

Zener Voltage Regulators

200 mW SOD-523 Surface Mount

- We declare that the material of product compliance with RoHS requirements and Halogen Free.

ORDERING INFORMATION

Device	Package	Shipping
M5Zxx Series	SOD-523	3000/Tape&Reel

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 – 2.0 V to 75 V
- Steady State Power Rating of 200 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
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

Mechanical Characteristics:

CASE: Void-free, transfer-molded,thermosetting plastic
Epoxy Meets UL 94 V-0

LEAD FINISH: 100% Matte Sn (Tin)

QUALIFIED MAX REFLOW TEMPERATURE:260°C

Device Meets MSL 1 Requirements

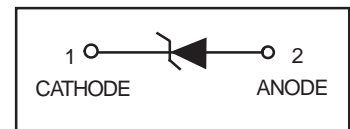
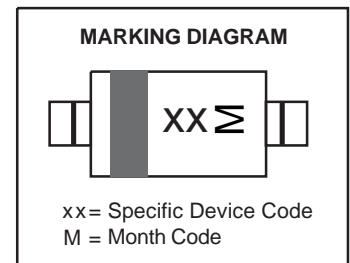
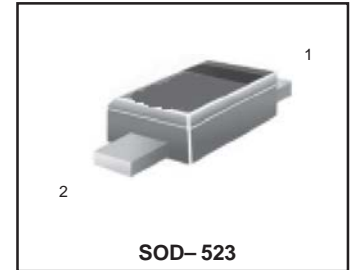
MOUNTING POSITION: Any

MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, @ T _A = 25°C	P _D	200	mW
Thermal Resistance Junction-to-Ambient	R _{θJA}	635	°C/W
Junction-to-Case	R _{θJC}	350	°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.

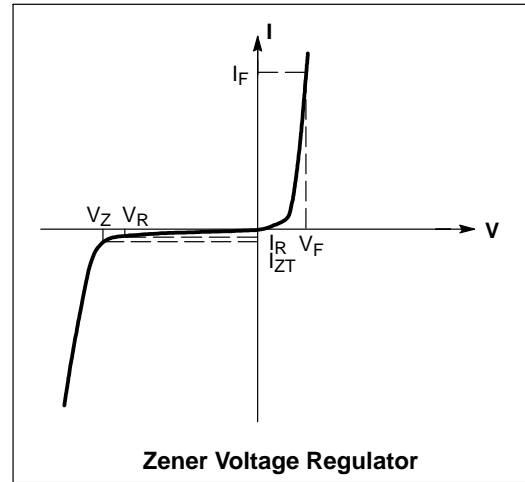
M5Zxx Series S-M5Zxx Series



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



M5Zxx Series , S-M5Zxx 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)

