



**THE DATASHEET OF
MM5Z4V7ST1G**



MM5ZxxxST1G Series, SZMM5ZxxxST1G Series

Zener Voltage Regulators

500 mW SOD-523 Surface Mount

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.

Specification Features

- Standard Zener Breakdown Voltage Range -2.4 V to 18 V
- Steady State Power Rating of 500 mW
- Small Body Outline Dimensions:
0.047" x 0.032" (1.20 mm x 0.80 mm)
- Low Body Height: 0.028" (0.7 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 Devices are Pb-Free and are RoHS Compliant*

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-4 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	500 4.0	mW mW/°C
Thermal Resistance from Junction-to-Ambient (Note 1)	$R_{\theta JA}$	250	°C/W
Operating 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 cm².

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

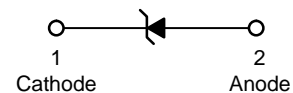


ON Semiconductor®

www.onsemi.com



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†
MM5ZxxxST1G	SOD-523 (Pb-Free)	3,000 / Tape & Reel
SZMM5ZxxxST1G	SOD-523 (Pb-Free)	3,000 / Tape & Reel
MM5ZxxxST5G	SOD-523 (Pb-Free)	8,000 / Tape & Reel
SZMM5ZxxxST5G	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 2 of this data sheet.

MM5ZxxxST1G Series, SZMM5ZxxxST1G Series

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

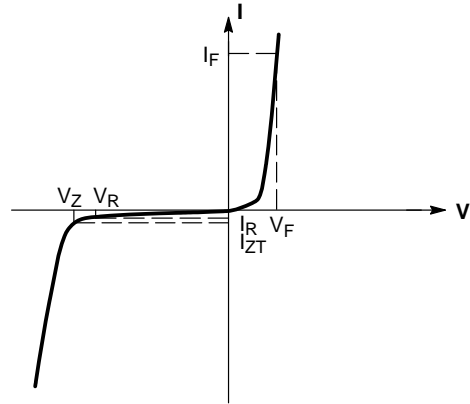


Figure 1. Zener Voltage Regulator

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

Device*	Device Marking	Test Current I_{zt} mA	Zener Voltage V_Z		Z_{ZK} $I_Z = 1.0\text{ mA } \Omega$ Max	Z_{ZT} $I_Z = I_{ZT}$ @ 10% Mod Ω Max	Max IR @ V_R		dV_Z/dT (mV/k) @ $I_{ZT1} = 5\text{ mA}$		C pF Max @ $V_R = 0$ $f = 1\text{ MHz}$
			Min	Max			μA	V	Min	Max	
MM5Z2V4ST1G/T5G	T2	5.0	2.43	2.63	1000	100	120	1.0	-3.5	0	450
MM5Z2V7ST1G	T3	5.0	2.67	2.91	1000	100	100	1.0	-3.5	0	450
MM5Z3V3ST1G	T5	5.0	3.32	3.53	1000	95	5.0	1.0	-3.5	0	450
MM5Z3V6ST1G	T6	5.0	3.60	3.85	1000	90	5.0	1.0	-3.5	0	450
MM5Z3V9ST1G	T7	5.0	3.89	4.16	1000	90	3.0	1.0	-3.5	-2.5	450
MM5Z4V3ST1G	T8	5.0	4.17	4.43	1000	90	3.0	1.0	-3.5	0	450
MM5Z4V7ST1G/T5G	T9	5.0	4.55	4.75	800	80	3.0	2.0	-3.5	0.2	260
MM5Z5V1ST1G/T5G	TA	5.0	4.98	5.2	500	60	2.0	2.0	-2.7	1.2	225
MM5Z5V6ST1G/T5G	TC	5.0	5.49	5.73	200	40	1.0	2.0	-2.0	2.5	200
MM5Z6V2ST1G/T5G	TE	5.0	6.06	6.33	100	10	3.0	4.0	0.4	3.7	185
MM5Z6V8ST1G/T5G	TF	5.0	6.65	6.93	160	15	2.0	4.0	1.2	4.5	155
MM5Z7V5ST1G	TG	5.0	7.28	7.6	160	15	1.0	5.0	2.5	5.3	140
MM5Z8V2ST1G/T5G	TH	5.0	8.02	8.36	160	15	0.7	5.0	3.2	6.2	135
MM5Z9V1ST1G/T5G	TK	5.0	8.85	9.23	160	15	0.5	6.0	3.8	7.0	130
MM5Z12VST1G	TN	5.0	11.74	12.24	80	25	0.1	8.0	6.0	10	130
MM5Z16VST1G	TU	5.0	15.85	16.51	80	40	0.05	11.2	10.4	14	105
MM5Z18VST1G	TW	5.0	17.56	18.35	80	45	0.05	12.6	12.4	16	100

