

## Zener Voltage Regulators

### 200 mW SOD-323 Surface Mount

#### Specification Features:

- Standard Zener Breakdown Voltage Range – 2.0 V to 75 V
- Steady State Power Rating of 200 mW
- Small Body Outline Dimensions: 0.067" x 0.049" (1.7 mm x 1.25 mm)
- Low Body Height: 0.035" (0.9 mm)
- Package Weight: 4.507 mg/unit
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Pb-Free package is available.

#### Mechanical Characteristics:

**CASE:** Void-free, transfer-molded plastic

**FINISH:** All external surfaces are corrosion resistant

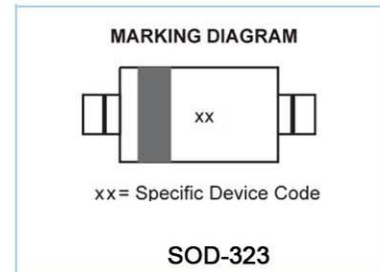
#### MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

**POLARITY:** Cathode indicated by polarity band

**FLAMMABILITY RATING:** UL94 V-0

**MOUNTING POSITION:** Any



#### MAXIMUM RATINGS

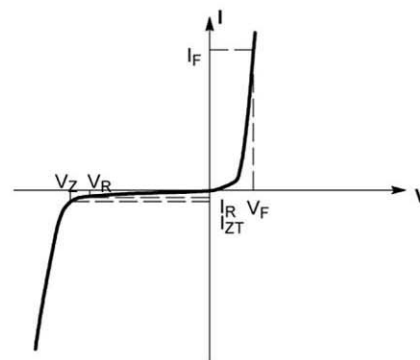
Rating	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1.) @ TA = 25°C Derate above 25°C	P <sub>D</sub>	200 1.5	mW mW/°C
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	635	°C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to+150	°C

1. FR-4 Minimum Pad

#### 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)

Symbol	Parameter
V <sub>Z</sub>	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>
C	Max. Capacitance @ V <sub>R</sub> = 0 and f = 1 MHz



Zener Voltage Regulator

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REV.07



**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 2.)			Zener Impedance			Leakage Current		$\theta_{V_Z}$ (mV/k) @ $I_{ZT}$		C @ $V_R = 0$ f = 1 MHz pF	
		$V_Z$ (Volts)			$@ I_{ZT}$	$Z_{ZT}$ @ $I_{ZT}$	$Z_{ZK}$ @ $I_{ZK}$	$I_R$ @ $V_R$		Min	Max		
		Min	Nom	Max	mA	$\Omega$	$\Omega$	$\mu\text{A}$	Volts	Min	Max		
MM3Z2V0	WY	1.91	2.0	2.09	5	100	600	1.0	150	1.0	-3.5	0	450
MM3Z2V4	00	2.2	2.4	2.6	5	100	1000	0.5	50	1.0	-3.5	0	450
MM3Z2V7	01	2.5	2.7	2.9	5	100	1000	0.5	20	1.0	-3.5	0	450
MM3Z3V0	02	2.8	3.0	3.2	5	100	1000	0.5	10	1.0	-3.5	0	450
