## **Zener Voltage Regulators**

500 mW SOD-523, Standard Tolerance Series

# MM5ZxxxT1G Series, SZMM5ZxxxT1G 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.

## **Specification Features:**

- Standard Zener Breakdown Voltage Range 2.4 V to 75 V
- Standard Tolerance Series
- 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
- 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 <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	500 4.0	mW mW/°C
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	250	°C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-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<sup>2</sup>.

\*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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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 <sup>†</sup>
MM5ZxxxT1G	SOD-523 (Pb-Free)	3,000 / Tape & Reel
SZMM5ZxxxT1G	SOD-523 (Pb-Free)	3,000 / Tape & Reel
MM5ZxxxT5G	SOD-523 (Pb-Free)	8,000 / Tape & Reel
SZMM5ZxxxT5G	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 tables starting on page 3 of this data sheet

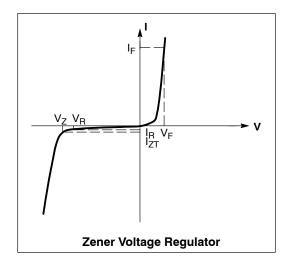
## MM5ZxxxT1G Series, SZMM5ZxxxT1G Series

## **ELECTRICAL CHARACTERISTICS**

 $(T_A = 25^{\circ}C \text{ unless otherwise noted,})$ 

 $V_F = 0.9 \text{ V Max.} @ I_F = 10 \text{ mA for all types})$ 

Symbol	Parameter
VZ	Reverse Zener Voltage @ I <sub>ZT</sub>
I <sub>ZT</sub>	Reverse Current
Z <sub>ZT</sub>	Maximum Zener Impedance @ I <sub>ZT</sub>
I <sub>ZK</sub>	Reverse Current
Z <sub>ZK</sub>	Maximum Zener Impedance @ I <sub>ZK</sub>
I <sub>R</sub>	Reverse Leakage Current @ V <sub>R</sub>
V <sub>R</sub>	Reverse Voltage
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>
ΘV <sub>Z</sub>	Maximum Temperature Coefficient of V <sub>Z</sub>
С	Max. Capacitance @V <sub>R</sub> = 0 and f = 1 MHz