Device	Device Marking	Zener Voltage (Note 1)				Zener Impedance			Leakage Current		θ_{VZ} (mV/k) @ I_{ZT}		C @ $V_R = 0$ f = 1 MHz
		V_Z (Volts)			@ I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}		I_R @ V_R		Min	Max	
		Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts	Min	Max	pF
M5Z2V0	WY	1.91	2.0	2.09	5	100	600	1.0	150	1.0	-3.5	0	450
M5Z2V4	00	2.2	2.4	2.6	5	100	1000	1.0	50	1.0	-3.5	0	450
M5Z2V7	01	2.5	2.7	2.9	5	100	1000	1.0	20	1.0	-3.5	0	450
M5Z3V0	02	2.8	3.0	3.2	5	100	1000	1.0	10	1.0	-3.5	0	450
M5Z3V3	05	3.1	3.3	3.5	5	95	1000	1.0	5	1.0	-3.5	0	450
M5Z3V6	06	3.4	3.6	3.8	5	90	1000	1.0	5	1.0	-3.5	0	450
M5Z3V9	07	3.7	3.9	4.1	5	90	1000	1.0	3	1.0	-3.5	-2.5	450
M5Z4V3	08	4.0	4.3	4.6	5	90	1000	1.0	3	1.0	-3.5	0	450
M5Z4V7	09	4.4	4.7	5.0	5	80	800	1.0	3	2.0	-3.5	0.2	260
M5Z5V1	0A	4.8	5.1	5.4	5	60	500	1.0	2	2.0	-2.7	1.2	225
M5Z5V6	0C	5.2	5.6	6.0	5	40	400	1.0	1	2.0	-2.0	2.5	200
M5Z6V2	0E	5.8	6.2	6.6	5	10	100	1.0	3	4.0	0.4	3.7	185
M5Z6V8	0F	6.4	6.8	7.2	5	15	160	1.0	2	4.0	1.2	4.5	155
M5Z7V5	0G	7.0	7.5	7.9	5	15	160	1.0	1	5.0	2.5	5.3	140
M5Z8V2	0H	7.7	8.2	8.7	5	15	160	1.0	0.7	5.0	3.2	6.2	135
M5Z9V1	0K	8.5	9.1	9.6	5	15	160	1.0	0.2	7.0	3.8	7.0	130
M5Z10V	0L	9.4	10	10.6	5	20	160	1.0	0.1	8.0	4.5	8.0	130
M5Z11V	0M	10.4	11	11.6	5	20	160	1.0	0.1	8.0	5.4	9.0	130
M5Z12V	0N	11.4	12	12.7	5	25	80	1.0	0.1	8.0	6.0	10	130
M5Z13V	0P	12.4	13.25	14.1	5	30	80	1.0	0.1	8.0	7.0	11	120
M5Z15V	0T	14.3	15	15.8	5	30	200	1.0	0.05	10.5	9.2	13	110
M5Z16V	0U	15.3	16.2	17.1	2	40	200	1.0	0.05	11.2	10.4	14	105
M5Z18V	0W	16.8	18	19.1	2	45	225	1.0	0.05	12.6	12.4	16	100
M5Z20V	0Z	18.8	20	21.2	2	55	225	1.0	0.05	14.0	14.4	18	85
M5Z22V	10	20.8	22	23.3	2	55	250	1.0	0.05	15.4	16.4	20	85
M5Z24V	11	22.8	24.2	25.6	2	70	120	1.0	0.05	16.8	18.4	22	80
M5Z27V	12	25.1	27	28.9	2	80	300	1.0	0.05	18.9	21.4	25.3	70
M5Z30V	14	28	30	32	2	80	300	1.0	0.05	21.0	24.4	29.4	70
M5Z33V	18	31	33	35	2	80	300	1.0	0.05	23.2	27.4	33.4	70
M5Z36V	19	34	36	38	2	90	500	1.0	0.05	25.2	30.4	37.4	70
M5Z39V	20	37	39	41	2	130	500	1.0	0.05	27.3	33.4	41.2	45
M5Z43V	21	40	43	46	2	150	500	1.0	0.05	30.1	37.6	46.6	40
M5Z47V	1A	44	47	50	2	170	500	1.0	0.05	32.9	42.0	51.8	40
M5Z51V	1C	48	51	54	2	180	500	1.0	0.05	35.7	46.6	57.2	40
M5Z56V	1D	52	56	60	2	200	500	1.0	0.05	39.2	52.2	63.8	40
M5Z62V	1E	58	62	66	2	215	500	1.0	0.05	43.4	58.8	71.6	35
M5Z68V	1F	64	68	72	2	240	500	1.0	0.05	47.6	65.6	79.8	35
M5Z75V	1G	70	75	79	2	255	500	1.0	0.05	52.5	73.4	88.6	35

1. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C .



