

Zener Voltage Regulators

200 mW Micro Packaged

NZD5V1MU Series

This Zener diode is designed to provide voltage regulation protection and is especially attractive in situations where space is at a premium. Because of its small size, it is suited for use in mobile applications.

Specification Features:

- Standard Zener Breakdown Voltage Range:
2.2 V to 9.1 V
- Steady State Power Rating of 200 mW
- Small Body Outline Dimensions:
0.60 mm x 0.30 mm
- Low Body Height: 0.30 mm
- ESD Rating of Class 3 (>8 kV) per Human Body Model
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Mechanical Characteristics:

MOUNTING POSITION: Any

QUALIFIED MAX REFLOW TEMPERATURE: 260°C

Device Meets MSL 1 Requirements

MAXIMUM RATINGS

| Rating | Symbol | Max | Unit |
|---|-----------------|----------------|---------------------------|
| Total Device Dissipation FR-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ | P_D | 200 | mW |
| Thermal Resistance from Junction-to-Ambient | $R_{\theta JA}$ | 400 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |
| Lead Solder Temperature – Maximum (10 Second Duration) | T_L | 260 | $^\circ\text{C}$ |

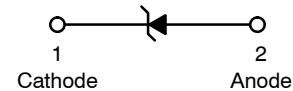
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-5 = 1.0 x 0.75 x 0.62 in.



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MARKING DIAGRAM



X3DFN2
CASE 152AF



X = Specific Device Code
M = Month Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|--------------------|------------------------|
| NZDxxxMUT5G | X3DFN (Pb-Free) | 10000 / 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 Electrical Characteristics tables starting on page 3 of this data sheet.

NZD5V1MU Series

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ unless otherwise noted,
 $V_F = 1.1\text{ V Max. @ } I_F = 10\text{ mA}$ for all types)

| Symbol | Parameter |
|--------------|---|
| V_Z | Reverse Zener Voltage @ I_{ZT} |
| I_{ZT} | Reverse Current |
| Z_{ZT} | Maximum Zener Impedance @ I_{ZT} |
| I_{ZK} | Reverse Current |
| Z_{ZK} | Maximum Zener Impedance @ I_{ZK} |
| I_R | Reverse Leakage Current @ V_R |
| V_R | Reverse Voltage |
| I_F | Forward Current |
| V_F | Forward Voltage @ I_F |
| ΘV_Z | Maximum Temperature Coefficient of V_Z |
| C | Max. Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$ |

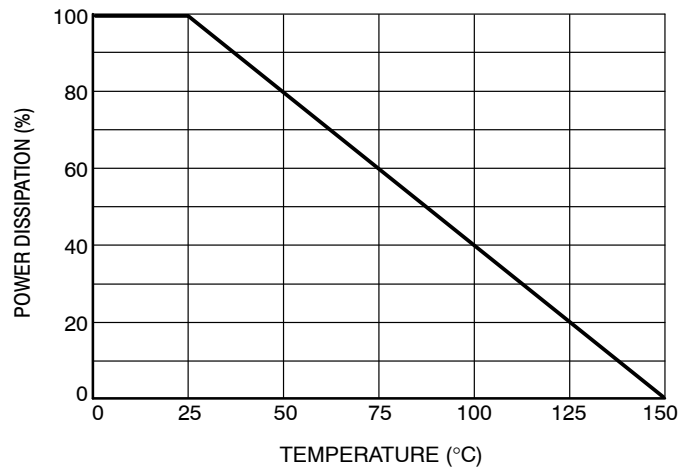
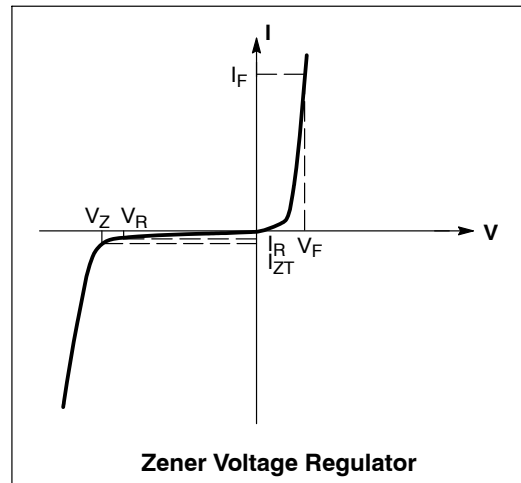