## **TYPICAL CHARACTERISTICS**

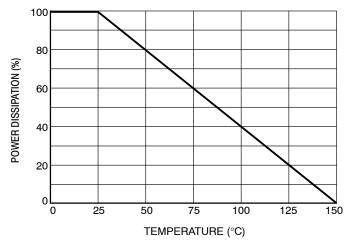


Figure 1. Steady State Power Derating

## MM5ZxxxT1G Series, SZMM5ZxxxT1G Series

## **ELECTRICAL CHARACTERISTICS - Standard Tolerance Series**

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

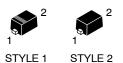
Part			,	/	a	V <sub>72</sub> (V) @		Zener Impedance		Leakage Current				С	
MMSZ2YT1G/TSG		Device	,	(Note 1)		(No	te 1)	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @	۵ I <sub>ZK</sub>	I <sub>R</sub> @	9 V <sub>R</sub>			@ V <sub>R</sub> = 0
MMSZ2V7TIG/TSG 02 2.8 3.0 3.2 2.1 1.2 7 100 1000 1.0 1.0 1.0 1.0 -3.5 0 450 1450 14552 1451 1451 1451 1451 1451 1451 145	Device*		Min	Nom	Max	Min	Max	Ω	Ω	mA	μА	Volts	Min	Max	pF
MMSZ3VST1G/TSG   O.2   2.8   3.0   3.2   2.1   2.7   1.00   1.00   1.0   1.0   1.0   -3.5   0   450   MMSZ3VST1G/TSG   O.6   3.4   3.8   3.8   2.7   3.3   90   1000   1.0   5   1.0   -3.5   0   450   450   MMSZ3VST1G/TSG   A.3   3.7   3.9   4.2   2.9   3.5   90   1000   1.0   3   1.0   -3.5   0   450   450   MMSZ4VST1G/TSG   O.8   4.0   4.3   4.6   3.3   4   90   1000   1.0   3   1.0   -3.5   0   450   450   MMSZ4VT1G/TSG   O.8   4.4   4.7   5.0   3.7   4.7   80   800   1.0   3   1.0   -3.5   0.2   260   MMSZ4VT1G/TSG   O.8   4.4   4.7   5.0   3.7   4.7   80   800   1.0   3   1.0   -3.5   0.2   260   MMSZ5VT1G/TSG   O.6   5.8   5.6   6.0   6.0   6.0   6.0   1.0   1.0   3   1.0   -3.5   0.2   260   MMSZ5VT1G/TSG   O.5   5.8   6.0   6.0   6.0   6.0   1.0   1.0   1.0   1.0   1.0   2.0   -2.7   1.2   225   0.0   MMSZ5VST1G/TSG   O.5   5.8   6.0   6.0   6.0   6.0   1.0   1.0   1.0   1.0   1.0   0.0	MM5Z2V4T1G/T5G	00	2.2	2.4	2.6	1.7	2.1	100	1000	1.0	50	1.0	-3.5	0	450
MMSZ3V3T1G/TSG   0.5   3.1   3.3   3.5   2.3   2.9   9.5   1000   1.0   5.0   1.0   -3.5   0.0   450   MMSZ3V9T1G/TSG   0.6   3.4   3.6   3.8   2.7   3.3   9.0   1000   1.0   5.0   1.0   -3.5   0.0   450   MMSZ3V9T1G/TSG   0.8   4.0   4.3   4.6   3.8   4.0   3.5   4.0   9.0   1000   1.0   3.0   1.0   -3.5   0.0   450   MMSZ4V3T1G/TSG   0.8   4.0   4.3   4.6   3.3   4.7   8.0   8.0   1.0   3.0   1.0   -3.5   0.0   450   MMSZ4V3T1G/TSG   0.0   4.4   4.7   5.0   3.7   4.7   8.0   8.0   1.0   3.0   1.0   -3.5   0.2   260   MMSZ4V3T1G/TSG   0.0   4.8   5.1   5.4   4.2   5.3   6.0   5.0   5.0   1.0   2.0   2.0   -2.7   1.2   2.25   MMSZ5V6T1G/TSG   0.0   5.2   5.6   6.0   4.8   6.   4.0   2.0   1.0   1.0   2.0   2.0   2.5   2.00   MMSZ6V8T1G/TSG   0.0   5.8   6.2   6.8   6.8   6.8   6.0   4.0   2.0   1.0   1.0   2.0   2.0   2.5   2.00   MMSZ6V8T1G/TSG   0.0   5.4   6.8   7.2   6.3   7.2   1.5   1.0   1.0   1.0   1.0   2.0   2.5   2.00   MMSZ6V8T1G/TSG   0.0   6.4   6.8   7.2   6.3   7.2   1.5   1.0   1.0   1.0   1.0   2.0   2.5   3.3   1.0   4	MM5Z2V7T1G/T5G	01	2.5	2.7	2.9	1.9	2.4	100	1000	1.0	20	1.0	-3.5	0	450
MMSZ3VST1G/TSG	MM5Z3V0T1G/T5G	02	2.8	3.0	3.2	2.1	2.7	100	1000	1.0	10	1.0	-3.5	0	450
MMSZ3V9T1G/TSG         AJ         3.7         3.9         4.2         2.9         3.5         90         100         1.0         3.0         4.0         4.3         4.6         3.3         4         90         100         1.0         3.0         1.0         3.5         0         450           MMSZ4VYT1G/TSG         0.9         4.4         4.7         5.0         3.7         4.7         80         800         1.0         3.0         -0.5         5.0         2.2         2.0         -2.0         2.5         2.0         2.0         2.0         2.0         2.0         2.2         2.0         2.2         2.0         2.0         2.2         2.0         2.2         2.0         2.0         2.2         2.0         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.2         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0         2.0	MM5Z3V3T1G/T5G	05	3.1	3.3	3.5	2.3	2.9	95	1000	1.0	5	1.0	-3.5	0	450
MMSZ4V3T1G/T5G	MM5Z3V6T1G/T5G	06	3.4	3.6	3.8	2.7	3.3	90	1000	1.0	5	1.0	-3.5	0	450
MMSZ4VTTIG/TSG	MM5Z3V9T1G/T5G	AJ	3.7	3.9	4.2	2.9	3.5	90	1000	1.0	3	1.0	-3.5	0	450
MMSZSVITIG/T5G         OA         4.8         5.1         5.4         4.2         5.3         60         500         1.0         2         2.0         -2.7         1.2         225           MMSZSVGTIG/T5G         OC         5.2         5.6         6.0         4.8         6         40         200         1.0         1.0         2.0         -2.0         2.5         200           MMSZSVTIG/T5G         OE         5.8         6.2         6.6         5.6         6.6         10         100         1.0         3         4.0         0.4         3.7         185           MMSZVSVTIG/T5G         OF         6.4         6.8         7.2         7.9         6.9         7.9         15         160         1.0         1         7.0         2.5         5.3         140           MMSZVSVTIG/T5G         OR         7.7         7.6         8.7         15         160         1.0         1.2         2.5         5.3         140           MMSZVSVTIG/T5G         OR         1.1         11.6         10.2         11.6         10.0         1.0         1.0         8.0         4.5         8.0         130           MMSZ1VTTG/T5G         OR	MM5Z4V3T1G/T5G	08	4.0	4.3	4.6	3.3	4	90	1000	1.0	3	1.0	-3.5	0	450
