Zener Voltage Regulators

500 mW SOD-323 Surface Mount

MM3ZxxxT1G Series, SZMM3ZxxxT1G Series

This series of Zener diodes is packaged in a SOD-323 surface mount package that has a power dissipation of 500 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 75 V
- Steady State Power Rating of 500 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
- 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 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

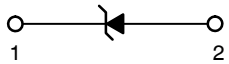
Rating	Symbol	Max	Unit
Total Device Dissipation FR-4 Board, (Note 1) @ T_A = 25 °C Derate above 25 °C (Note 2) @ T_A = 25 °C Derate above 25 °C	P_D	 300 2.4 500 4.0	 mW mW/°C mW mW/°C
Thermal Resistance from Junction-to-Ambient (Note 1) (Note 2)	$R_{\theta JA}$	 416 250	 °C/W °C/W
Junction and Storage Temperature Range	T_J, T_{stg}	–65 to +150	°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.

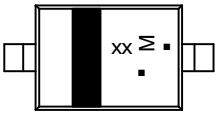
1. FR-4 printed circuit board, single-sided copper, mounting pad 1 cm^2.
2. FR-4 printed circuit board, single-sided copper, mounting pad = 0.72 mm^2, 1 $inch^2$ Copper Heat Sink



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†
MM3ZxxxT1G, SZMM3ZxxxT1G	SOD-323 (Pb-Free)	3,000 / Tape & Reel
MM3ZxxxT3G, SZMM3ZxxxT3G	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

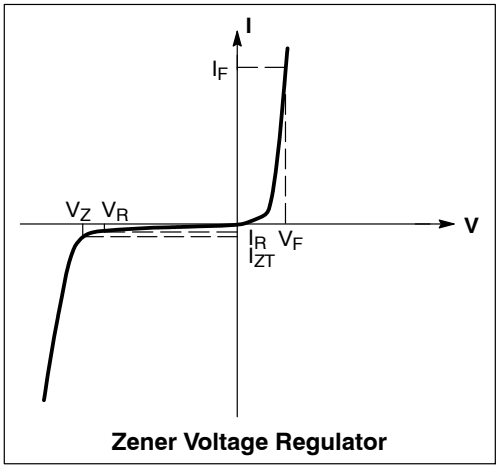
See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

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

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ELECTRICAL CHARACTERISTICS

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

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted, V_F = 0.9 V Max. @ I_F = 10 mA for all types)

