

### Surface Mount Zener Diodes

 Lead(Pb)-Free

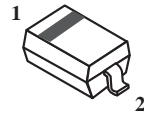
#### Features:

- \*500mw Power Dissipation
- \*Ideal for Surface Mounted Application
- \*Zener Breakdown Voltage Range 2.4V to 110V

#### Mechanical Data:

- \*Case : SOD-123 Molded plastic
- \*Terminals: Solderable per MIL-STD-202, Method 208
- \*Polarity: Cathode Indicated by Polarity Band
- \*Marking: Marking Code (See Table on Page 3)
- \*Weigh: 0.01grams(approx)

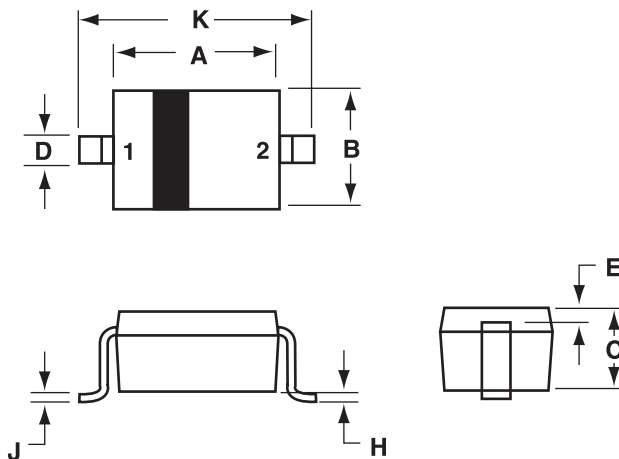
**SMALL SIGNAL  
ZENER DIODES  
500m WATTS**



**SOD-123**

### SOD-123 Outline Dimensions

Unit:mm



SOD-123		
Dim	Min	Max
A	2.55	2.85
B	1.40	1.80
C	0.95	1.35
D	0.50	0.70
E	0.30 REF	
H	-	0.10
J	-	0.15
K	3.55	3.85

PIN 1. CATHODE  
2. ANODE

## Maximum Ratings and Electrical Characteristics (TA=25 °C Unless Otherwise Noted)

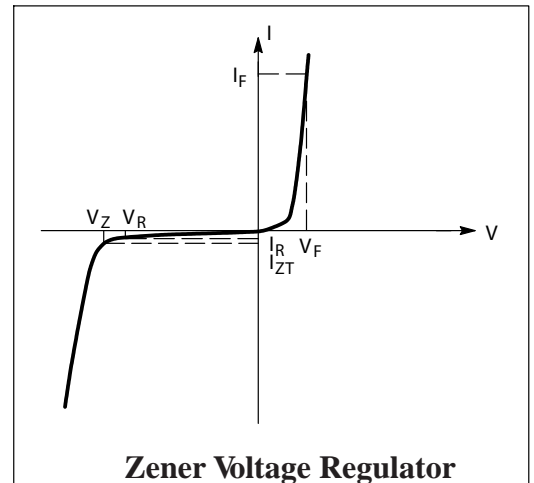
Characteristics	Symbol	Value	Unit
Total Power Dissipation on FR-5 Board <sup>(1)</sup> @T <sub>L</sub> =75 °C	PD	500	mW
Thermal Resistance Junction to Ambient Air <sup>(2)</sup>	R <sub>θJA</sub>	340	°C/W
Forward Voltage @ I <sub>F</sub> =10mA	V <sub>F</sub>	0.9	V
Junction and Storage Temperature Range	T <sub>J</sub> ,T <sub>STG</sub>	-65 to+150	°C

NOTES:1. FR-5=3.5×1.5inches, using the on minimum recommedned footprint.  
2. Thermal Resistance measurement obtained via infrared scan method.

## 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)

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>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>
I <sub>zk</sub>	Reverse Current
Z <sub>zk</sub>	Maximun Zener Impedance @ I <sub>zk</sub>



## Device Marking

Item	Marking	Equivalent Circuit Diagram
MMSZ5221B Series	XX=Specific Device Code (See Table on page3)	

ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted,  $V_F = 0.9\text{ V Max.}$  @  $I_F = 10\text{ mA}$ )

