

# 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
LM5Z2V0T1G Series	SOD-523	3000/Tape&Reel
LM5Z2V0T5G Series	SOD-523	8000/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

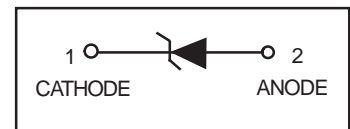
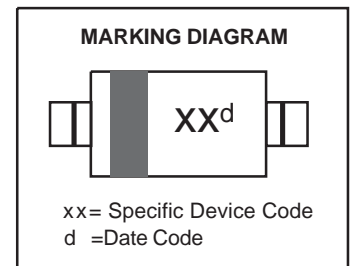
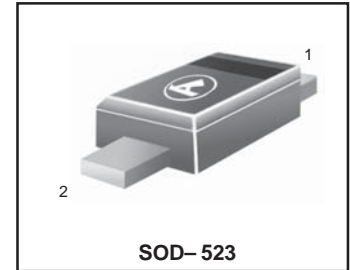
**MOUNTING POSITION:** Any

### MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, @ T <sub>A</sub> = 25°C	P <sub>D</sub>	200	mW
Thermal Resistance Junction-to-Ambient	R <sub>θJA</sub>	635	°C/W
Junction-to-Case	R <sub>θJC</sub>	350	°C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-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.

## LM5Z2V0T1G Series S-LM5Z2V0T1G Series

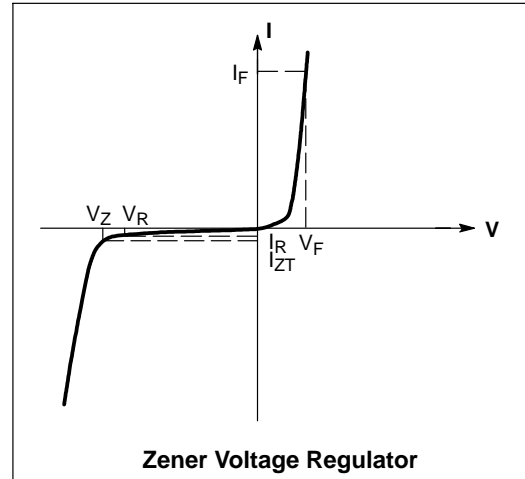


LM5Z2V0T1G Series , S-LM5Z2V0T1G Series

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



LM5Z2V0T1G Series , S-LM5Z2V0T1G Series

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted, V<sub>F</sub> = 0.9 V Max. @ I<sub>F</sub> = 10 mA for all types)

