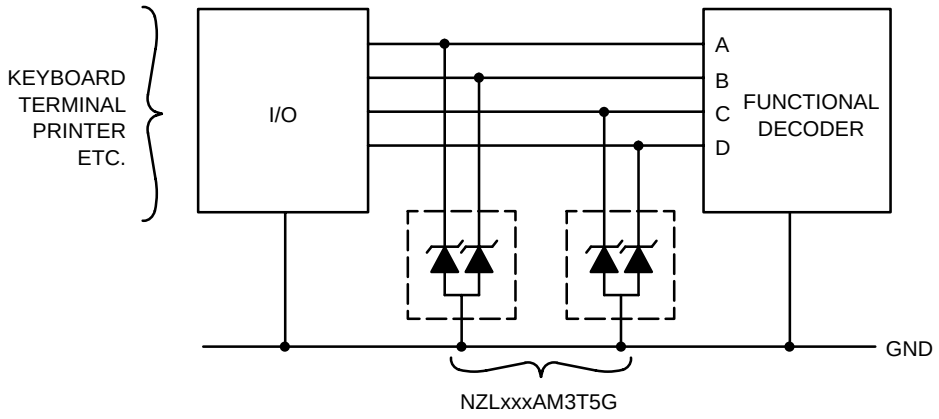



**Figure 5. Computer Interface Protection**

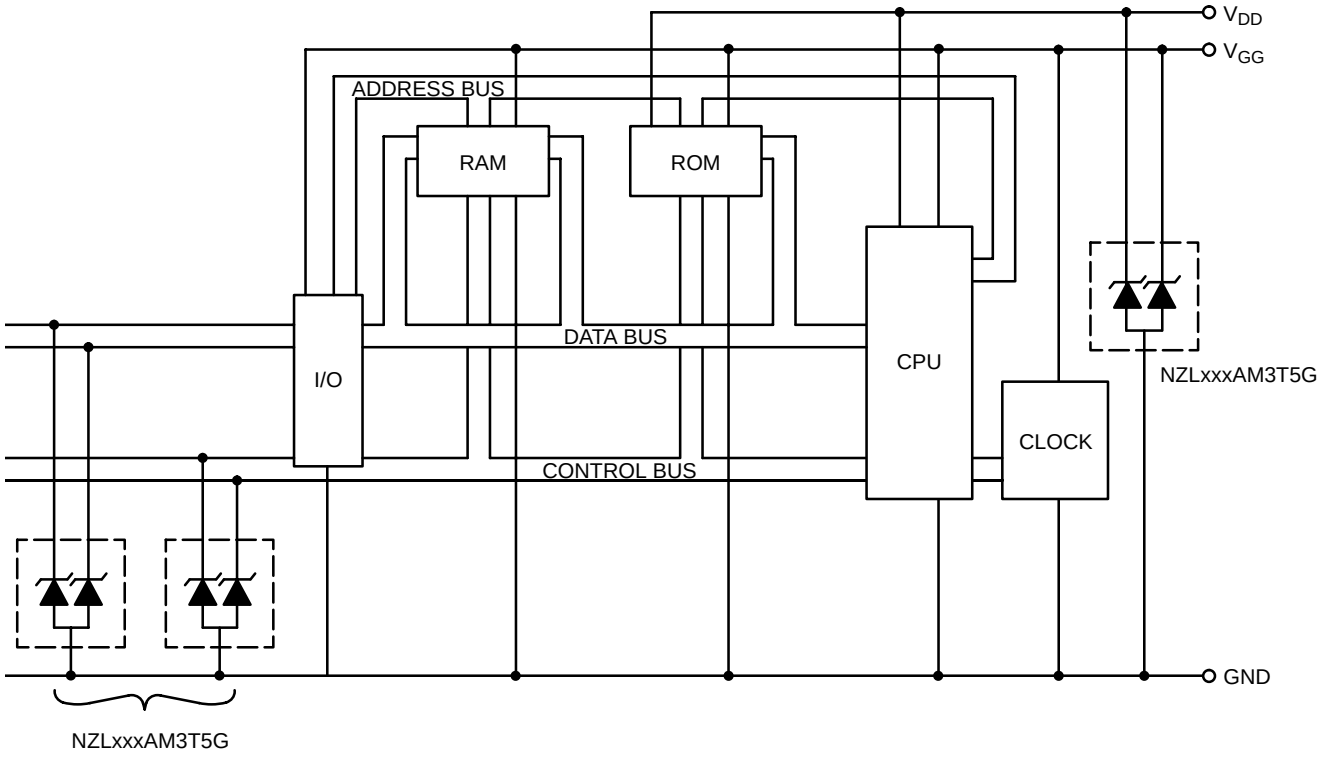
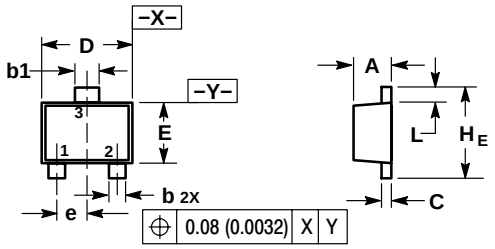



**Figure 6. Microprocessor Protection**

## PACKAGE DIMENSIONS

**SOT−723**
CASE 631AA−01
ISSUE A

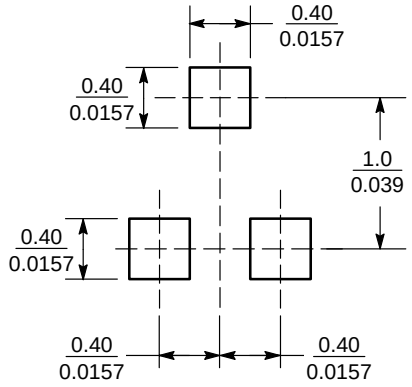



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| b | 0.15 | 0.20 | 0.27 | 0.0059 | 0.0079 | 0.0106 |
| b1 | 0.25 | 0.3 | 0.35 | 0.010 | 0.012 | 0.014 |
| C | 0.07 | 0.12 | 0.17 | 0.0028 | 0.0047 | 0.0067 |
| D | 1.15 | 1.20 | 1.25 | 0.045 | 0.047 | 0.049 |
| E | 0.75 | 0.80 | 0.85 | 0.03 | 0.032 | 0.034 |
| e | | 0.40 BSC | | | 0.016 BSC | |
| $H_E$ | 1.15 | 1.20 | 1.25 | 0.045 | 0.047 | 0.049 |
| L | 0.15 | 0.20 | 0.25 | 0.0059 | 0.0079 | 0.0098 |

STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE

## SOLDER FOOTPRINT*




SCALE 20:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

**SOT−723**

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

## PUBLICATION ORDERING INFORMATION

**LITERATURE FULFILLMENT**:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
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**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

**Japan**: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
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**ON Semiconductor Website**: http://onsemi.com

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