

# NZ9F2V4ST5G SERIES

## Zener Voltage Regulators

### 200 mW SOD-923 Surface Mount

This series of Zener diodes is packaged in a SOD-923 surface mount package. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

#### Specification Features

- Standard Zener Breakdown Voltage Range -2.4 V to 18 V
- Steady State Power Rating of 200 mW
- Small Body Outline Dimensions:  
0.039" x 0.024" (1.00 mm x 0.60 mm)
- Low Body Height: 0.016" (0.40 mm)
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Tight Tolerance  $V_Z$
- 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

#### MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C	$P_D$	200 1.5	mW mW/°C
Thermal Resistance from Junction-to-Ambient	$R_{\theta JA}$	635	°C/W
Junction and Storage Temperature Range	$T_J, T_{stg}$	-65 to +150	°C

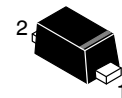
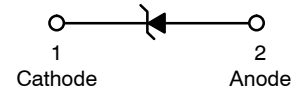
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-4 Minimum Pad.



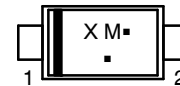
**ON Semiconductor®**

<http://onsemi.com>



**SOD-923  
CASE 514AB**

#### MARKING DIAGRAM



- X = Specific Device Code
  - M = Month Code
  - = Pb-Free Package
- (Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
NZ9FxxxST5G	SOD-923 (Pb-Free)	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 Electrical Characteristics table on page 3 of this data sheet.

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## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted,  
 $V_F = 0.9\text{ V Max. @ } I_F = 10\text{ mA}$  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 $f = 1\text{ MHz}$

