

# MM5Z2V4ST1 SERIES

## Zener Voltage Regulators

### 100 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 9.1 V
- Steady State Power Rating of 100 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  $V_Z$
- These devices are manufactured with a Pb-Free external lead finish only.

#### 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-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ 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

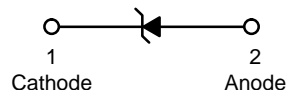
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR-4 Minimum Pad.



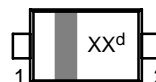
ON Semiconductor®

<http://onsemi.com>



SOD-523  
CASE 502

#### MARKING DIAGRAM



XX = Specific Device Code  
d = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping†
MM5ZxxxST1	SOD-523 (Pb-Free)	3000/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.

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

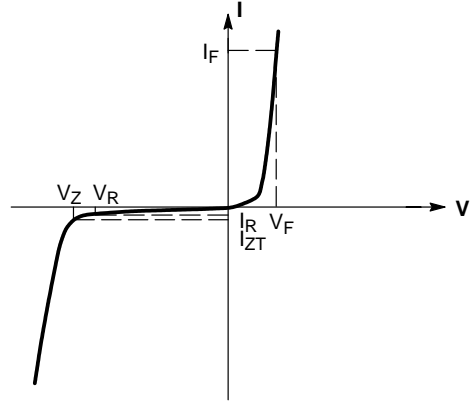
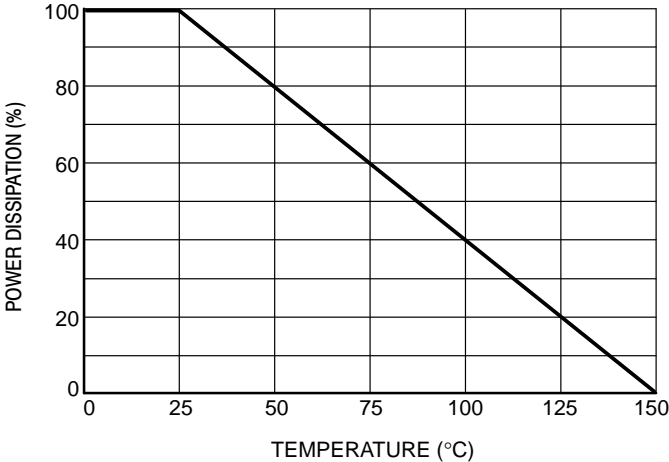


Figure 1. Zener Voltage Regulator

## 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 VZ		$Z_{ZK} I_Z = 0.5\text{ mA } \Omega$ Max	$Z_{ZT} I_Z = I_{ZT} @ 10\% \text{ Mod } \Omega$ Max	Max IR @ VR		$dv_Z/dt$ (mV/k) @ $I_{ZT1} = 5\text{ mA}$		C pF Max @ $V_R = 0$ $f = 1\text{ MHz}$
			Min	Max			$\mu\text{A}$	V	Min	Max	
MM5Z2V4ST1	T2	5.0	2.43	2.63	1000	100	120	1.0	-3.5	0	450
MM5Z2V7ST1	T3	5.0	2.67	2.91	1000	100	100	1.0	-3.5	0	450
MM5Z3V6ST1	T6	5.0	3.60	3.85	1000	90	5.0	1.0	-3.5	0	450
MM5Z3V9ST1	T7	5.0	3.89	4.16	1000	90	3.0	1.0	-3.5	-2.5	450
MM5Z4V3ST1	T8	5.0	4.17	4.43	1000	90	3.0	1.0	-3.5	0	450
MM5Z4V7ST1	T9	5.0	4.55	4.75	800	80	3.0	2.0	-3.5	0.2	260
MM5Z5V1ST1	TA	5.0	4.98	5.2	500	60	2.0	2.0	-2.7	1.2	225
MM5Z5V6ST1	TC	5.0	5.49	5.73	200	40	1.0	2.0	-2.0	2.5	200
MM5Z6V2ST1	TE	5.0	6.06	6.33	100	10	3.0	4.0	0.4	3.7	185
MM5Z6V8ST1	TF	5.0	6.65	6.93	160	15	2.0	4.0	1.2	4.5	155
MM5Z7V5ST1	TG	5.0	7.28	7.6	160	15	1.0	5.0	2.5	5.3	140
MM5Z8V2ST1	TH	5.0	8.02	8.36	160	15	0.7	5.0	3.2	6.2	1358
MM5Z9V1ST1	TK	5.0	8.85	9.23	160	15	0.5	6.0	3.8	7.0	130

**MM5Z2V4ST1 SERIES**

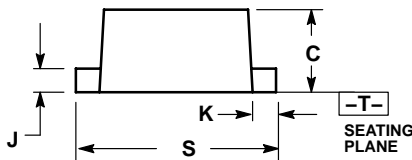
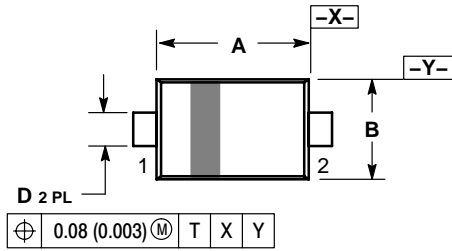


**Figure 2. Steady State Power Derating**

# MM5Z2V4ST1 SERIES

## PACKAGE DIMENSIONS

SOD-523  
CASE 502-01  
ISSUE A

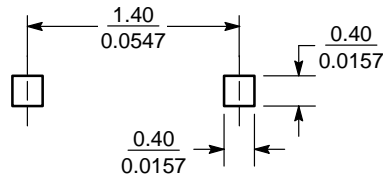


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.10	1.20	1.30	0.043	0.047	0.051
B	0.70	0.80	0.90	0.028	0.032	0.035
C	0.50	0.60	0.70	0.020	0.024	0.028
D	0.25	0.30	0.35	0.010	0.012	0.014
J	0.07	0.14	0.20	0.0028	0.0055	0.0079
K	0.15	0.20	0.25	0.006	0.008	0.010
S	1.50	1.60	1.70	0.059	0.063	0.067

### 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.

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