Device	Device Marking	Zener Voltage (Note 1)				Zener Impedance			Leakage Current		θV <sub>Z</sub> (mV/k) @ I <sub>ZT</sub>		C @ V <sub>R</sub> = 0 f = 1 MHz
		V <sub>Z</sub> (Volts)			@ I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>		I <sub>R</sub> @ V <sub>R</sub>		Min	Max	pF
		Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts			
LM5Z2V0T1G	WY	1.91	2.0	2.09	5	100	600	1.0	150	1.0	-3.5	0	450
LM5Z2V4T1G	00	2.2	2.4	2.6	5	100	1000	1.0	50	1.0	-3.5	0	450
LM5Z2V7T1G	01	2.5	2.7	2.9	5	100	1000	1.0	20	1.0	-3.5	0	450
LM5Z3V0T1G	02	2.8	3.0	3.2	5	100	1000	1.0	10	1.0	-3.5	0	450
LM5Z3V3T1G	05	3.1	3.3	3.5	5	95	1000	1.0	5	1.0	-3.5	0	450
LM5Z3V6T1G	06	3.4	3.6	3.8	5	90	1000	1.0	5	1.0	-3.5	0	450
LM5Z3V9T1G	07	3.7	3.9	4.1	5	90	1000	1.0	3	1.0	-3.5	-2.5	450
LM5Z4V3T1G	08	4.0	4.3	4.6	5	90	1000	1.0	3	1.0	-3.5	0	450
LM5Z4V7T1G	09	4.4	4.7	5.0	5	80	800	1.0	3	2.0	-3.5	0.2	260
LM5Z5V1T1G	0A	4.8	5.1	5.4	5	60	500	1.0	2	2.0	-2.7	1.2	225
LM5Z5V6T1G	0C	5.2	5.6	6.0	5	40	400	1.0	1	2.0	-2.0	2.5	200
LM5Z6V2T1G	0E	5.8	6.2	6.6	5	10	100	1.0	3	4.0	0.4	3.7	185
LM5Z6V8T1G	0F	6.4	6.8	7.2	5	15	160	1.0	2	4.0	1.2	4.5	155
LM5Z7V5T1G	0G	7.0	7.5	7.9	5	15	160	1.0	1	5.0	2.5	5.3	140
LM5Z8V2T1G	0H	7.7	8.2	8.7	5	15	160	1.0	0.7	5.0	3.2	6.2	135
LM5Z9V1T1G	0K	8.5	9.1	9.6	5	15	160	1.0	0.2	7.0	3.8	7.0	130
LM5Z10VT1G	0L	9.4	10	10.6	5	20	160	1.0	0.1	8.0	4.5	8.0	130
LM5Z11VT1G	0M	10.4	11	11.6	5	20	160	1.0	0.1	8.0	5.4	9.0	130
LM5Z12VT1G	0N	11.4	12	12.7	5	25	80	1.0	0.1	8.0	6.0	10	130
LM5Z13VT1G	0P	12.4	13.25	14.1	5	30	80	1.0	0.1	8.0	7.0	11	120
LM5Z15VT1G	0T	14.3	15	15.8	5	30	200	1.0	0.05	10.5	9.2	13	110
LM5Z16VT1G	0U	15.3	16.2	17.1	2	40	200	1.0	0.05	11.2	10.4	14	105
LM5Z18VT1G	0W	16.8	18	19.1	2	45	225	1.0	0.05	12.6	12.4	16	100
LM5Z20VT1G	0Z	18.8	20	21.2	2	55	225	1.0	0.05	14.0	14.4	18	85
LM5Z22VT1G	10	20.8	22	23.3	2	55	250	1.0	0.05	15.4	16.4	20	85
LM5Z24VT1G	11	22.8	24.2	25.6	2	70	120	1.0	0.05	16.8	18.4	22	80
LM5Z27VT1G	12	25.1	27	28.9	2	80	300	1.0	0.05	18.9	21.4	25.3	70
LM5Z30VT1G	14	28	30	32	2	80	300	1.0	0.05	21.0	24.4	29.4	70
LM5Z33VT1G	18	31	33	35	2	80	300	1.0	0.05	23.2	27.4	33.4	70
LM5Z36VT1G	19	34	36	38	2	90	500	1.0	0.05	25.2	30.4	37.4	70
LM5Z39VT1G	20	37	39	41	2	130	500	1.0	0.05	27.3	33.4	41.2	45
LM5Z43VT1G	21	40	43	46	2	150	500	1.0	0.05	30.1	37.6	46.6	40
LM5Z47VT1G	1A	44	47	50	2	170	500	1.0	0.05	32.9	42.0	51.8	40
LM5Z51VT1G	1C	48	51	54	2	180	500	1.0	0.05	35.7	46.6	57.2	40
LM5Z56VT1G	1D	52	56	60	2	200	500	1.0	0.05	39.2	52.2	63.8	40
LM5Z62VT1G	1E	58	62	66	2	215	500	1.0	0.05	43.4	58.8	71.6	35
LM5Z68VT1G	1F	64	68	72	2	240	500	1.0	0.05	47.6	65.6	79.8	35
LM5Z75VT1G	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<sub>Z</sub> at an ambient temperature of 25°C.