MMSZSV6T1G/T5G         OC         5.2         5.6         6.0         4.8         6         40         200         1.0         1         2.0         -2.0         2.5         200           MMSZ6V2T1G/T5G         OE         5.8         6.2         6.6         5.6         6.6         10         100         1.0         3.4         0.0         4.4         3.7         185           MMSZ6V8T1G/T5G         OF         6.4         6.8         7.2         6.9         7.9         15         160         1.0         1.0         1.0         1.2         4.0         1.2         4.5         155           MMSZ8V2T1G/T5G         OH         7.7         8.2         8.7         7.6         8.7         15         160         1.0         1.0         1.0         2.5         5.3         140           MMSZ1VT1G/T5G         OK         8.5         9.1         9.6         8.4         9.8         15         160         1.0         0.1         4.5         8.0         130           MMSZ1VT1G/T5G         OM         10.4         11         11.6         10.2         11.6         20         160         1.0         0.1         8.0         5.0         130 <td>MM5Z4V7T1G/T5G</td> <td>09</td> <td>4.4</td> <td>4.7</td> <td>5.0</td> <td>3.7</td> <td>4.7</td> <td>80</td> <td>800</td> <td>1.0</td> <td>3</td> <td>2.0</td> <td>-3.5</td> <td>0.2</td> <td>260</td>	MM5Z4V7T1G/T5G	09	4.4	4.7	5.0	3.7	4.7	80	800	1.0	3	2.0	-3.5	0.2	260
MMSZ6VZT1G/T5G	MM5Z5V1T1G/T5G	0A	4.8	5.1	5.4	4.2	5.3	60	500	1.0	2	2.0	-2.7	1.2	225
MMSZ6V8T1G/TSG         OF         6.4         6.8         7.2         6.3         7.2         15         160         1.0         2         4.0         1.2         4.5         155           MMSZ7V5T1G/TSG         OG         7.0         7.5         7.9         6.9         7.9         15         160         1.0         1.0         2.5         5.3         140           MMSZ8V2T1G/TSG         OH         7.7         8.2         8.7         7.6         8.7         15         160         1.0         0.7         5.0         3.2         6.2         135           MMSZ1VT1G/TSG         OK         8.5         9.1         9.6         8.4         9.6         15         160         1.0         0.1         8.0         4.5         8.0         130           MMSZ1VT1G/TSG         OM         10.4         11         11.6         10.2         11.6         20         160         1.0         0.1         8.0         4.5         8.0         130           MMSZ1VT1G/TSG         ON         11.4         12.2         12.7         11.2         12.7         25         80         1.0         0.1         8.0         10         130           MMSZ1V	MM5Z5V6T1G/T5G	0C	5.2	5.6	6.0	4.8	6	40	200	1.0	1	2.0	-2.0	2.5	200
MM5Z7V5T1G/T5G         OG         7.0         7.5         7.9         6.9         7.9         15         160         1.0         1         5.0         2.5         5.3         140           MM5Z8V2T1G/T5G         OH         7.7         8.2         8.7         7.6         8.7         15         160         1.0         0.7         5.0         3.2         6.2         135           MM5Z9V1T1G/T5G         OK         8.5         9.1         9.6         8.4         9.6         15         160         1.0         0.2         7.0         3.8         7.0         130           MM5Z1VT1G/T5G         OL         9.4         10         10.6         9.3         10.6         20         160         1.0         0.1         8.0         4.5         8.0         130           MM5Z13VT1G/T5G         OM         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MM5Z18VT1G/T5G         OP         12.4         13.25         14.1         12.3         14.2         27.         40         80         1.0         0.1         9.2         13         11	MM5Z6V2T1G/T5G	0E	5.8	6.2	6.6	5.6	6.6	10	100	1.0	3	4.0	0.4	3.7	185
MM5Z8V2T1G/T5G         OH         7.7         8.2         8.7         7.6         8.7         15         160         1.0         0.7         5.0         3.2         6.2         138           MM5Z9V1T1G/T5G         OK         8.5         9.1         9.6         8.4         9.6         15         160         1.0         0.2         7.0         3.8         7.0         130           MM5Z10VT1G/T5G         OL         9.4         10         10.6         9.3         10.6         20         160         1.0         0.1         8.0         4.5         8.0         130           MM5Z12VT1G/T5G         OM         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MM5Z13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.0         6.0         10         11         12           MM5Z19VT1G/T5G         OT         14.3         15         15.8         13.7         15.5         30         80         1.0         0.05         12.1         14         10	MM5Z6V8T1G/T5G	0F	6.4	6.8	7.2	6.3	7.2	15	160	1.0	2	4.0	1.2	4.5	155