Figure 1. Steady State Power Derating

NZD5V1MU Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 1.1\text{ V Max.}$ @ $I_F = 10\text{ mA}$ for all types)

| Device | Device Marking | Zener Voltage (Note 1) | | | Zener Impedance | | | Leakage Current | | ΘV_Z (mV/k) @ I_{ZT} | | C @ $V_R = 0$ f = 1 MHz |
|-------------|----------------|---------------------------|------|------------|------------------------|---------------------|-----|-----------------|-------|-----------------------------------|------|-------------------------------|
| | | V_Z (Volts) | | @ I_{ZT} | Z_{ZT} @ I_{ZT} | Z_{ZK} @ I_{ZK} | | I_R @ V_R | | | | |
| | | Min | Max | mA | Ω | Ω | mA | μA | Volts | Min | Max | pF |
| NZD2V2MUT5G | K* | 2.08 | 2.30 | 4 | 100 | 1000 | 1 | 50 | 1 | -3.5 | 0 | 210 |
| NZD2V4MUT5G | D*** | 2.28 | 2.52 | 5 | 100 | 1000 | 1 | 50 | 1 | -3.5 | 0 | 210 |
| NZD2V7MUT5G | E*** | 2.57 | 2.84 | 5 | 100 | 1000 | 1 | 20 | 1 | -3.5 | 0 | 210 |
| NZD3V0MUT5G | Q* | 2.85 | 3.15 | 5 | 100 | 1000 | 1 | 10 | 1 | -3.5 | 0 | 210 |
| NZD3V3MUT5G | F*** | 3.14 | 3.47 | 5 | 100 | 1000 | 1 | 10 | 1 | -3.5 | 0 | 210 |
| NZD3V6MUT5G | J*** | 3.42 | 3.78 | 5 | 100 | 1000 | 1 | 10 | 1 | -3.5 | 0 | 210 |
| NZD3V9MUT5G | L | 3.71 | 4.10 | 5 | 100 | 1000 | 1 | 5 | 1 | -3.5 | -2.5 | 210 |
| NZD4V3MUT5G | D** | 4.09 | 4.52 | 5 | 100 | 1000 | 1 | 5 | 1 | -3.5 | 0 | 210 |
| NZD4V7MUT5G | P | 4.47 | 4.94 | 5 | 100 | 800 | 0.5 | 2 | 1 | -3.5 | 0.2 | 150 |
| NZD5V1MUT5G | Q | 4.85 | 5.36 | 5 | 80 | 500 | 0.5 | 2 | 1.5 | -2.7 | 1.2 | 130 |
| NZD5V6MUT5G | R | 5.32 | 5.88 | 5 | 60 | 200 | 0.5 | 1 | 2.5 | -2.0 | 2.5 | 115 |
| NZD6V2MUT5G | T | 5.89 | 6.51 | 5 | 60 | 100 | 0.5 | 1 | 3.0 | 0.4 | 3.7 | 110 |
| NZD6V8MUT5G | K*** | 6.46 | 7.14 | 5 | 40 | 60 | 0.5 | 0.5 | 3.5 | 1.2 | 4.5 | 105 |
| NZD7V5MUT5G | L*** | 7.13 | 7.88 | 5 | 30 | 60 | 0.5 | 0.5 | 4.0 | 2.5 | 5.3 | 100 |
| NZD8V2MUT5G | 2 | 7.79 | 8.61 | 5 | 30 | 60 | 0.5 | 0.5 | 5.0 | 3.2 | 6.2 | 90 |
| NZD9V1MUT5G | E** | 8.65 | 9.56 | 5 | 30 | 60 | 0.5 | 0.5 | 6.0 | 3.8 | 7.0 | 80 |

*Rotated 90° .