LM5Z2V0T1G Series , S-LM5Z2V0T1G Series

Typical Characteristics

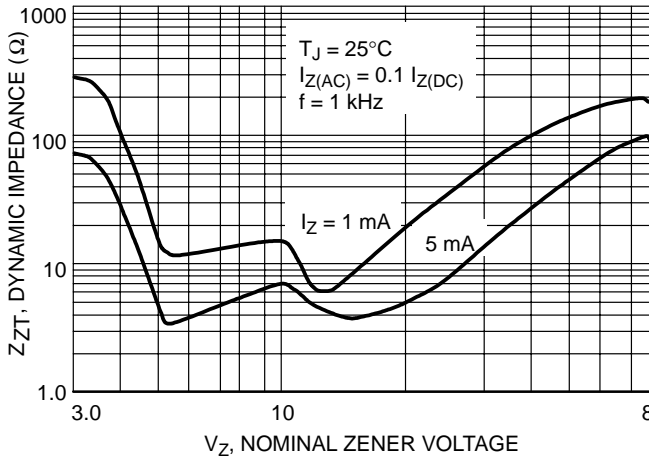


Figure 1. Effect of Zener Voltage on Zener Impedance

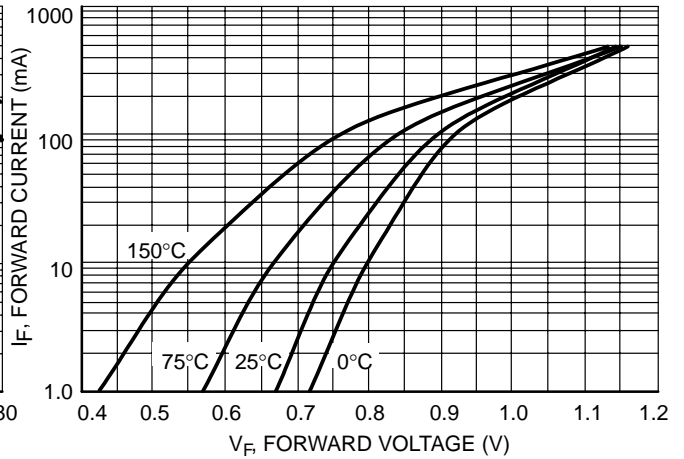


Figure 2. Typical Forward Voltage

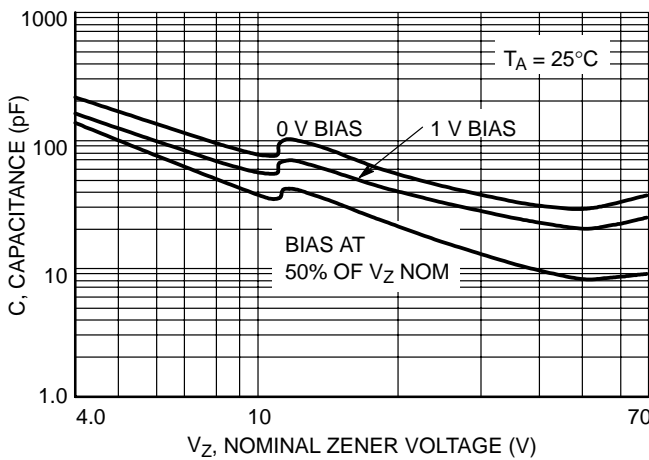


Figure 3. Typical Capacitance

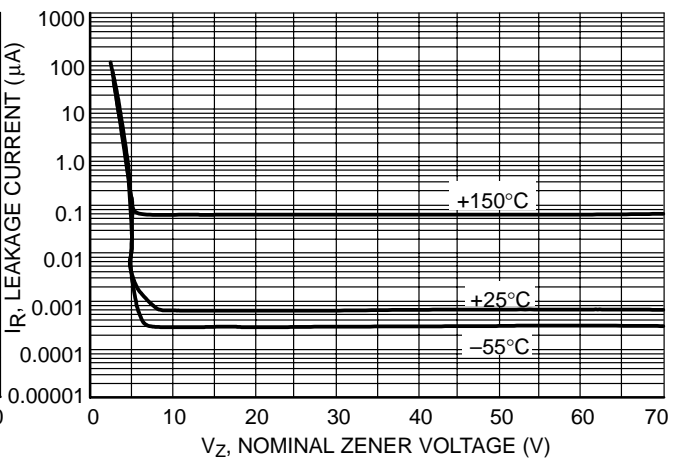


Figure 4. Typical Leakage Current

LM5Z2V0T1G Series , S-LM5Z2V0T1G Series

Typical Characteristics

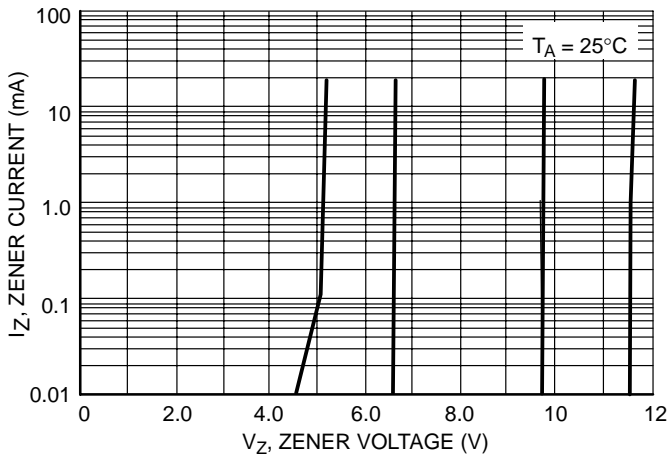


Figure 5. Zener Voltage versus Zener Current (V<sub>Z</sub> Up to 12 V)