MMSZ9V1T1G/T5G         OK         8.5         9.1         9.6         8.4         9.6         15         160         1.0         0.2         7.0         3.8         7.0         130           MMSZ10VT1G/T5G         OL         9.4         10         10.6         9.3         10.6         20         160         1.0         0.1         8.0         4.5         8.0         130           MMSZ11VT1G/T5G         OM         10.4         11         11.6         10.2         11.6         20         160         1.0         0.1         8.0         5.4         9.0         130           MMSZ13VT1G/T5G         ON         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MMSZ13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.0         10.5         9.2         13         110           MMSZ18VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         12.6         12.4         16	MM5Z7V5T1G/T5G	0G	7.0	7.5	7.9	6.9	7.9	15	160	1.0	1	5.0	2.5	5.3	140
MM5Z10VT1G/T5G         OL         9.4         10         10.6         9.3         10.6         20         160         1.0         0.1         8.0         4.5         8.0         130           MM5Z11VT1G/T5G         OM         10.4         11         11.6         10.2         11.6         20         160         1.0         0.1         8.0         5.4         9.0         130           MM5Z12VT1G/T5G         ON         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MM5Z13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.0         10.5         9.2         13         110           MM5Z16VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         12.6         12.4         16         100           MM5Z18VT1G/T5G         OW         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.6         12.4         16	MM5Z8V2T1G/T5G	0H	7.7	8.2	8.7	7.6	8.7	15	160	1.0	0.7	5.0	3.2	6.2	135
MM5Z11VT1G/T5G         OM         10.4         11         11.6         10.2         11.6         20         160         1.0         0.1         8.0         5.4         9.0         130           MM5Z12VT1G/T5G         ON         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MM5Z13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.1         8.0         7.0         11         120           MM5Z16VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         11.2         10.4         10           MM5Z18VT1G/T5G         OW         16.8         18         19.1         16.7         19         45         80         1.0         0.05         11.2         10.4         10           MM5Z18VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         14.4         18         85           MM5Z23VT1G/T5	MM5Z9V1T1G/T5G	0K	8.5	9.1	9.6	8.4	9.6	15	160	1.0	0.2	7.0	3.8	7.0	130
MMSZ12VT1G/T5G         ON         11.4         12         12.7         11.2         12.7         25         80         1.0         0.1         8.0         6.0         10         130           MMSZ13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.1         8.0         7.0         11         120           MMSZ16VT1G/T5G         OT         14.3         15         15.8         13.7         15.5         30         80         1.0         0.05         10.5         9.2         13         110           MMSZ18VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         11.2         10.4         14         105           MM5Z18VT1G/T5G         OW         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.4         16         100           MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80	MM5Z10VT1G/T5G	0L	9.4	10	10.6	9.3	10.6	20	160	1.0	0.1	8.0	4.5	8.0	130
MM5Z13VT1G/T5G         OP         12.4         13.25         14.1         12.3         14         30         80         1.0         0.1         8.0         7.0         11         120           MM5Z15VT1G/T5G         OT         14.3         15         15.8         13.7         15.5         30         80         1.0         0.05         10.5         9.2         13         110           MM5Z16VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         11.2         10.4         14         105           MM5Z18VT1G/T5G         OW         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.6         12.4         16         100           MM5Z18VT1G/T5G         OZ         18.8         20         21.2         18.7         21.1         55         100         1.0         0.05         14.0         14.4         18         85           MM5Z12VT1G/T5G         10         20.8         22         23.3         20.7         23.2         25         70         120         1.0         0.05         16.8         18.4 <td>MM5Z11VT1G/T5G</td> <td>OM</td> <td>10.4</td> <td>11</td> <td>11.6</td> <td>10.2</td> <td>11.6</td> <td>20</td> <td>160</td> <td>1.0</td> <td>0.1</td> <td>8.0</td> <td>5.4</td> <td>9.0</td> <td>130</td>	MM5Z11VT1G/T5G	OM	10.4	11	11.6	10.2	11.6	20	160	1.0	0.1	8.0	5.4	9.0	130
MM5Z15VT1G/T5G         0T         14.3         15         15.8         13.7         15.5         30         80         1.0         0.05         10.5         9.2         13         110           MM5Z16VT1G/T5G         0U         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         11.2         10.4         14         105           MM5Z18VT1G/T5G         0W         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.6         12.4         16         100           MM5Z22VT1G/T5G         0Z         18.8         20         21.2         18.7         21.1         55         100         1.0         0.05         14.0         14.4         18         85           MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         16.8         18.4         22         80           MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         18.9         21.4         2	MM5Z12VT1G/T5G	0N	11.4	12	12.7	11.2	12.7	25	80	1.0	0.1	8.0	6.0	10	130