MM3Z3V3	05	3.1	3.3	3.5	5	95	1000	0.5	5	1.0	-3.5	0	450
MM3Z3V6	06	3.4	3.6	3.8	5	90	1000	0.5	5	1.0	-3.5	0	450
MM3Z3V9	07	3.7	3.9	4.1	5	90	1000	0.5	3	1.0	-3.5	-2.5	450
MM3Z4V3	08	4.0	4.3	4.6	5	90	1000	0.5	3	1.0	-3.5	0	450
MM3Z4V7	09	4.4	4.7	5.0	5	80	800	0.5	3	2.0	-3.5	0.2	260
MM3Z5V1	0A	4.8	5.1	5.4	5	60	800	0.5	2	2.0	-2.7	1.2	225
MM3Z5V6	0C	5.2	5.6	6.0	5	40	700	0.5	1	2.0	-2.0	2.5	200
MM3Z6V2	0E	5.8	6.2	6.6	5	10	100	0.5	3	4.0	0.4	3.7	185
MM3Z6V8	0F	6.4	6.8	7.2	5	15	160	0.5	2	4.0	1.2	4.5	155
MM3Z7V5	0G	7.0	7.5	7.9	5	15	160	0.5	1	5.0	2.5	5.3	140
MM3Z8V2	0H	7.7	8.2	8.7	5	15	160	0.5	0.7	5.0	3.2	6.2	135
MM3Z9V1	0K	8.5	9.1	9.6	5	15	160	0.5	0.2	7.0	3.8	7.0	130
MM3Z10V	0L	9.4	10	10.6	5	20	160	0.5	0.1	8.0	4.5	8.0	130
MM3Z11V	0M	10.4	11	11.6	5	20	160	0.5	0.1	8.0	5.4	9.0	130
MM3Z12V	0N	11.4	12	12.7	5	25	80	0.5	0.1	8.0	6.0	10	130
MM3Z13V	0P	12.4	13.25	14.1	5	30	80	0.5	0.1	8.0	7.0	11	120
MM3Z15V	0T	14.3	15	15.8	5	30	400	0.5	0.05	10.5	9.2	13	110
MM3Z16V	0U	15.3	16.2	17.1	5	40	400	0.5	0.05	11.2	10.4	14	105
MM3Z18V	0W	16.8	18	19.1	5	45	400	0.5	0.05	12.6	12.4	16	100
MM3Z20V	0Z	18.8	20	21.2	5	55	500	0.5	0.05	14.0	14.4	18	85
MM3Z22V	10	20.8	22	23.3	5	55	500	0.5	0.05	15.4	16.4	20	85
MM3Z24V	11	22.8	24.2	25.6	5	70	120	0.5	0.05	16.8	18.4	22	80
MM3Z27V	12	25.1	27	28.9	2	80	300	0.5	0.05	18.9	21.4	25.3	70
MM3Z30V	14	28	30	32	2	80	300	0.5	0.05	21.0	24.4	29.4	70
MM3Z33V	18	31	33	35	2	80	300	0.5	0.05	23.2	27.4	33.4	70
MM3Z36V	19	34	36	38	2	90	500	0.5	0.05	25.2	30.4	37.4	70
MM3Z39V	20	37	39	41	2	130	500	0.5	0.05	27.3	33.4	41.2	45
MM3Z43V	21	40	43	46	2	150	500	0.5	0.05	30.1	37.6	46.6	40
MM3Z47V	1A	44	47	50	2	170	500	0.5	0.05	32.9	42.0	51.8	40
MM3Z51V	1C	48	51	54	2	180	500	0.5	0.05	35.7	46.6	57.2	40
MM3Z56V	1D	52	56	60	2	200	500	0.5	0.05	39.2	52.2	63.8	40
MM3Z62V	1E	58	62	66	2	215	500	0.5	0.05	43.4	58.8	71.6	35
MM3Z68V	1F	64	68	72	2	240	500	0.5	0.05	47.6	65.6	79.8	35
MM3Z75V	1G	70	75	79	2	255	500	0.5	0.05	52.5	73.4	88.6	35

