MM3Z2V4ST1 SERIES

Zener Voltage Regulators

200 mW SOD−323 Surface Mount

Tight Tolerance Portfolio

This series of Zener diodes is packaged in a SOD−323 surface mount package that has a power dissipation of 200 mW. 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: 0.067″ x 0.049″ (1.7 mm x 1.25 mm)
- Low Body Height: 0.035″ (0.9 mm)
- Package Weight: 4.507 mg/unit
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Tight Tolerance V_Z
- Pb−Free Packages are Available

Mechanical Characteristics:

CASE: Void-free, transfer-molded plastic
FINISH: All external surfaces are corrosion resistant
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds
LEADS: Plated with Pb−Sn or Sn only (Pb−Free)
POLARITY: Cathode indicated by polarity band
FLAMMABILITY RATING: UL 94 V−0
MOUNTING POSITION: Any

MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Total Device Dissipation FR−5 Board, (Note 1) @ T_A = 25°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.

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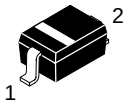


SOD−323
CASE 477
STYLE 1

MARKING DIAGRAM

XX = Specific Device Code
M = Date Code*
▪ = Pb−Free Package
(Note: Microdot may be in either location)
*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
MM3ZxxxST1	SOD−323	3000/Tape & Reel
MM3ZxxxST1G	SOD−323 (Pb−Free)	3000/Tape & Reel
MM3ZxxxST3	SOD−323	10,000/Tape & Reel
MM3ZxxxST3G	SOD−323 (Pb−Free)	10,000/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.

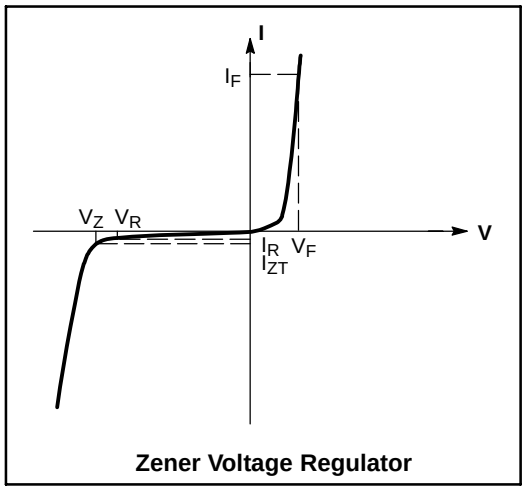
DEVICE MARKING INFORMATION

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

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted,
V_F = 0.9 V Max. @ I_F = 10 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 MHz



Zener Voltage Regulator

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

Device*	Device Marking	Test Current Izt mA	Zener Voltage VZ		Z_{ZK} I_Z = 0.5 mA Ω Max	Z_{ZT} I_Z = IZT @ 10% Mod Ω Max	Max IR @ VR		d_{VZ}/dt (mV/k) @ I_{ZT1} = 5 mA		C pF Max @ V_R = 0 f = 1 MHz
			Min	Max			μA	V	Min	Max	
MM3Z3V3ST1, G	T5	5.0	3.32	3.53	1000	95	5.0	1.0	−3.5	0	450
MM3Z3V9ST1, G	T7	5.0	3.89	4.16	1000	90	3.0	1.0	−3.5	−2.5	450
MM3Z4V3ST1, G	T8	5.0	4.17	4.43	1000	90	3.0	1.0	−3.5	0	450
MM3Z4V7ST1, G	T9	5.0	4.55	4.75	800	80	3.0	2.0	−3.5	0.2	260
MM3Z5V1ST1, G	TA	5.0	4.98	5.2	500	60	2.0	2.0	−2.7	1.2	225
MM3Z5V6ST1, G	TC	5.0	5.49	5.73	200	40	1.0	2.0	−2.0	2.5	200
MM3Z6V2ST1, G	TE	5.0	6.06	6.33	100	10	3.0	4.0	0.4	3.7	185
MM3Z6V8ST1, G	TF	5.0	6.65	6.93	160	15	2.0	4.0	1.2	4.5	155
MM3Z7V5ST1, G	TG	5.0	7.28	7.6	160	15	1.0	5.0	2.5	5.3	140
MM3Z8V2ST1, G	TH	5.0	8.02	8.36	160	15	0.7	5.0	3.2	6.2	1358
MM3Z9V1ST1, G	TK	5.0	8.85	9.23	160	15	0.5	6.0	3.8	7.0	130
MM3Z10VST1, G	WB	5.0	9.80	10.20	160	15	0.5	6.0	4.5	8.0	130
MM3Z12VST1, G	TN	5.0	11.74	12.24	80	25	0.1	8.0	6.0	10	130
MM3Z15VST1, G	TP	5.0	14.34	14.98	80	40	0.1	11	8.8	12.7	130
MM3Z16VST1, G	TU	5.0	15.85	16.51	80	40	0.05	11.2	10.4	14	105
MM3Z18VST1, G	TW	5.0	17.56	18.35	80	45	0.05	12.6	12.4	16	100

*The “G’’ suffix indicates Pb−Free package available.