MM5Z16VT1G/T5G         OU         15.3         16.2         17.1         15.2         17         40         80         1.0         0.05         11.2         10.4         14         105           MM5Z18VT1G/T5G         OW         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.6         12.4         16         100           MM5Z20VT1G/T5G         OZ         18.8         20         21.2         18.7         21.1         55         100         1.0         0.05         14.0         14.4         18         85           MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         15.4         16.4         20         85           MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80           MM5Z30VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         21.0         24.4         29	MM5Z13VT1G/T5G	0P	12.4	13.25	14.1	12.3	14	30	80	1.0	0.1	8.0	7.0	11	120
MM5Z18VT1G/T5G         0W         16.8         18         19.1         16.7         19         45         80         1.0         0.05         12.6         12.4         16         100           MM5Z20VT1G/T5G         0Z         18.8         20         21.2         18.7         21.1         55         100         1.0         0.05         14.0         14.4         18         85           MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         16.8         18.4         20         85           MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80           MM5Z30VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         18.9         21.4         25.3         70           MM5Z33VT1G/T5G         18         31         33         35         30.8         35         80         300         1.0         0.05         23.2         27.4         33.4 </td <td>MM5Z15VT1G/T5G</td> <td>0T</td> <td>14.3</td> <td>15</td> <td>15.8</td> <td>13.7</td> <td>15.5</td> <td>30</td> <td>80</td> <td>1.0</td> <td>0.05</td> <td>10.5</td> <td>9.2</td> <td>13</td> <td>110</td>	MM5Z15VT1G/T5G	0T	14.3	15	15.8	13.7	15.5	30	80	1.0	0.05	10.5	9.2	13	110
MM5Z20VT1G/T5G         OZ         18.8         20         21.2         18.7         21.1         55         100         1.0         0.05         14.0         14.4         18         85           MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         15.4         16.4         20         85           MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80           MM5Z27VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         18.9         21.4         25.3         70           MM5Z30VT1G/T5G         14         28         30         32         27.8         32         80         300         1.0         0.05         21.0         24.4         29.4         70           MM5Z36VT1G/T5G         19         34         36         38         33.8         38         90         500         1.0         0.05         25.2         30.4         37.4 <td>MM5Z16VT1G/T5G</td> <td>0U</td> <td>15.3</td> <td>16.2</td> <td>17.1</td> <td>15.2</td> <td>17</td> <td>40</td> <td>80</td> <td>1.0</td> <td>0.05</td> <td>11.2</td> <td>10.4</td> <td>14</td> <td>105</td>	MM5Z16VT1G/T5G	0U	15.3	16.2	17.1	15.2	17	40	80	1.0	0.05	11.2	10.4	14	105
MM5Z22VT1G/T5G         10         20.8         22         23.3         20.7         23.2         55         100         1.0         0.05         15.4         16.4         20         85           MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80           MM5Z27VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         18.9         21.4         25.3         70           MM5Z30VT1G/T5G         14         28         30         32         27.8         32         80         300         1.0         0.05         21.0         24.4         29.4         70           MM5Z33VT1G/T5G         18         31         33         35         30.8         35         80         300         1.0         0.05         23.2         27.4         33.4         70           MM5Z39VT1G/T5G         19         34         36         38         33.8         38         90         500         1.0         0.05         27.3         33.4         41.2	MM5Z18VT1G/T5G	OW	16.8	18	19.1	16.7	19	45	80	1.0	0.05	12.6	12.4	16	100
MM5Z24VT1G/T5G         11         22.8         24.2         25.6         22.7         25.5         70         120         1.0         0.05         16.8         18.4         22         80           MM5Z27VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         18.9         21.4         25.3         70           MM5Z30VT1G/T5G         14         28         30         32         27.8         32         80         300         1.0         0.05         21.0         24.4         29.4         70           MM5Z33VT1G/T5G         18         31         33         35         30.8         35         80         300         1.0         0.05         23.2         27.4         33.4         70           MM5Z36VT1G/T5G         19         34         36         38         33.8         38         90         500         1.0         0.05         25.2         30.4         37.4         70           MM5Z39VT1G/T5G         20         37         39         41         36.7         41         130         500         1.0         0.05         30.1         37.6         46.6	MM5Z20VT1G/T5G	0Z	18.8	20	21.2	18.7	21.1	55	100	1.0	0.05	14.0	14.4	18	85