2. Zener voltage is measured with a pulse test current  $I_Z$  at an ambient temperature of  $25^\circ\text{C}$ .



## Typical Characteristics

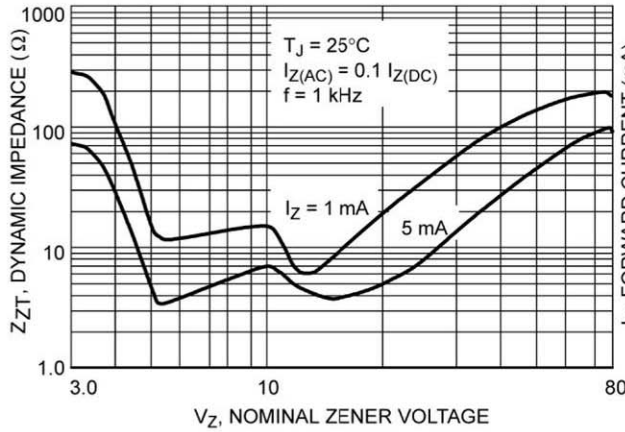


Figure 1. Effect of Zener Voltage on Zener Impedance

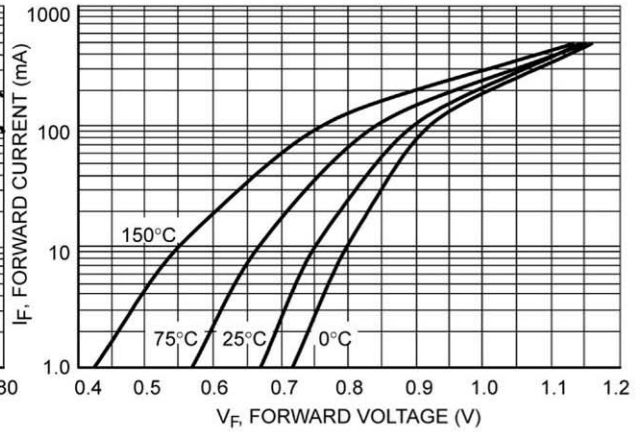


Figure 2. Typical Forward Voltage

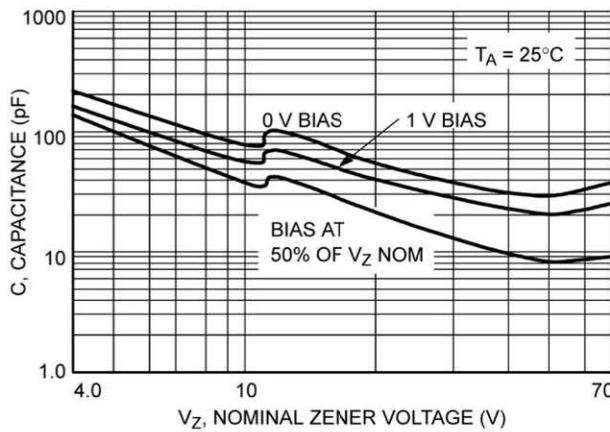


Figure 3. Typical Capacitance

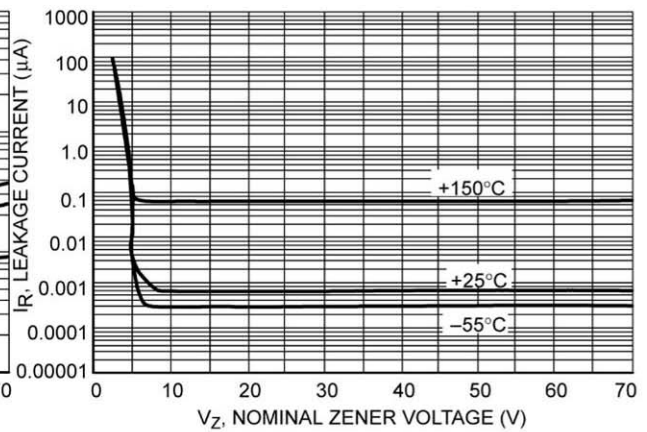


Figure 4. Typical Leakage Current



## Typical Characteristics

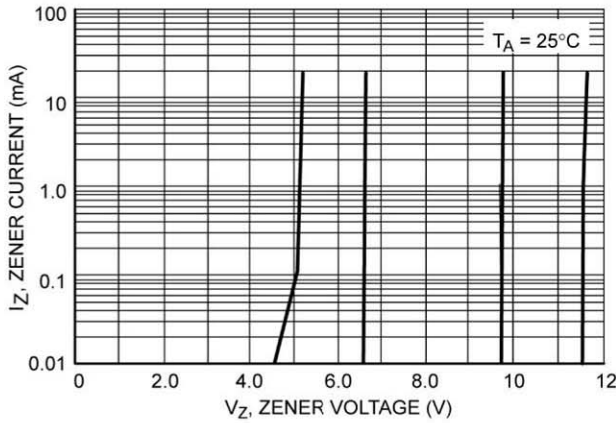


Figure 5. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)

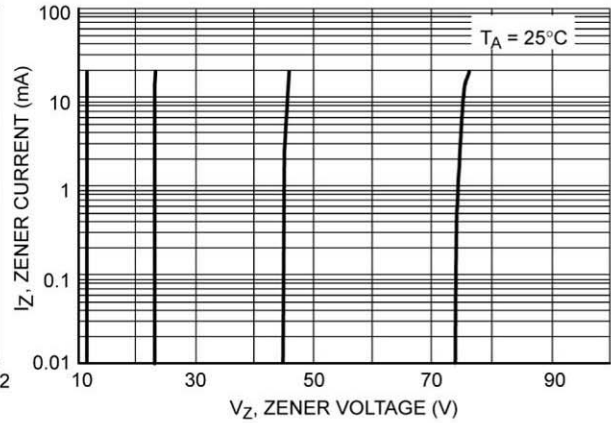


Figure 6. Zener Voltage versus Zener Current  
(12 V to 75 V)

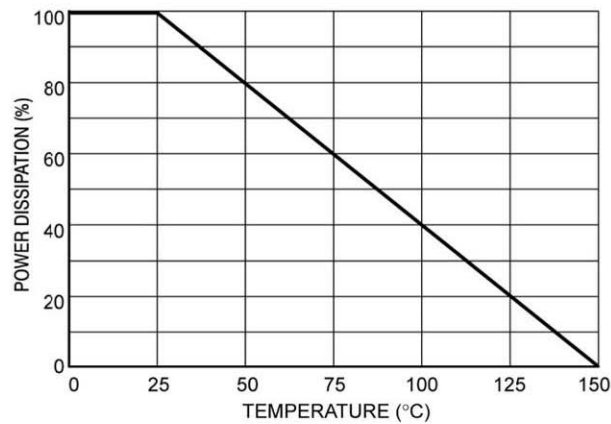


Figure 7. Steady State Power Derating



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