TYPICAL CHARACTERISTICS

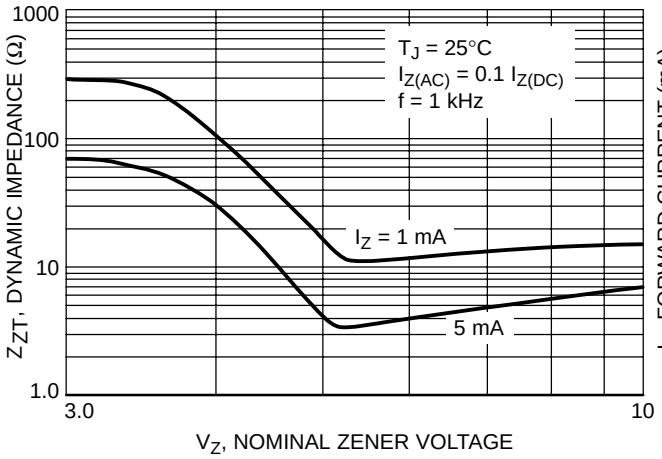


Figure 1. Effect of Zener Voltage on Zener Impedance

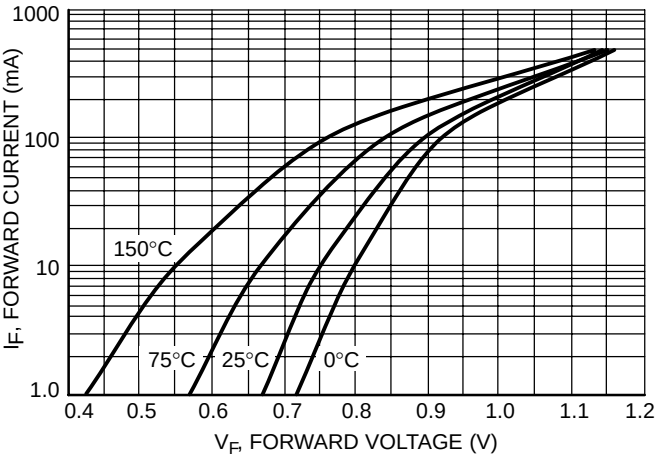


Figure 2. Typical Forward Voltage

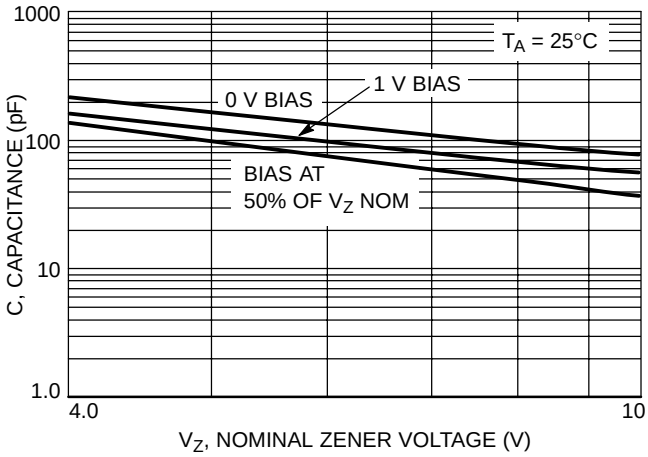


Figure 3. Typical Capacitance

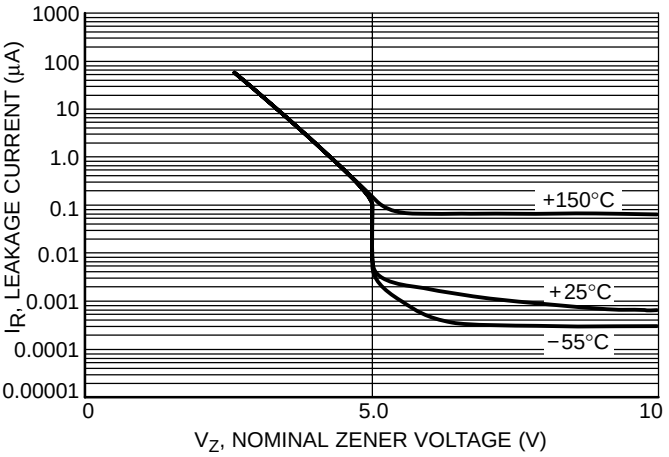


Figure 4. Typical Leakage Current

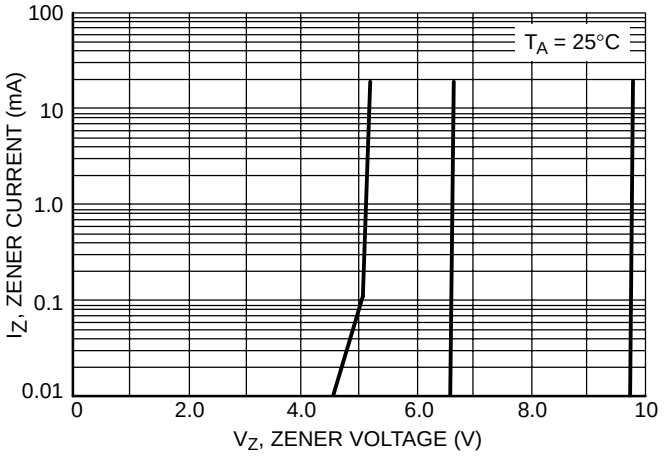


Figure 5. Zener Voltage versus Zener Current (V_Z Up to 9 V)

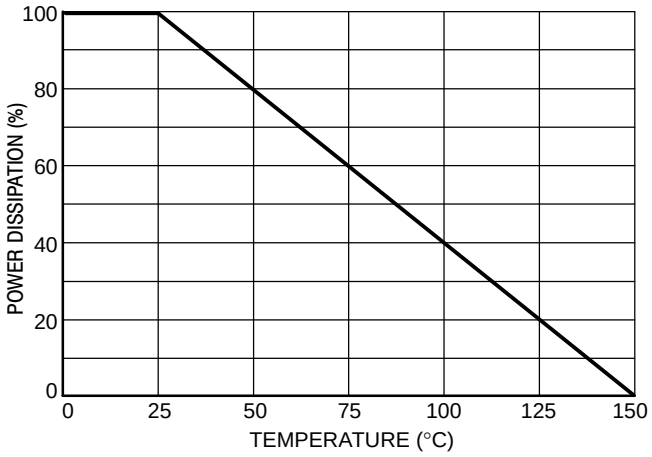
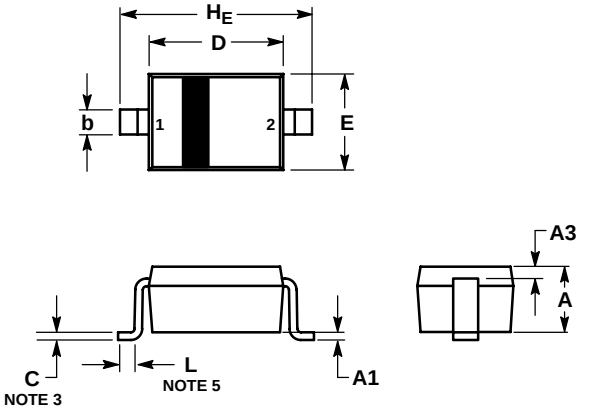


Figure 6. Steady State Power Derating

MM3Z2V4ST1 SERIES

PACKAGE DIMENSIONS

SOD−323
CASE 477−02
ISSUE G

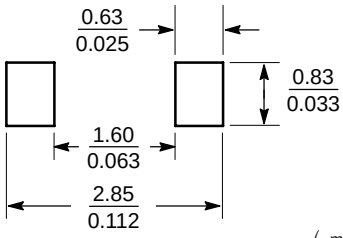


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

	MILLIMETERS			INCHES		
DIM	**MIN**	**NOM**	**MAX**	**MIN**	**NOM**	**MAX**
A	0.80	0.90	1.00	0.031	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.15 REF			0.006 REF		
b	0.25	0.32	0.4	0.010	0.012	0.016
C	0.089	0.12	0.177	0.003	0.005	0.007
D	1.60	1.70	1.80	0.062	0.066	0.070
E	1.15	1.25	1.35	0.045	0.049	0.053
L	0.08			0.003		
H_E	2.30	2.50	2.70	0.090	0.098	0.105

STYLE 1:
PIN 1. CATHODE
2. ANODE

SOLDERING FOOTPRINT*



SCALE 10:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
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
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
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Order Literature: http://www.onsemi.com/orderlit

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