MM5Z27VT1G/T5G         12         25.1         27         28.9         25         28.9         80         300         1.0         0.05         18.9         21.4         25.3         70           MM5Z30VT1G/T5G         14         28         30         32         27.8         32         80         300         1.0         0.05         21.0         24.4         29.4         70           MM5Z33VT1G/T5G         18         31         33         35         30.8         35         80         300         1.0         0.05         23.2         27.4         33.4         70           MM5Z36VT1G/T5G         19         34         36         38         33.8         38         90         500         1.0         0.05         23.2         27.4         33.4         70           MM5Z39VT1G/T5G         20         37         39         41         36.7         41         130         500         1.0         0.05         27.3         33.4         41.2         45           MM5Z43VT1G/T5G         21         40         43         46         39.7         46         150         500         1.0         0.05         30.1         37.6         46.6 <t< td=""><td>MM5Z22VT1G/T5G</td><td>10</td><td>20.8</td><td>22</td><td>23.3</td><td>20.7</td><td>23.2</td><td>55</td><td>100</td><td>1.0</td><td>0.05</td><td>15.4</td><td>16.4</td><td>20</td><td>85</td></t<>	MM5Z22VT1G/T5G	10	20.8	22	23.3	20.7	23.2	55	100	1.0	0.05	15.4	16.4	20	85
MM5Z30VT1G/T5G       14       28       30       32       27.8       32       80       300       1.0       0.05       21.0       24.4       29.4       70         MM5Z33VT1G/T5G       18       31       33       35       30.8       35       80       300       1.0       0.05       23.2       27.4       33.4       70         MM5Z36VT1G/T5G       19       34       36       38       33.8       38       90       500       1.0       0.05       25.2       30.4       37.4       70         MM5Z39VT1G/T5G       20       37       39       41       36.7       41       130       500       1.0       0.05       27.3       33.4       41.2       45         MM5Z43VT1G/T5G       21       40       43       46       39.7       46       150       500       1.0       0.05       30.1       37.6       46.6       40         MM5Z47VT1G/T5G       1A       44       47       50       43.7       50       170       500       1.0       0.05       32.9       42.0       51.8       40         MM5Z56VT1G***       1D       52       56       60       51.5       60	MM5Z24VT1G/T5G	11	22.8	24.2	25.6	22.7	25.5	70	120	1.0	0.05	16.8	18.4	22	80
MM5Z33VT1G/T5G       18       31       33       35       30.8       35       80       300       1.0       0.05       23.2       27.4       33.4       70         MM5Z36VT1G/T5G       19       34       36       38       33.8       38       90       500       1.0       0.05       25.2       30.4       37.4       70         MM5Z39VT1G/T5G       20       37       39       41       36.7       41       130       500       1.0       0.05       27.3       33.4       41.2       45         MM5Z43VT1G/T5G       21       40       43       46       39.7       46       150       500       1.0       0.05       30.1       37.6       46.6       40         MM5Z43VT1G/T5G       1A       44       47       50       43.7       50       170       500       1.0       0.05       32.9       42.0       51.8       40         MM5Z51VT1G***       1C       48       51       54       47.6       54       180       500       1.0       0.05       35.7       46.6       57.2       40         MM5Z62VT1G***       1D       52       56       60       51.5       60	MM5Z27VT1G/T5G	12	25.1	27	28.9	25	28.9	80	300	1.0	0.05	18.9	21.4	25.3	70
MM5Z36VT1G/T5G       19       34       36       38       33.8       38       90       500       1.0       0.05       25.2       30.4       37.4       70         MM5Z39VT1G/T5G       20       37       39       41       36.7       41       130       500       1.0       0.05       27.3       33.4       41.2       45         MM5Z43VT1G/T5G       21       40       43       46       39.7       46       150       500       1.0       0.05       30.1       37.6       46.6       40         MM5Z47VT1G/T5G       1A       44       47       50       43.7       50       170       500       1.0       0.05       32.9       42.0       51.8       40         MM5Z51VT1G***       1C       48       51       54       47.6       54       180       500       1.0       0.05       35.7       46.6       57.2       40         MM5Z68VT1G***       1D       52       56       60       51.5       60       200       500       1.0       0.05       39.2       52.2       63.8       40         MM5Z68VT1G***       1E       58       62       66       57.4       66	MM5Z30VT1G/T5G	14	28	30	32	27.8	32	80	300	1.0	0.05	21.0	24.4	29.4	70