Device*	Device Marking	Zener Voltage (Note 3) V_Z (Volts) Min	Nom	Max	@ I_{ZT} mA	Zener Impedance Z_{ZT} @ I_{ZT} Ω	Z_{ZK} @ I_{ZK} Ω	I_{ZK} mA	Leakage Current I_R @ V_R µA	Volts	ΘV_Z (mV/k) @ I_{ZT} Min	Max	C @ V_R = 0 f = 1 MHz pF
MM3Z2V4T1G	00	2.2	2.4	2.6	5	100	1000	0.5	50	1.0	–3.5	0	450
MM3Z2V7T1G	01	2.5	2.7	2.9	5	100	1000	0.5	20	1.0	–3.5	0	450
MM3Z3V0T1G	02	2.8	3.0	3.2	5	100	1000	0.5	10	1.0	–3.5	0	450
MM3Z3V3T1G	05	3.1	3.3	3.5	5	95	1000	0.5	5	1.0	–3.5	0	450
MM3Z3V6T1G	06	3.4	3.6	3.8	5	90	1000	0.5	5	1.0	–3.5	0	450
MM3Z3V9T1G	07	3.7	3.9	4.1	5	90	1000	0.5	3	1.0	–3.5	–2.5	450
MM3Z4V3T1G	08	4.0	4.3	4.6	5	90	1000	0.5	3	1.0	–3.5	0	450
SZMM3Z4V3T1G	X9	4.0	4.3	4.6	5	90	1000	0.5	3	1.0	–3.5	0	450
MM3Z4V7T1G	09	4.4	4.7	5.0	5	80	800	0.5	3	2.0	–3.5	0.2	260
MM3Z5V1T1G	0A	4.8	5.1	5.4	5	60	500	0.5	2	2.0	–2.7	1.2	225
MM3Z5V6T1G	0C	5.2	5.6	6.0	5	40	200	0.5	1	2.0	–2.0	2.5	200
MM3Z6V2T1G	0E	5.8	6.2	6.6	5	10	100	0.5	3	4.0	0.4	3.7	185
MM3Z6V8T1G	0F	6.4	6.8	7.2	5	15	160	0.5	2	4.0	1.2	4.5	155
MM3Z7V5T1G	0G	7.0	7.5	7.9	5	15	160	0.5	1	5.0	2.5	5.3	140
MM3Z8V2T1G	0H	7.7	8.2	8.7	5	15	160	0.5	0.7	5.0	3.2	6.2	135
MM3Z9V1T1G	0K	8.5	9.1	9.6	5	15	160	0.5	0.2	7.0	3.8	7.0	130
MM3Z10VT1G	0L	9.4	10	10.6	5	20	160	0.5	0.1	8.0	4.5	8.0	130
MM3Z11VT1G	0M	10.4	11	11.6	5	20	160	0.5	0.1	8.0	5.4	9.0	130
MM3Z12VT1G	0N	11.4	12	12.7	5	25	80	0.5	0.1	8.0	6.0	10	130
MM3Z13VT1G	0P	12.4	13.25	14.1	5	30	80	0.5	0.1	8.0	7.0	11	120
MM3Z15VT1G	0T	14.3	15	15.8	5	30	80	0.5	0.05	10.5	9.2	13	110
MM3Z16VT1G	0U	15.3	16.2	17.1	5	40	80	0.5	0.05	11.2	10.4	14	105
MM3Z18VT1G	0W	16.8	18	19.1	5	45	80	0.5	0.05	12.6	12.4	16	100
MM3Z20VT1G	0Z	18.8	20	21.2	5	55	100	0.5	0.05	14.0	14.4	18	85
MM3Z22VT1G	10	20.8	22	23.3	5	55	100	0.5	0.05	15.4	16.4	20	85
MM3Z24VT1G	11	22.8	24.2	25.6	5	70	120	0.5	0.05	16.8	18.4	22	80
MM3Z27VT1G	12	25.1	27	28.9	2	80	300	0.5	0.05	18.9	21.4	25.3	70
MM3Z30VT1G	14	28	30	32	2	80	300	0.5	0.05	21.0	24.4	29.4	70
MM3Z33VT1G	18	31	33	35	2	80	300	0.5	0.05	23.2	27.4	33.4	70
MM3Z36VT1G	19	34	36	38	2	90	500	0.5	0.05	25.2	30.4	37.4	70
MM3Z39VT1G	20	37	39	41	2	130	500	0.5	0.05	27.3	33.4	41.2	45
MM3Z43VT1G	21	40	43	46	2	150	500	0.5	0.05	30.1	37.6	46.6	40
MM3Z47VT1G	1A	44	47	50	2	170	500	0.5	0.05	32.9	42.0	51.8	40
MM3Z51VT1G	1C	48	51	54	2	180	500	0.5	0.05	35.7	46.6	57.2	40
MM3Z56VT1G	1D	52	56	60	2	200	500	0.5	0.05	39.2	52.2	63.8	40
MM3Z62VT1G	2A	58	62	66	2	215	500	0.5	0.05	43.4	58.9	71.8	35
MM3Z68VT1G	1F	64	68	72	2	240	500	0.5	0.05	47.6	65.6	79.8	35
MM3Z75VT1G	1G	70	75	79	2	255	500	0.5	0.05	52.5	73.4	88.6	35

*Includes SZ-prefix devices where applicable.

3. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25 °C.
4. Marking for the Standard part is identical to its Automotive OPN unless noted otherwise.

