Zener Voltage Regulators
500 mW, Low I_Z SOD−523 Surface Mount

MM5Z4xxxTxG Series, SZMM5Z4xxxTxG Series

This series of Zener diodes is packaged in a SOD−523 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.

Features

- 500 mW Rating on FR−4 or FR−5 Board
- Wide Zener Reverse Voltage Range − 1.8 V to 43 V
- Low Reverse Current (I_{ZT}) − 50 μA
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- 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 Devices are Pb−Free and are RoHS Compliant*

Mechanical Characteristics:
CASE: Void-free, transfer-molded, thermosetting plastic case
FINISH: Corrosion resistant finish, easily solderable
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds
POLARITY: Cathode indicated by polarity band
FLAMMABILITY RATING: UL 94 V−0

MAXIMUM RATINGS

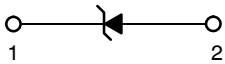
Rating	Symbol	Max	Units
Total Power Dissipation on FR−5 Board, (Note 1) @ T_L = 75°C Derated above 75°C	P_D	500 4.0	mW mW/°C
Thermal Resistance, (Note 2) Junction−to−Ambient	$R_{\theta JA}$	250	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

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−5 = 3.5 X 1.5 inches, using the minimum recommended footprint.
2. Thermal Resistance measurement obtained via infrared Scan Method.

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



SOD−523
CASE 502
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†
MM5Z4xxxT1G	SOD−523 (Pb−Free)	3,000 / Tape & Reel
SZMM5Z4xxxT1G	SOD−523 (Pb−Free)	3,000 / Tape & Reel
MM5Z4xxxT5G	SOD−523 (Pb−Free)	8,000 / Tape & Reel
SZMM5Z4xxxT5G	SOD−523 (Pb−Free)	8,000 / 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

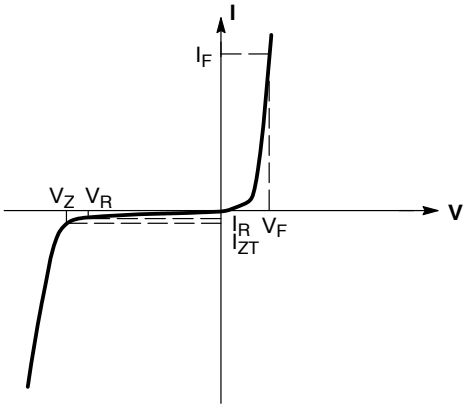
See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

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

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



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)

Device*	Device Marking	Zener Voltage (Note 3)				Leakage Current	
		V_Z (Volts)			@ I_{ZT}	I_R @ V_R	
		Min	Nom	Max	μA	μA	Volts
MM5Z4678T1G/T5G*	4A	1.71	1.8	1.89	50	7.5	1
MM5Z4679T1G/T5G*	42	1.90	2.0	2.10	50	5	1
MM5Z4680T1G/T5G	4C	2.09	2.2	2.31	50	4	1
MM5Z4681T1G/T5G*	4D	2.28	2.4	2.52	50	2	1
MM5Z4682T5G	4E	2.565	2.7	2.835	50	1	1
MM5Z4683T1G/T5G*	4F	2.85	3.0	3.15	50	0.8	1
MM5Z4684T1G/T5G*	4G	3.13	3.3	3.47	50	7.5	1.5
MM5Z4685T1G/T5G	4H	3.42	3.6	3.78	50	7.5	2
MM5Z4686T1G/T5G	43	3.70	3.9	4.10	50	5	2
MM5Z4687T1G/T5G	4J	4.09	4.3	4.52	50	4	2
MM5Z4688T1G/T5G	4K	4.47	4.7	4.94	50	10	3
MM5Z4689T1G/T5G	4L	4.85	5.1	5.36	50	10	3
MM5Z4690T1G/T5G	4M	5.32	5.6	5.88	50	10	4
MM5Z4691T1G/T5G*	4N	5.89	6.2	6.51	50	10	5
MM5Z4692T1G/T5G*	44	6.46	6.8	7.14	50	10	5.1
MM5Z4693T1G/T5G	4P	7.13	7.5	7.88	50	10	5.7
MM5Z4694T5G	4Q	7.79	8.2	8.61	50	1	6.2
MM5Z4695T1G/T5G*	4R	8.27	8.7	9.14	50	1	6.6
MM5Z4696T1G/T5G*	45	8.65	9.1	9.56	50	1	6.9
MM5Z4697T1G/T5G	4T	9.50	10	10.50	50	1	7.6
MM5Z4698T1G/T5G*	4U	10.45	11	11.55	50	0.05	8.4
MM5Z4699T5G	4V	11.40	12	12.60	50	0.05	9.1
MM5Z4700T1G/T5G*	4W	12.35	13	13.65	50	0.05	9.8
MM5Z4701T1G/T5G*	4X	13.30	14	14.70	50	0.05	10.6
MM5Z4702T5G	4Y	14.25	15	15.75	50	0.05	11.4
MM5Z4703T1G/T5G*	4Z	15.20	16	16.80	50	0.05	12.1
MM5Z4704T1G/T5G*	46	16.15	17	17.85	50	0.05	12.9
MM5Z4705T1G/T5G	47	17.10	18	18.90	50	0.05	13.6
MM5Z4706T1G/T5G*	5A	18.05	19	19.95	50	0.05	14.4
MM5Z4707T1G/T5G*	5C	19.00	20	21.00	50	0.01	15.2
MM5Z4708T1G/T5G*	5F	20.90	22	23.10	50	0.01	16.7
MM5Z4709T1G/T5G	5G	22.80	24	25.20	50	0.01	18.2
MM5Z4710T1G/T5G*	5H	23.75	25	26.25	50	0.01	19.0
MM5Z4711T1G/T5G	5K	25.65	27	28.35	50	0.01	20.4
MM5Z4712T1G/T5G*	5L	26.60	28	29.40	50	0.01	21.2
MM5Z4713T1G/T5G*	5N	28.50	30	31.50	50	0.01	22.8
MM5Z4714T1G/T5G	5P	31.35	33	34.65	50	0.01	25.0
MM5Z4715T1G/T5G	5Q	34.20	36	37.80	50	0.01	27.3
MM5Z4716T1G/T5G*	5R	37.05	39	40.95	50	0.01	29.6
MM5Z4717T1G/T5G	5T	40.85	43	45.15	50	0.01	32.6