MM5Z39VT1G/T5G         20         37         39         41         36.7         41         130         500         1.0         0.05         27.3         33.4         41.2         45           MM5Z43VT1G/T5G         21         40         43         46         39.7         46         150         500         1.0         0.05         30.1         37.6         46.6         40           MM5Z47VT1G/T5G         1A         44         47         50         43.7         50         170         500         1.0         0.05         32.9         42.0         51.8         40           MM5Z51VT1G***         1C         48         51         54         47.6         54         180         500         1.0         0.05         35.7         46.6         57.2         40           MM5Z66VT1G***         1D         52         56         60         51.5         60         200         500         1.0         0.05         39.2         52.2         63.8         40           MM5Z68VT1G***         1E         58         62         66         57.4         66         215         500         1.0         0.05         47.6         65.6         79.8         3	MM5Z33VT1G/T5G	18	31	33	35	30.8	35	80	300	1.0	0.05	23.2	27.4	33.4	70
MM5Z43VT1G/T5G       21       40       43       46       39.7       46       150       500       1.0       0.05       30.1       37.6       46.6       40         MM5Z47VT1G/T5G       1A       44       47       50       43.7       50       170       500       1.0       0.05       32.9       42.0       51.8       40         MM5Z51VT1G***       1C       48       51       54       47.6       54       180       500       1.0       0.05       35.7       46.6       57.2       40         MM5Z56VT1G***       1D       52       56       60       51.5       60       200       500       1.0       0.05       39.2       52.2       63.8       40         MM5Z62VT1G***       1E       58       62       66       57.4       66       215       500       1.0       0.05       43.4       58.8       71.6       35         MM5Z68VT1G***       1F       64       68       72       63.4       72       240       500       1.0       0.05       47.6       65.6       79.8       35	MM5Z36VT1G/T5G	19	34	36	38	33.8	38	90	500	1.0	0.05	25.2	30.4	37.4	70
MM5Z47VT1G/T5G       1A       44       47       50       43.7       50       170       500       1.0       0.05       32.9       42.0       51.8       40         MM5Z51VT1G***       1C       48       51       54       47.6       54       180       500       1.0       0.05       35.7       46.6       57.2       40         MM5Z56VT1G***       1D       52       56       60       51.5       60       200       500       1.0       0.05       39.2       52.2       63.8       40         MM5Z68VT1G***       1E       58       62       66       57.4       66       215       500       1.0       0.05       43.4       58.8       71.6       35         MM5Z68VT1G***       1F       64       68       72       63.4       72       240       500       1.0       0.05       47.6       65.6       79.8       35	MM5Z39VT1G/T5G	20	37	39	41	36.7	41	130	500	1.0	0.05	27.3	33.4	41.2	45
MM5Z51VT1G***       1C       48       51       54       47.6       54       180       500       1.0       0.05       35.7       46.6       57.2       40         MM5Z56VT1G***       1D       52       56       60       51.5       60       200       500       1.0       0.05       39.2       52.2       63.8       40         MM5Z62VT1G***       1E       58       62       66       57.4       66       215       500       1.0       0.05       43.4       58.8       71.6       35         MM5Z68VT1G***       1F       64       68       72       63.4       72       240       500       1.0       0.05       47.6       65.6       79.8       35	MM5Z43VT1G/T5G	21	40	43	46	39.7	46	150	500	1.0	0.05	30.1	37.6	46.6	40
MM5Z56VT1G**         1D         52         56         60         51.5         60         200         500         1.0         0.05         39.2         52.2         63.8         40           MM5Z62VT1G***         1E         58         62         66         57.4         66         215         500         1.0         0.05         43.4         58.8         71.6         35           MM5Z68VT1G***         1F         64         68         72         63.4         72         240         500         1.0         0.05         47.6         65.6         79.8         35	MM5Z47VT1G/T5G	1A	44	47	50	43.7	50	170	500	1.0	0.05	32.9	42.0	51.8	40
MM5Z62VT1G**         1E         58         62         66         57.4         66         215         500         1.0         0.05         43.4         58.8         71.6         35           MM5Z68VT1G***         1F         64         68         72         63.4         72         240         500         1.0         0.05         47.6         65.6         79.8         35	MM5Z51VT1G**	1C	48	51	54	47.6	54	180	500	1.0	0.05	35.7	46.6	57.2	40
MM5Z68VT1G** 1F 64 68 72 63.4 72 240 500 1.0 0.05 47.6 65.6 79.8 35	MM5Z56VT1G**	1D	52	56	60	51.5	60	200	500	1.0	0.05	39.2	52.2	63.8	40
	MM5Z62VT1G**	1E	58	62	66	57.4	66	215	500	1.0	0.05	43.4	58.8	71.6	35
MM5Z75VT1G**	MM5Z68VT1G**	1F	64	68	72	63.4	72	240	500	1.0	0.05	47.6	65.6	79.8	35
	MM5Z75VT1G**	1G	70	75	79	69.4	79	255	500	1.0	0.05	52.5	73.4	88.6	35

