



## 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



## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MM5ZXX	SOD-523 (SOD-523F)	XX	3000

XX=Device code, see table on page2 the marking code.

The marking bar indicates the cathode.

SOD-523  
(SOD-523F)



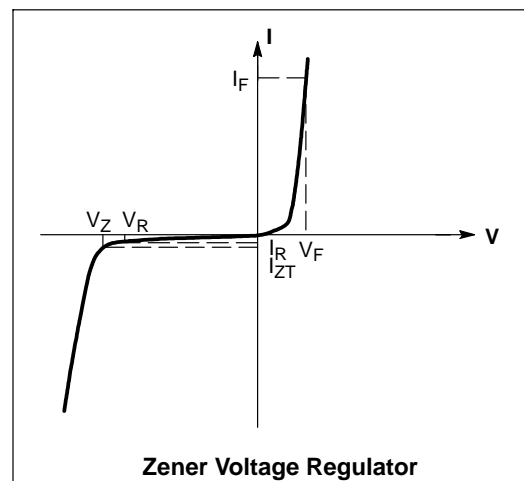
## Absolute Maximum Ratings(Ta=25°C)

Rating	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, @ T <sub>A</sub> = 25°C	P <sub>D</sub>	200	mW
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to +150	°C

## 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





**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		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	Nom	Max	mA	Ω	Ω	mA	μA	Volts	Min	Max	pF
MM5Z2V0	WY	1.91	2.0	2.09	5	100	600	1.0	150	1.0	-3.5	0	450
MM5Z2V4	00	2.2	2.4	2.6	5	100	1000	1.0	50	1.0	-3.5	0	450
MM5Z2V7	01	2.5	2.7	2.9	5	100	1000	1.0	20	1.0	-3.5	0	450
MM5Z3V0	02	2.8	3.0	3.2	5	100	1000	1.0	10	1.0	-3.5	0	450
MM5Z3V3	05	3.1	3.3	3.5	5	95	1000	1.0	5	1.0	-3.5	0	450
MM5Z3V6	06	3.4	3.6	3.8	5	90	1000	1.0	5	1.0	-3.5	0	450
MM5Z3V9	07	3.7	3.9	4.1	5	90	1000	1.0	3	1.0	-3.5	-2.5	450
MM5Z4V3	08	4.0	4.3	4.6	5	90	1000	1.0	3	1.0	-3.5	0	450
MM5Z4V7	09	4.4	4.7	5.0	5	80	800	1.0	3	2.0	-3.5	0.2	260
MM5Z5V1	0A	4.8	5.1	5.4	5	60	500	1.0	2	2.0	-2.7	1.2	225
MM5Z5V6	W9	5.2	5.6	6.0	5	40	400	1.0	1	2.0	-2.0	2.5	200
MM5Z6V2	0E	5.8	6.2	6.6	5	10	100	1.0	3	4.0	0.4	3.7	185
MM5Z6V8	0F	6.4	6.8	7.2	5	15	160	1.0	2	4.0	1.2	4.5	155
MM5Z7V5	0G	7.0	7.5	7.9	5	15	160	1.0	1	5.0	2.5	5.3	140
MM5Z8V2	0H	7.7	8.2	8.7	5	15	160	1.0	0.7	5.0	3.2	6.2	135
MM5Z9V1	0K	8.5	9.1	9.6	5	15	160	1.0	0.2	7.0	3.8	7.0	130
MM5Z10V	0L	9.4	10	10.6	5	20	160	1.0	0.1	8.0	4.5	8.0	130
MM5Z11V	0M	10.4	11	11.6	5	20	160	1.0	0.1	8.0	5.4	9.0	130
MM5Z12V	0N	11.4	12	12.7	5	25	80	1.0	0.1	8.0	6.0	10	130
MM5Z13V	0P	12.4	13.25	14.1	5	30	80	1.0	0.1	8.0	7.0	11	120
MM5Z15V	0T	14.3	15	15.8	5	30	200	1.0	0.05	10.5	9.2	13	110
MM5Z16V	0U	15.3	16.2	17.1	2	40	200	1.0	0.05	11.2	10.4	14	105
MM5Z18V	0W	16.8	18	19.1	2	45	225	1.0	0.05	12.6	12.4	16	100
MM5Z20V	0Z	18.8	20	21.2	2	55	225	1.0	0.05	14.0	14.4	18	85
MM5Z22V	10	20.8	22	23.3	2	55	250	1.0	0.05	15.4	16.4	20	85
MM5Z24V	11	22.8	24.2	25.6	2	70	120	1.0	0.05	16.8	18.4	22	80
MM5Z27V	12	25.1	27	28.9	2	80	300	1.0	0.05	18.9	21.4	25.3	70
MM5Z30V	14	28	30	32	2	80	300	1.0	0.05	21.0	24.4	29.4	70
MM5Z33V	18	31	33	35	2	80	300	1.0	0.05	23.2	27.4	33.4	70
MM5Z36V	19	34	36	38	2	90	500	1.0	0.05	25.2	30.4	37.4	70
MM5Z39V	20	37	39	41	2	130	500	1.0	0.05	27.3	33.4	41.2	45