3. Nominal Zener voltage is measured with the device junction in thermal equilibrium at T_L = 30°C ±1°C.
*Please Contact Sales.

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TYPICAL CHARACTERISTICS

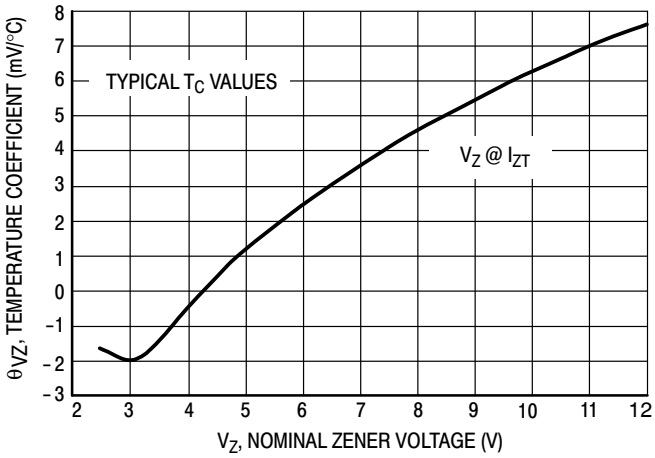


Figure 1. Temperature Coefficients (Temperature Range −55°C to +150°C)

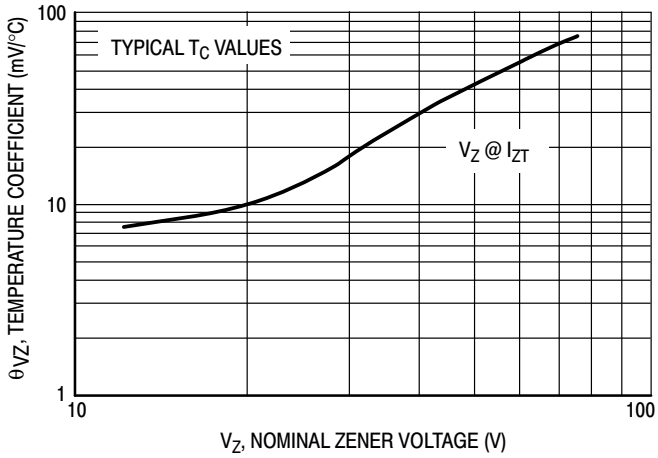


Figure 2. Temperature Coefficients (Temperature Range −55°C to +150°C)