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.

I<sub>ZT1</sub> = 5 mA: 2.4 to 24 V, I<sub>ZT1</sub> = 2 mA: 27 to 75 V; I<sub>ZT2</sub> = 1 mA: 2.4 to 24 V, I<sub>ZT2</sub> = 0.5 mA: 27 to 75 V.
 Zener voltage is measured with a pulse test current I<sub>Z</sub> at an ambient temperature of 25°C.

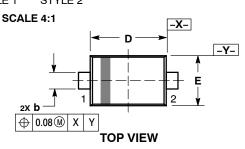
\*Includes SZ-prefix devices where applicable.

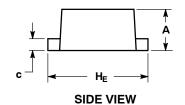
<sup>\*\*</sup>Contact Sales.

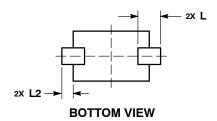


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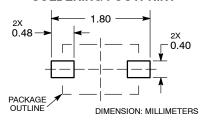
**DATE 28 SEP 2010** 







## **RECOMMENDED SOLDERING FOOTPRINT\***



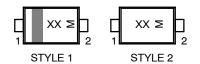
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

#### NOTES:

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

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

## **GENERIC MARKING DIAGRAM\***



XX = Specific Device Code 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.

STYLE 2: NO POLARITY STYLE 1: PIN 1. CATHODE (POLARITY BAND) 2. ANODE

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