Typical Characteristics

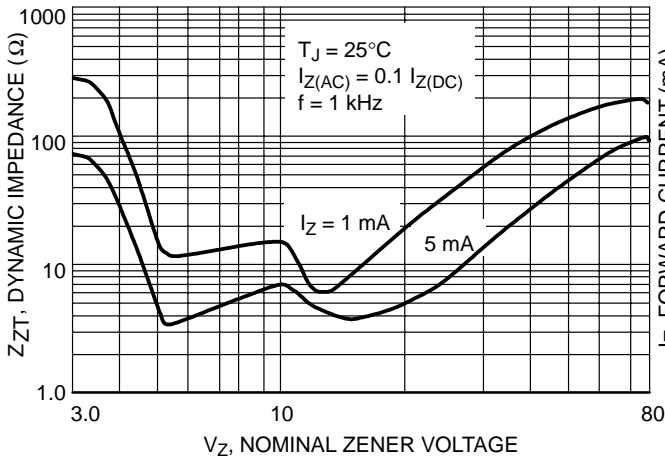


Figure 1. Effect of Zener Voltage on Zener Impedance

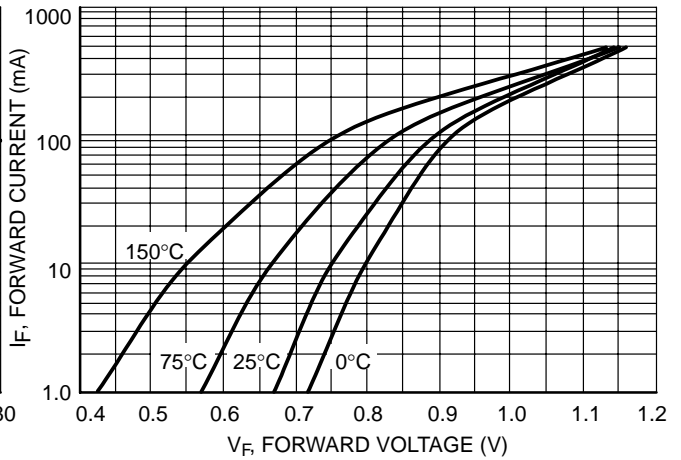


Figure 2. Typical Forward Voltage

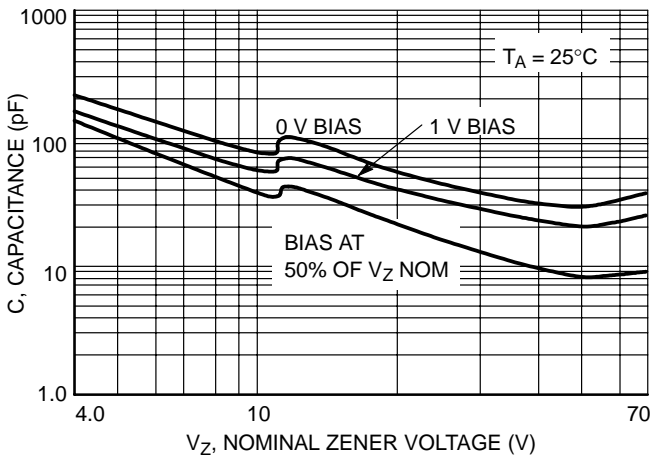


Figure 3. Typical Capacitance

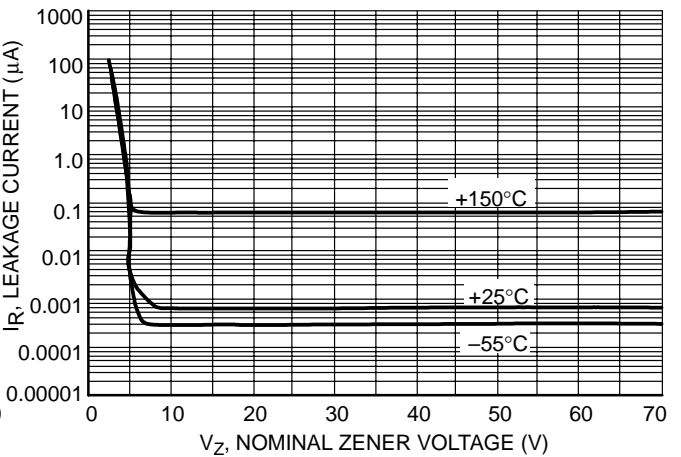


Figure 4. Typical Leakage Current



Typical Characteristics

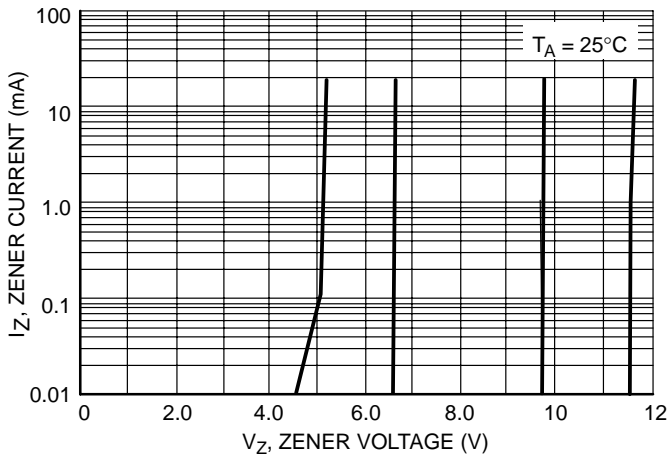


Figure 5. Zener Voltage versus Zener Current (V_Z Up to 12 V)