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TYPICAL CHARACTERISTICS

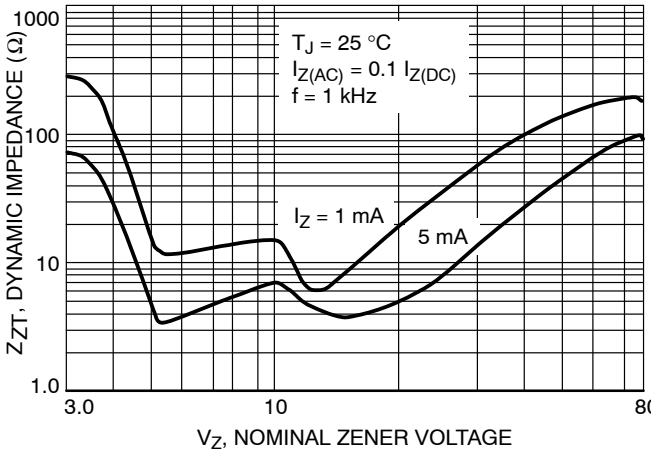


Figure 1. Effect of Zener Voltage on Zener Impedance

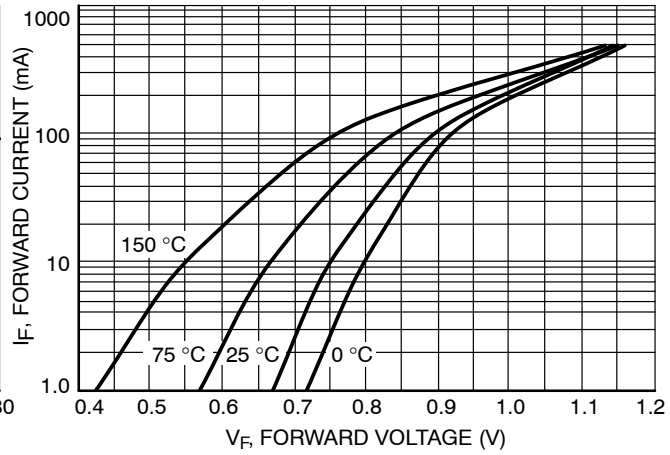


Figure 2. Typical Forward Voltage

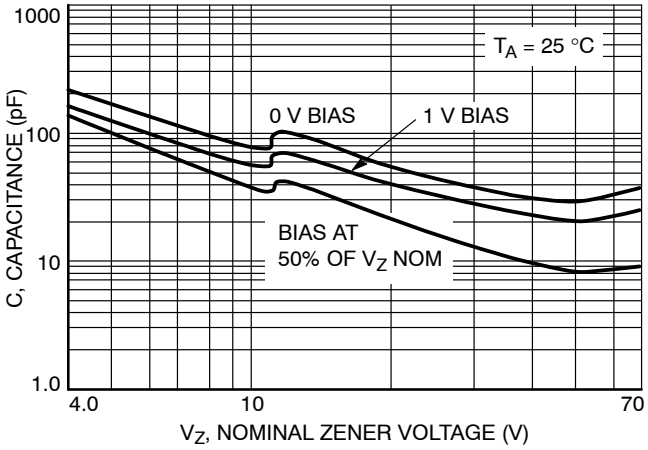


Figure 3. Typical Capacitance

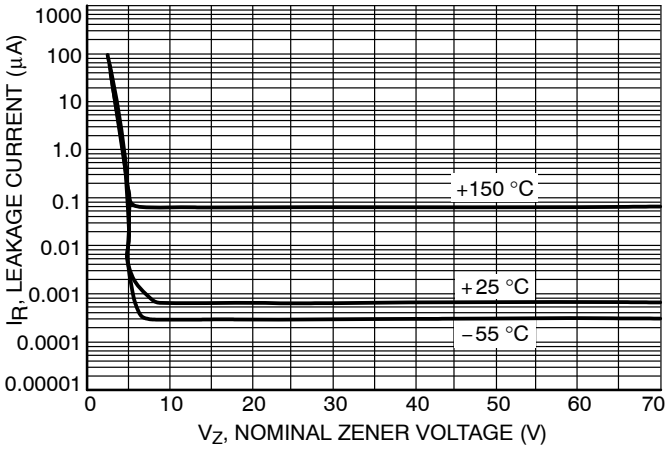


Figure 4. Typical Leakage Current

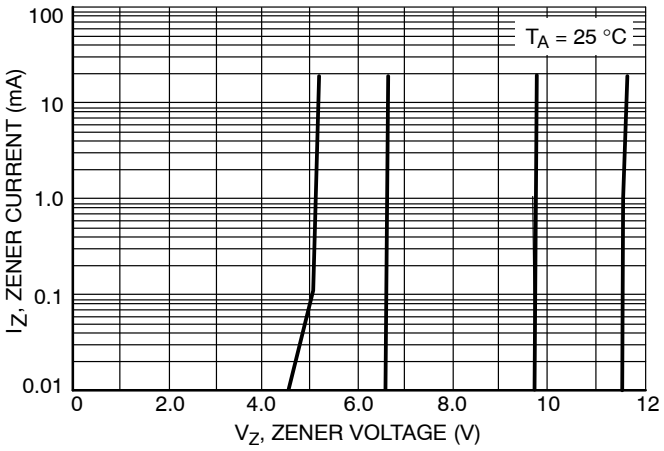


Figure 5. Zener Voltage versus Zener Current (V_Z Up to 12 V)