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



## Typical Characteristics

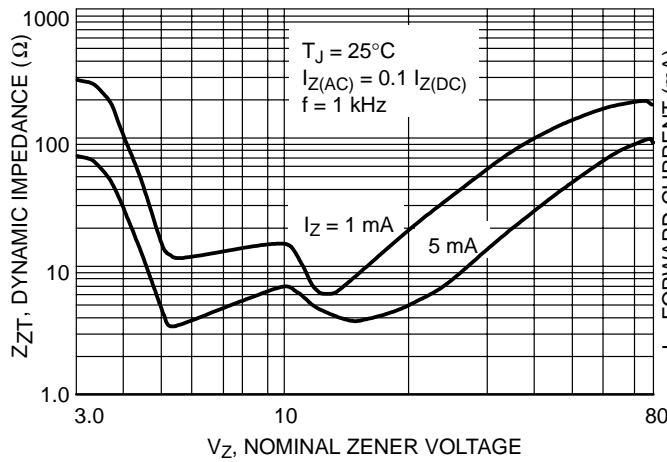


Figure 1. Effect of Zener Voltage on Zener Impedance

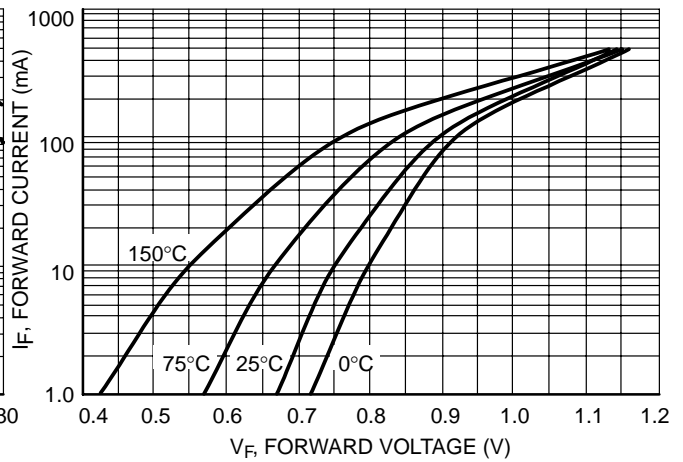


Figure 2. Typical Forward Voltage

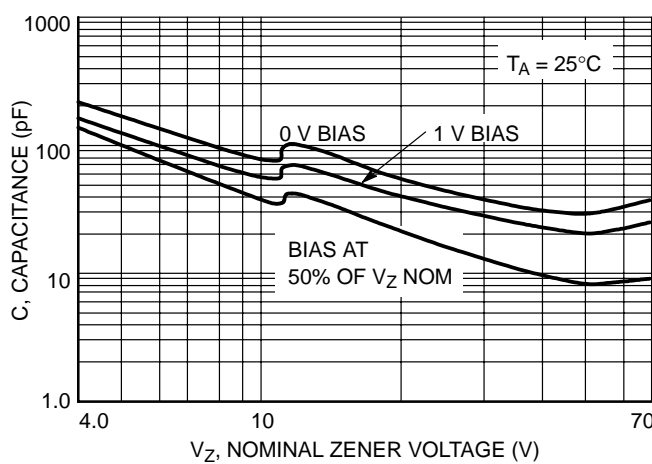


Figure 3. Typical Capacitance