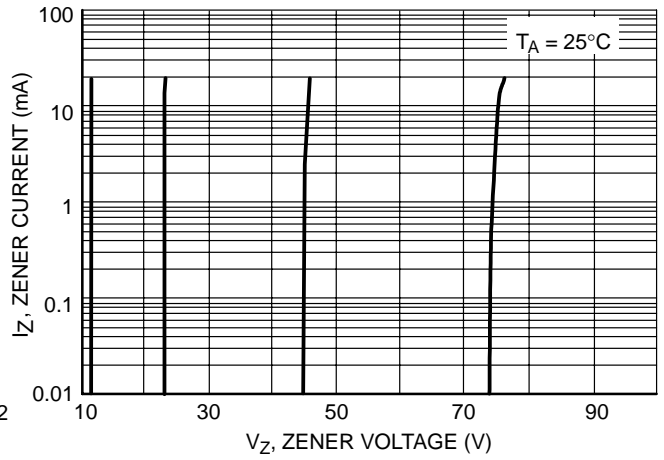


Figure 6. Zener Voltage versus Zener Current (12 V to 75 V)

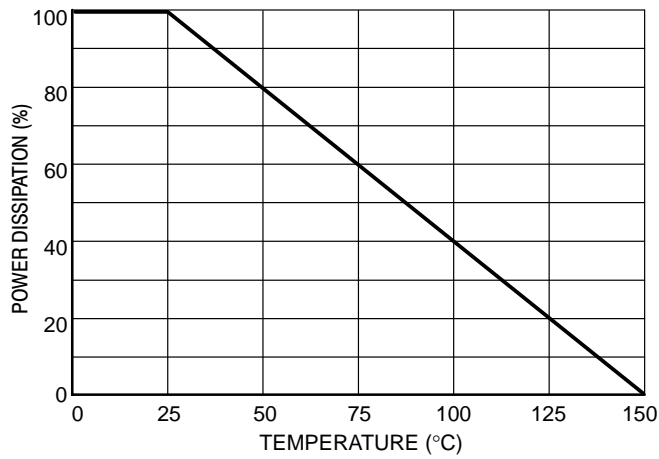
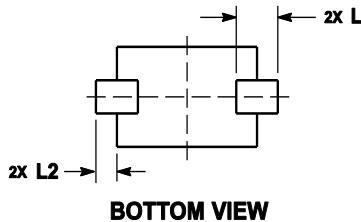
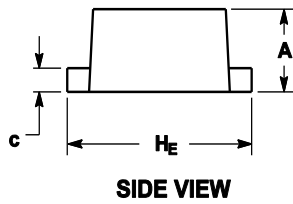
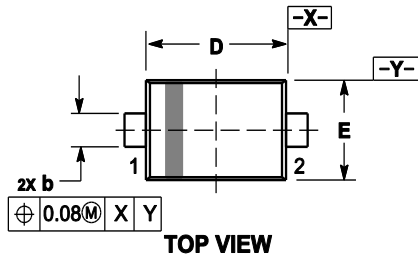


Figure 7. Steady State Power Derating



OUTLINE AND DIMENSIONS



Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
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			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.60	0.70	0.020	0.024	0.028
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.07	0.14	0.20	0.003	0.006	0.008
D	1.10	1.20	1.30	0.043	0.047	0.051
E	0.70	0.80	0.90	0.028	0.031	0.035
H _E	1.50	1.60	1.70	0.059	0.063	0.067
L	0.30 REF			0.012 REF		
L ₂	0.15	0.20	0.25	0.006	0.008	0.010

SOLDERING FOOTPRINT