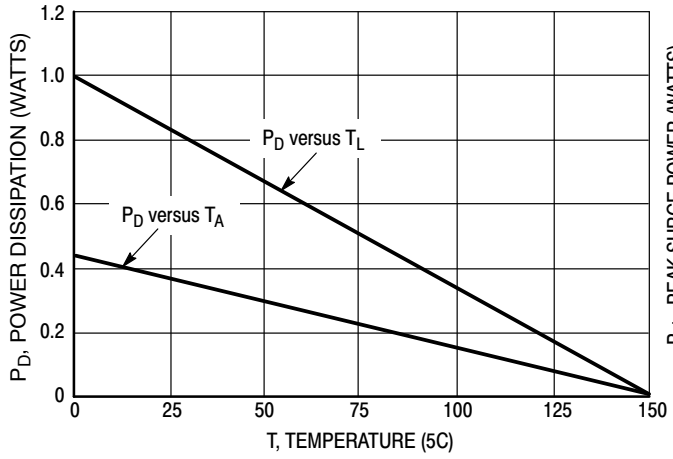


Figure 3. Steady State Power Derating

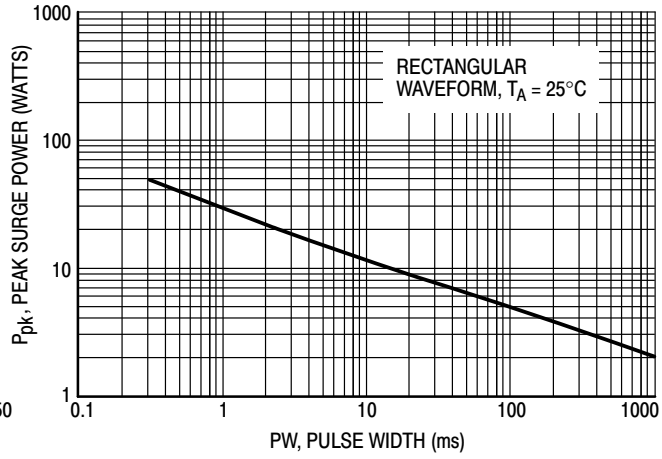


Figure 4. Maximum Nonrepetitive Surge Power

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TYPICAL CHARACTERISTICS

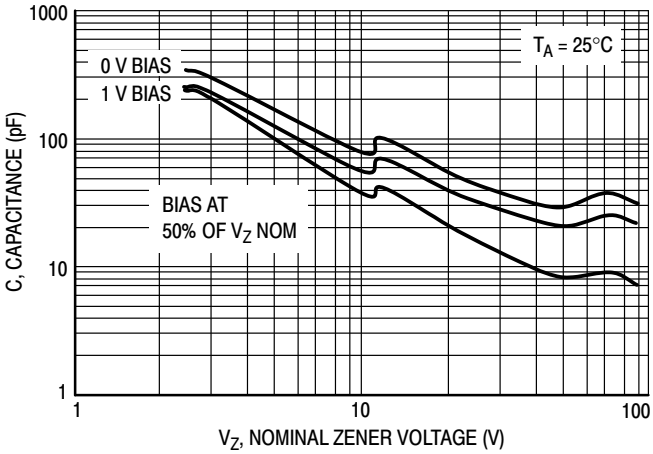


Figure 5. Typical Capacitance

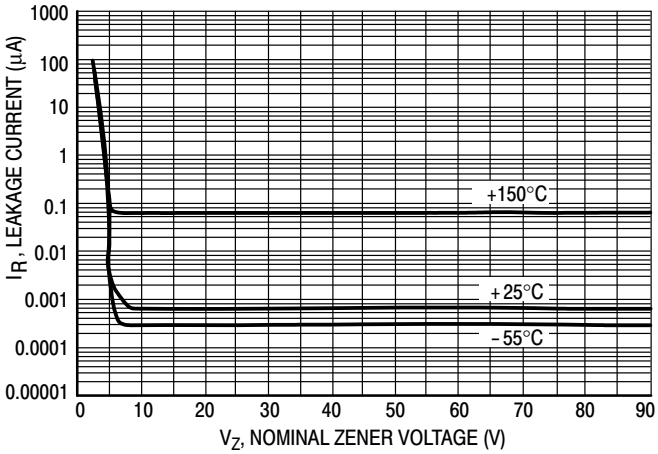


Figure 6. Typical Leakage Current

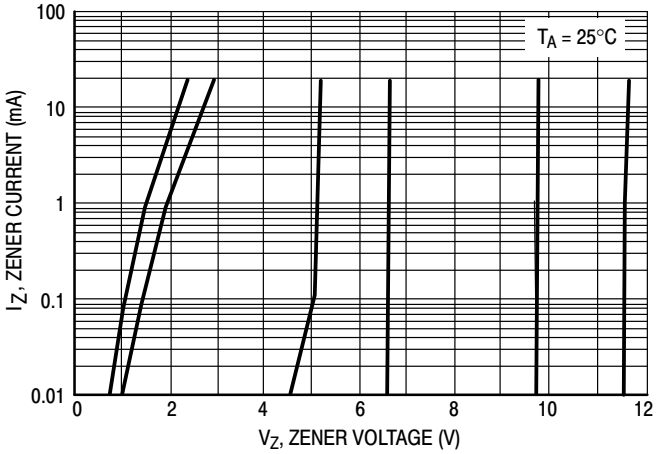


Figure 7. Zener Voltage versus Zener Current (V_Z Up to 12 V)

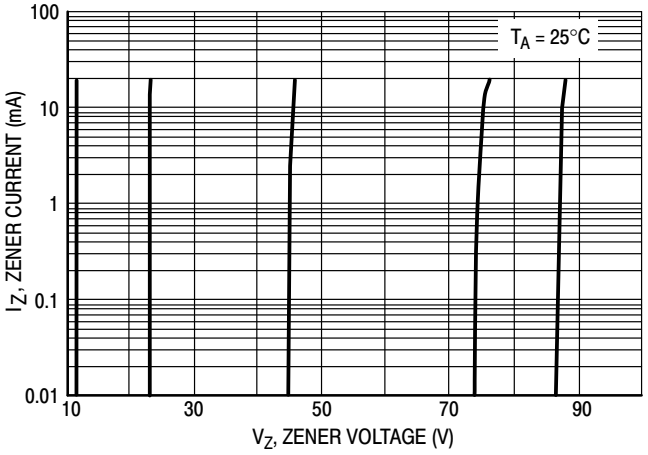
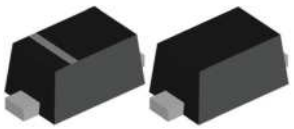


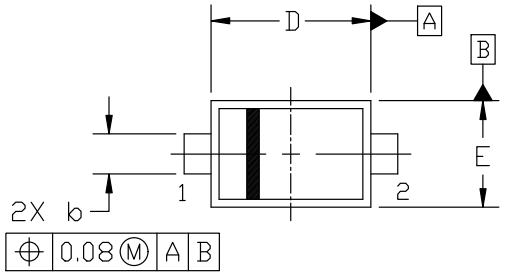
Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)