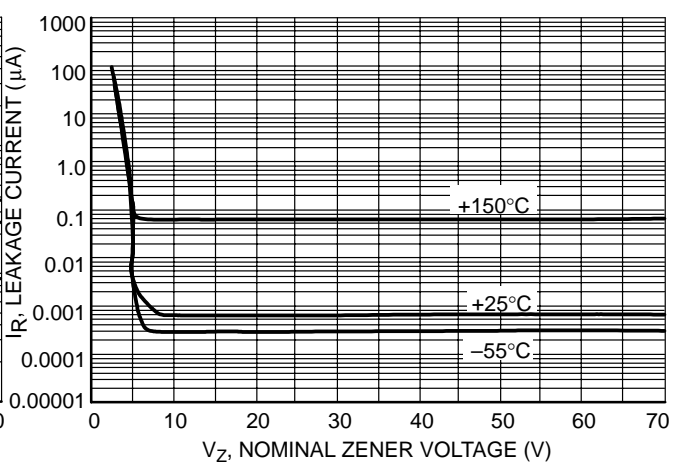


Figure 4. Typical Leakage Current



## Typical Characteristics

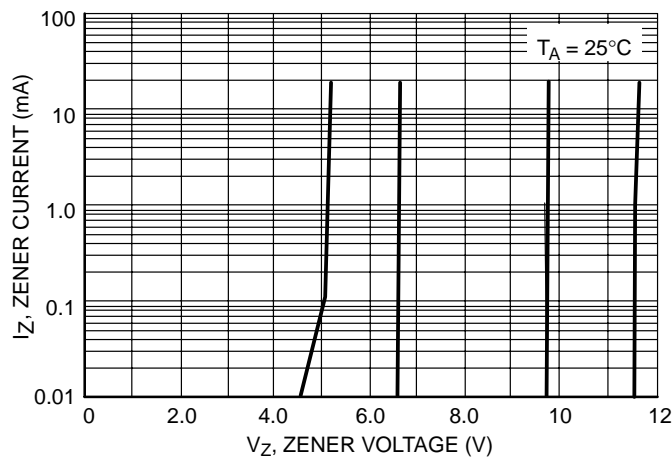


Figure 5. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)

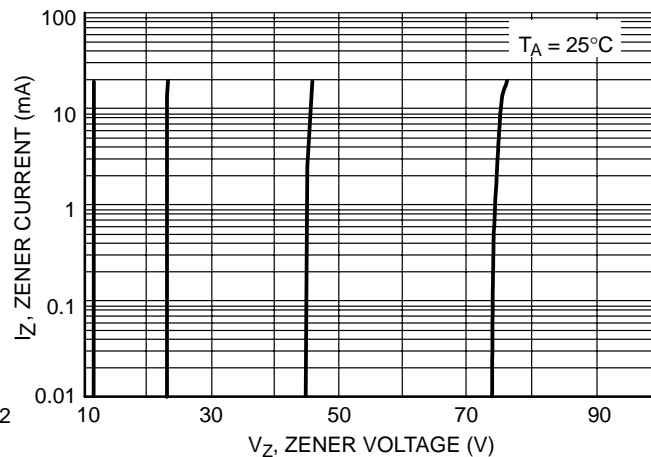


Figure 6. Zener Voltage versus Zener Current  
(12 V to 75 V)