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.

*Includes SZ-prefix devices where applicable.

TYPICAL CHARACTERISTICS

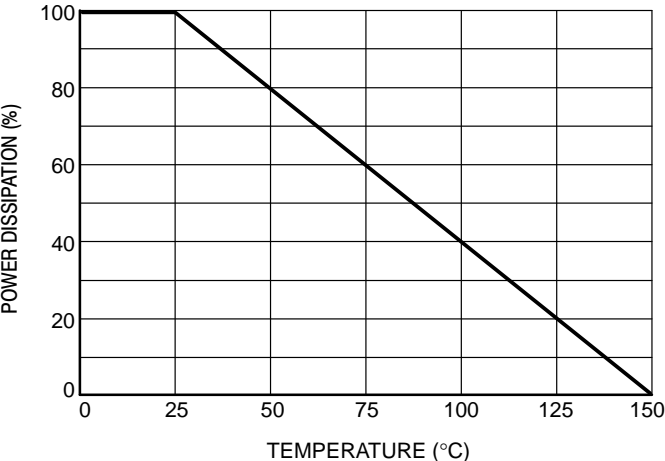
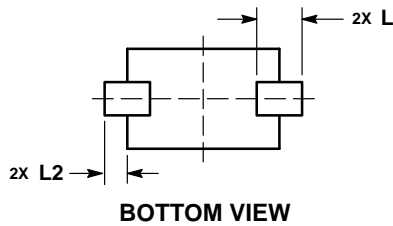
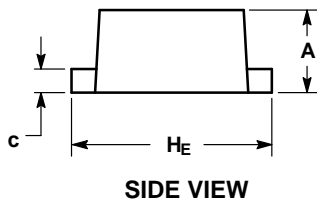
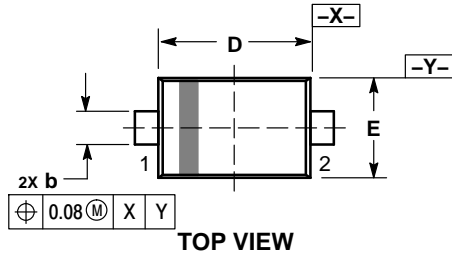


Figure 2. Steady State Power Derating

MM5ZxxxST1G Series, SZMM5ZxxxST1G Series

PACKAGE DIMENSIONS

SOD-523
CASE 502
ISSUE E



NOTES:

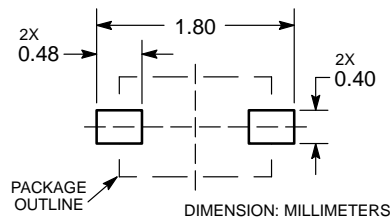
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS		
	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 _E	1.50	1.60	1.70
L	0.30 REF		
L2	0.15	0.20	0.25

STYLE 1:

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

**RECOMMENDED
SOLDERING 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.

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 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

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View MM5Z4V7ST1G on WIN SOURCE](#)
- ⊖ [ON Semiconductor Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management