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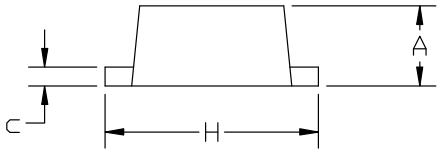


SOD−523 1.20x0.80x0.60
CASE 502
ISSUE F

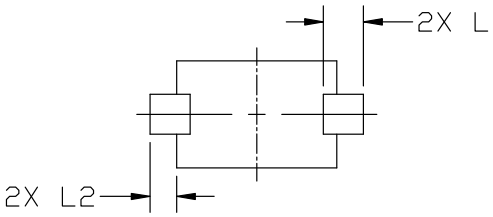
DATE 08 FEB 2024



TOP VIEW



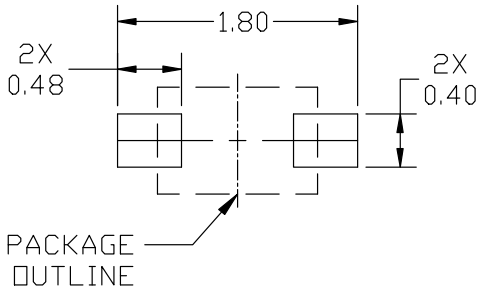
SIDE VIEW



BOTTOM VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
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.

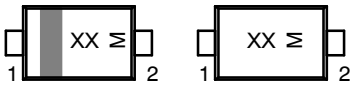
	MILLIMETERS		
DIM	MIN.	NOM.	MAX.
A	0.50	0.60	0.70
b	0.25	0.30	0.35
c	0.07	0.14	0.20
D	1.10	1.20	1.30
E	0.70	0.80	0.90
H	1.50	1.60	1.70
L	0.30 REF		
L2	0.15	0.20	0.25



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−523 1.20x0.80x0.60**		**PAGE 1 OF 1**

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