

NZ9F2V4ST5G, SZNZ9F2V4ST5G 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
- 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

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	250 2.0	mW mW/°C
Thermal Resistance from Junction-to-Ambient	$R_{\theta JA}$	500	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	-65 to +150	°C

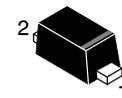
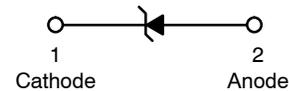
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-4 Minimum Pad.



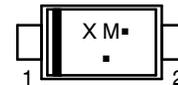
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**SOD-923
CASE 514AB**

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, SZNZ9FxxxST5G	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
ΘV_Z	Maximum Temperature Coefficient of V_Z
C	Max. Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$

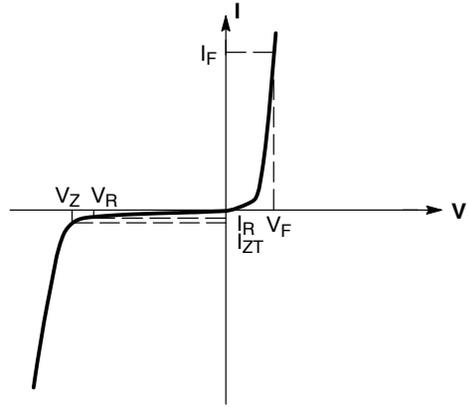


Figure 1. Zener Voltage Regulator

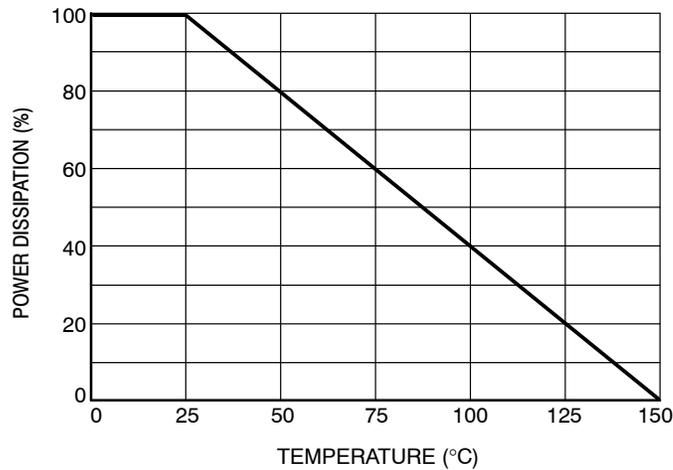


Figure 2. Steady State Power Derating

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ELECTRICAL CHARACTERISTICS ($V_F = 0.9$ Max @ $I_F = 10$ mA for all types)

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

*Rotated 90°.

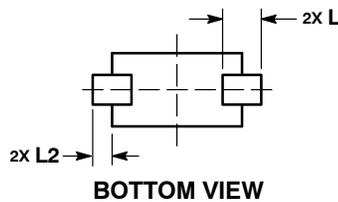
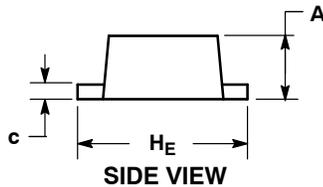
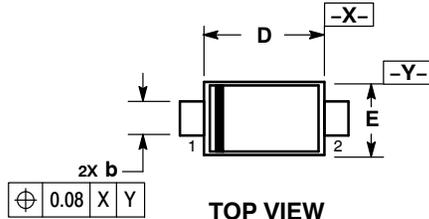
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***SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

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PACKAGE DIMENSIONS

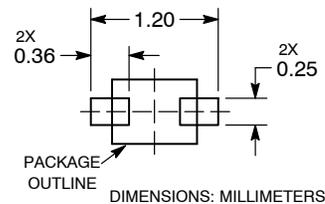
SOD-923
CASE 514AB
ISSUE C



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 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.

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 _E	0.95	1.00	1.05	0.037	0.039	0.041
L	0.19 REF			0.007 REF		
L2	0.05	0.10	0.15	0.002	0.004	0.006

SOLDERING FOOTPRINT*



See Application Note AND8455/D for more mounting details

*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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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9