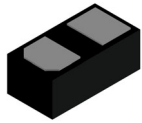
**Rotated 180° .

***Rotated 270° .

1. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C .

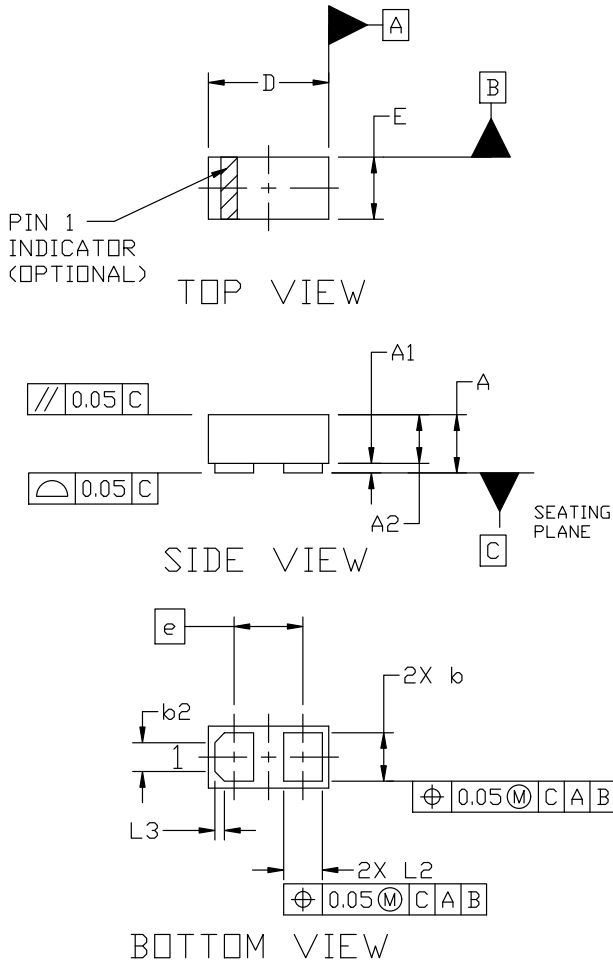
MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



X3DFN2 0.62x0.32x0.24, 0.35P
CASE 152AF
ISSUE C

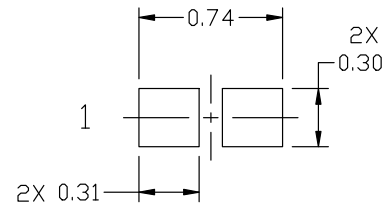
DATE 08 AUG 2023



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. 0201

| MILLIMETERS | | | |
|-------------|-----------|------|------|
| DIM | MIN. | NOM. | MAX. |
| A | 0.25 | 0.29 | 0.33 |
| A1 | 0.00 | --- | 0.05 |
| A2 | 0.14 | 0.24 | 0.34 |
| b | 0.22 | 0.25 | 0.28 |
| b2 | 0.150 REF | | |
| D | 0.58 | 0.62 | 0.66 |
| E | 0.28 | 0.32 | 0.36 |
| e | 0.355 BSC | | |
| L2 | 0.17 | 0.20 | 0.23 |
| L3 | 0.050 REF | | |



RECOMMENDED MOUNTING 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.

GENERIC MARKING DIAGRAM*



X = Specific Device Code
M = Date Code

*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.

| | | |
|-------------------------|-------------------------------------|--|
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| DESCRIPTION: | X3DFN2 0.62x0.32x0.24, 0.35P | PAGE 1 OF 1 |

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