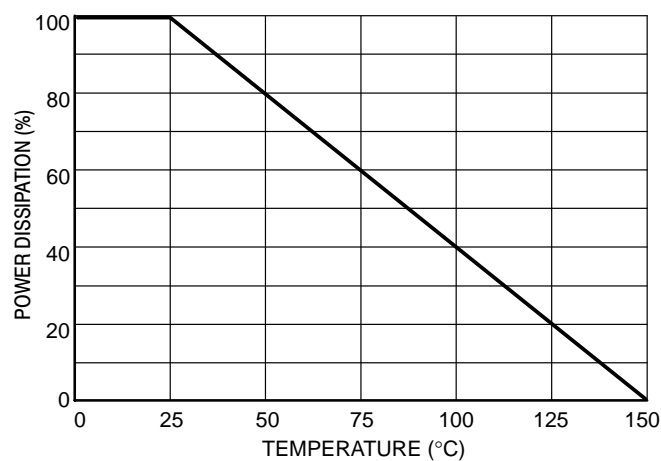
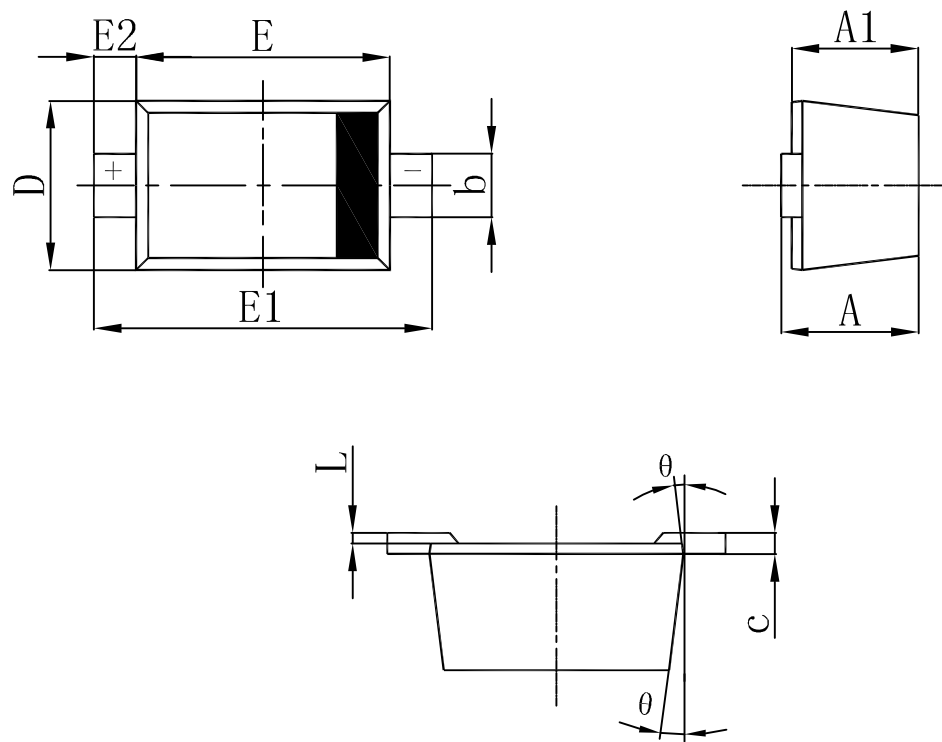


Figure 7. Steady State Power Derating



SOD-523(SOD-523F) Package Outline Dimensions



Sym ol	imensions In Millimeters		imensions In Inches	
	Min	Max	Min	Max
A	0.510	0.770	0.020	0.031
A1	0.500	0.700	0.020	0.028
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	0.750	0.850	0.030	0.033
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.200 REF		0.008 REF	
L	0.010	0.070	0.001	0.003
θ	7° REF		7° REF	



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