

# 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	$^\circ\text{C}$

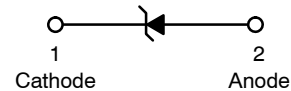
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

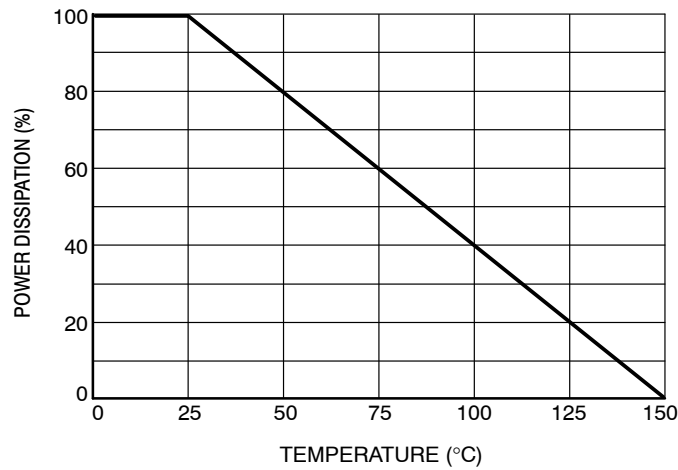
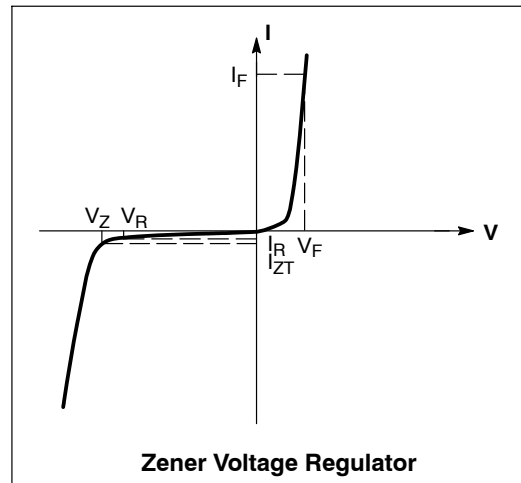
See specific marking information in the device marking column of the Electrical Characteristics tables starting on page 3 of this data sheet.

# 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 @ $I_F$
$\Theta V_Z$	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)

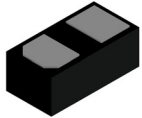
Device	Device Marking	Zener Voltage (Note 1)			Zener Impedance			Leakage Current		$\Theta V_Z$ (mV/k) @ $I_{ZT}$		C @ $V_R = 0$ f = 1 MHz
		$V_Z$ (Volts)		@ $I_{ZT}$	$Z_{ZT}$ @ $I_{ZT}$	$Z_{ZK}$ @ $I_{ZK}$		$I_R$ @ $V_R$				
		Min	Max	mA	$\Omega$	$\Omega$	mA	$\mu\text{A}$	Volts	Min	Max	pF
NZD2V2MUT5G	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  $90^\circ$ .

\*\*Rotated  $180^\circ$ .

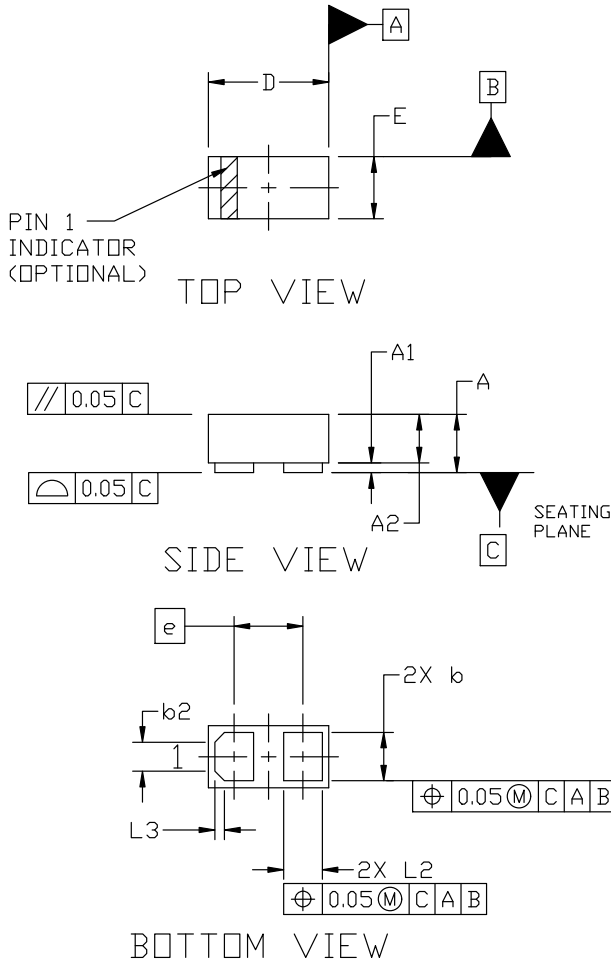
\*\*\*Rotated  $270^\circ$ .

1. Zener voltage is measured with a pulse test current  $I_Z$  at an ambient temperature of  $25^\circ\text{C}$ .



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

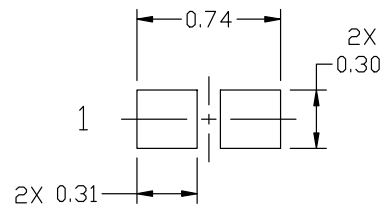
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NOTES:

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, "C" or microdot "\*", may or may not be present. Some products may not follow the Generic Marking.

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