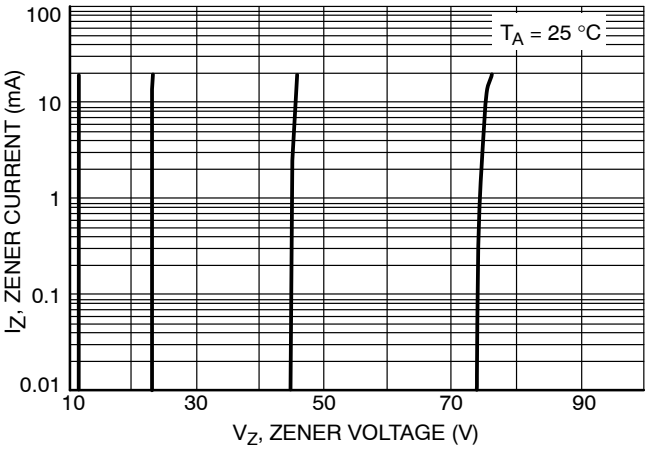


Figure 6. Zener Voltage versus Zener Current (12 V to 75 V)

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TYPICAL CHARACTERISTICS

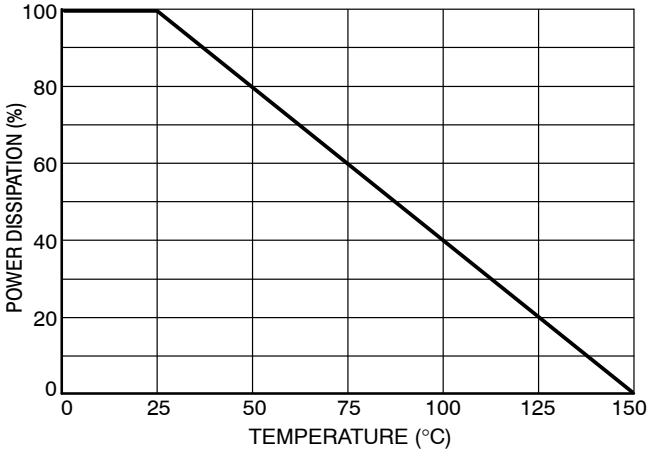


Figure 7. Steady State Power Derating

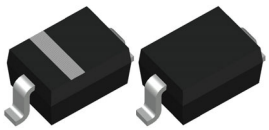
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REVISION HISTORY

Revision	Description of Changes	Date
15	Add a new OPN and note	2/10/2026

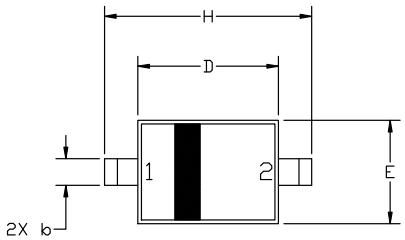
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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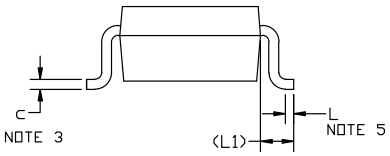


SOD−323 1.70x1.25x0.85
CASE 477
ISSUE K

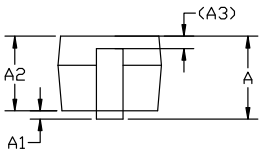
DATE 11 MAR 2024



TOP VIEW



SIDE VIEW

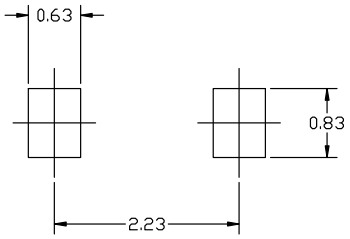


END VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
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 MEASURE FROM END OF RADIUS.

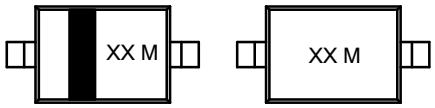
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.90	1.00
A1	0.00	0.05	0.10
A2	0.75	0.85	0.95
A3	0.15 (REF)		
b	0.25	0.32	0.4
c	0.09	0.12	0.18
D	1.60	1.70	1.80
E	1.15	1.25	1.35
H	2.30	2.50	2.70
L	0.08	---	---
L1	0.40 (REF)		



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*



STYLE 1 STYLE 2

XX = 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.

STYLE 1:
PIN 1. CATHODE (POLARITY BAND)
2. ANODE

STYLE 2:
NO POLARITY

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DESCRIPTION:	**SOD−323 1.70x1.25x0.85**		**PAGE 1 OF 1**

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