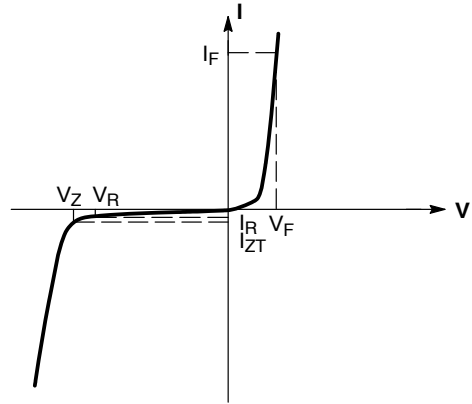


Figure 1. Zener Voltage Regulator

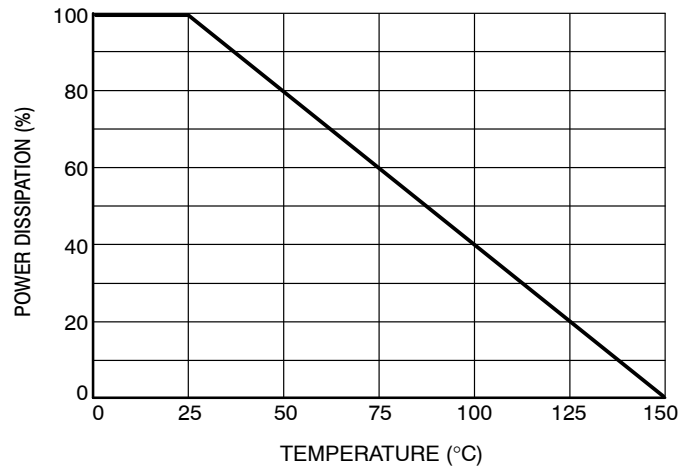


Figure 2. Steady State Power Derating

## NZ9F2V4ST5G SERIES

**ELECTRICAL CHARACTERISTICS** ( $V_F = 0.9 \text{ Max @ } I_F = 10 \text{ mA}$  for all types)

Device	Device Marking	Zener Voltage VZ		Test Current Izt mA	Z <sub>ZT</sub> I <sub>Z</sub> = I <sub>ZT</sub> @ 10% Mod Ω Max	Z <sub>ZK</sub> I <sub>Z</sub> = 1.0 mA Ω Max	I <sub>ZK</sub> mA	Max IR @ VR		dV <sub>Z</sub> /dt (mV/k) @ I <sub>ZT1</sub> = 5 mA		CpF Max @ V <sub>R</sub> = 0 f = 1 MHz
		Min	Max					μA	V	Min	Max	
NZ9F2V4ST5G	2*	2.43	2.63	5	100	1000	1	50	1	-3.5	0	210
NZ9F2V7ST5G	3*	2.67	2.91	5	100	1000	1	20	1	-3.5	0	210
NZ9F3V0ST5G	4*	2.94	3.26	5	100	1000	1	10	1	-3.5	0	210
NZ9F3V3ST5G	5*	3.32	3.53	5	100	1000	1	10	1	-3.5	0	210
NZ9F3V6ST5G	6*	3.6	3.85	5	100	1000	1	10	1	-3.5	0	210
NZ9F3V9ST5G	A**	3.89	4.16	5	100	1000	1	5	1	-3.5	-2.5	210
NZ9F4V3ST5G	D**	4.17	4.43	5	100	1000	1	5	1	-3.5	0	210
NZ9F4V7ST5G	E**	4.55	4.75	5	100	800	0.5	2	1	-3.5	0.2	150
NZ9F5V1ST5G	F**	4.989	5.2	5	80	500	0.5	2	1.5	-2.7	1.2	130
NZ9F5V6ST5G	J**	5.49	5.73	5	60	200	0.5	1	2.5	-2.0	2.5	115
NZ9F6V2ST5G	K**	6.06	6.33	5	60	100	0.5	1	3	0.4	3.7	110
NZ9F6V8ST5G	L**	6.65	6.93	5	40	60	0.5	0.5	3.5	1.2	4.5	105
NZ9F7V5ST5G	P**	7.28	7.6	5	30	60	0.5	0.5	4	2.5	5.3	100
NZ9F8V2ST5G	Q**	8.02	8.36	5	30	60	0.5	0.5	5	3.2	6.2	90
NZ9F9V1ST5G	R**	8.85	9.23	5	30	60	0.5	0.5	6	3.8	7	80
NZ9F10VST5G	T**	9.77	10.21	5	30	60	0.5	0.1	7	4.5	8	80
NZ9F11VST5G	V**	10.76	11.22	5	30	60	0.5	0.1	8	5.4	9	80
NZ9F12VST5G	Y**	11.74	12.24	5	30	80	0.5	0.1	9	6	10	80
NZ9F13VST5G	2**	12.91	13.49	5	37	80	0.5	0.1	10	7	11	75
NZ9F15VST5G	3**	14.34	14.98	5	42	80	0.5	0.1	11	9.2	13	70
NZ9F16VST5G	4**	15.85	16.51	5	50	80	0.5	0.1	12	10.4	14	65
NZ9F18VST5G	5**	17.56	18.35	5	50	80	0.5	0.1	14	12.4	16	60

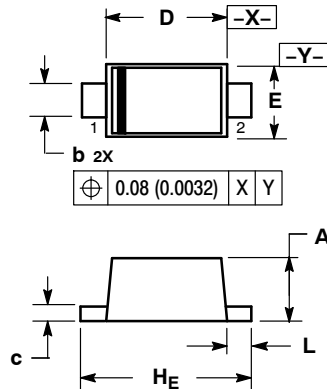
\*Rotated 90°.

\*\*Rotated 180°.

# NZ9F2V4ST5G SERIES

## PACKAGE DIMENSIONS

SOD-923  
CASE 514AB-01  
ISSUE B

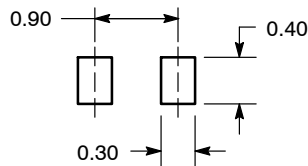


### NOTES:

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	0.34	0.37	0.40	0.013	0.015	0.016
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.07	0.12	0.17	0.003	0.005	0.007
D	0.75	0.80	0.85	0.030	0.031	0.033
E	0.55	0.60	0.65	0.022	0.024	0.026
H <sub>E</sub>	0.95	1.00	1.05	0.037	0.039	0.041
L	0.05	0.10	0.15	0.002	0.004	0.006

### SOLDERING FOOTPRINT\*



DIMENSIONS: MILLIMETERS

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

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