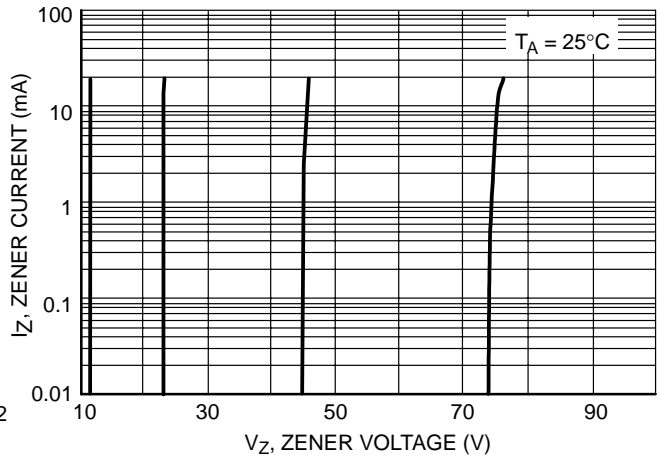


Figure 6. Zener Voltage versus Zener Current (12 V to 75 V)

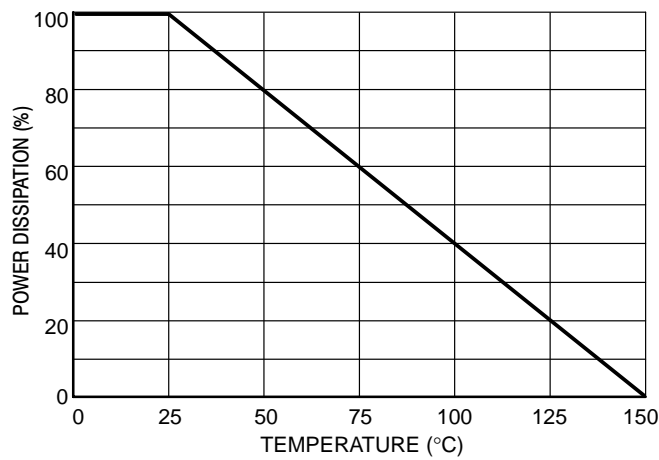
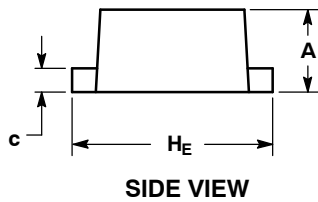
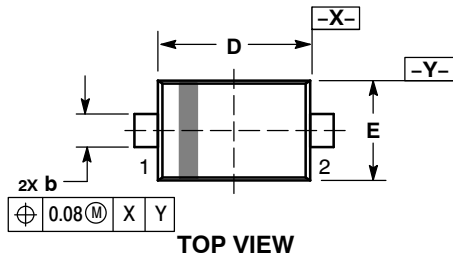


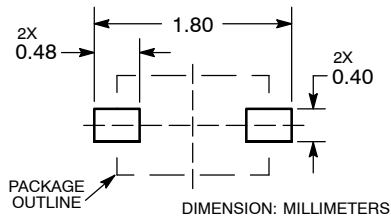
Figure 7. Steady State Power Derating

LM5Z2V0T1G Series , S-LM5Z2V0T1G Series

SC-79/SOD-523



**RECOMMENDED  
SOLDERING FOOTPRINT\***



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
HE	1.50	1.60	1.70
L	0.30 REF		
L2	0.15	0.20	0.25