Device	Device Marking	Zener Voltage (Notes 3 and 4)				Zener Impedance (Note 5)			Leakage Current	
		$V_Z$ (Volts)			@ $I_{ZT}$	$Z_{ZT}$ @ $I_{ZT}$	$Z_{ZK}$ @ $I_{ZK}$		$I_R$ @ $V_R$	
		Min	Nom	Max	mA	$\Omega$	$\Omega$	mA	$\mu\text{A}$	Volts
MMSZ5221B	C1	2.28	2.4	2.52	20	30	1200	0.25	100	1
MMSZ5222B	C2	2.38	2.5	2.63	20	30	1250	0.25	100	1
MMSZ5223B	C3	2.57	2.7	2.84	20	30	1300	0.25	75	1
MMSZ5224B	C4	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMSZ5225B	C5	2.85	3.0	3.15	20	29	1600	0.25	50	1
MMSZ5226B	D1	3.14	3.3	3.47	20	28	1600	0.25	25	1
MMSZ5227B	D2	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMSZ5228B	D3	3.71	3.9	4.10	20	23	1900	0.25	10	1
MMSZ5229B	D4	4.09	4.3	4.52	20	22	2000	0.25	5	1
MMSZ5230B	D5	4.47	4.7	4.94	20	19	1900	0.25	5	2
MMSZ5231B	E1	4.85	5.1	5.36	20	17	1600	0.25	5	2
MMSZ5232B	E2	5.32	5.6	5.88	20	11	1600	0.25	5	3
MMSZ5233B	E3	5.70	6.0	6.30	20	7	1600	0.25	5	3.5
MMSZ5234B	E4	5.89	6.2	6.51	20	7	1000	0.25	5	4
MMSZ5235B	E5	6.46	6.8	7.14	20	5	750	0.25	3	5
MMSZ5236B	F1	7.13	7.5	7.88	20	6	500	0.25	3	6
MMSZ5237B	F2	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMSZ5238B	F3	8.27	8.7	9.14	20	8	600	0.25	3	6.5
MMSZ5239B	F4	8.65	9.1	9.56	20	10	600	0.25	3	7
MMSZ5240B	F5	9.50	10	10.50	20	17	600	0.25	3	8
MMSZ5241B	H1	10.45	11	11.55	20	22	600	0.25	2	8.4
MMSZ5242B	H2	11.40	12	12.60	20	30	600	0.25	1	9.1
MMSZ5243B	H3	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMSZ5244B	H4	13.30	14	14.70	9.0	15	600	0.25	0.1	10
MMSZ5245B	H5	14.25	15	15.75	8.5	16	600	0.25	0.1	11
MMSZ5246B	J1	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MMSZ5247B	J2	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMSZ5248B	J3	17.10	18	18.90	7.0	21	600	0.25	0.1	14
MMSZ5250B	J5	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MMSZ5251B	K1	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMSZ5252B	K2	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MMSZ5253B	K3	23.75	25	26.25	5.0	35	600	0.25	0.1	19
MMSZ5254B	K4	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MMSZ5255B	K5	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMSZ5256B	M1	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMSZ5257B	M2	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MMSZ5258B	M3	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMSZ5259B	M4	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMSZ5260B	M5	40.85	43	45.15	3.0	93	900	0.25	0.1	33
MMSZ5261B	N1	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MMSZ5262B	N2	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMSZ5263B	N3	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MMSZ5264B	N4	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MMSZ5265B	N5	58.90	62	65.10	2.0	185	1400	0.25	0.1	47
MMSZ5266B	P1	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MMSZ5267B	P2	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MMSZ5268B	P3	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MMSZ5269B	P4	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MMSZ5270B	P5	86.45	91	95.55	1.4	400	2300	0.25	0.1	69
MMSZ5272B	R2	104.5	110	115.5	1.1	750	3000	0.25	0.1	84

- NOTE: 3. The type numbers shown have a standard tolerance of  $\pm 5\%$  on the nominal Zener voltage.  
 4. Nominal Zener voltage is measured with the device junction in thermal equilibrium at  $T_L = 30\text{ }^\circ\text{C} \pm 1\text{ }^\circ\text{C}$   
 5.  $Z_{ZT}$  and  $Z_{ZK}$  are measured by dividing the AC voltage drop across the device by the ac current applied.  
 The specified limits are for  $I_{Z(AC)} = 0.1 I_{Z(dc)}$  with the AC frequency = 1 KHz.

TYPICAL CHARACTERISTICS

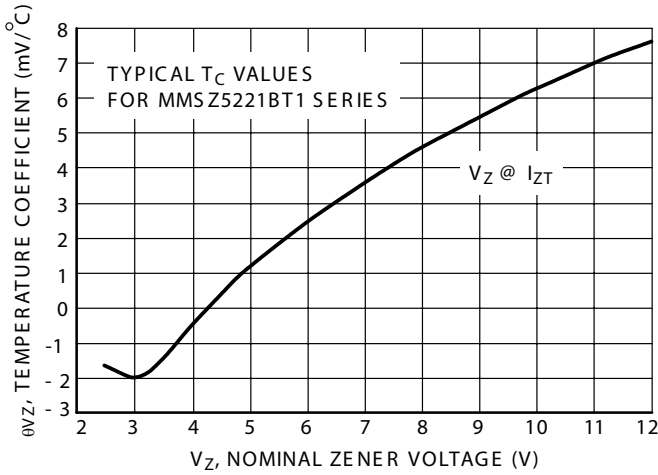


Figure 1. Temperature Coefficients (Temperature Range -55°C to +150°C)

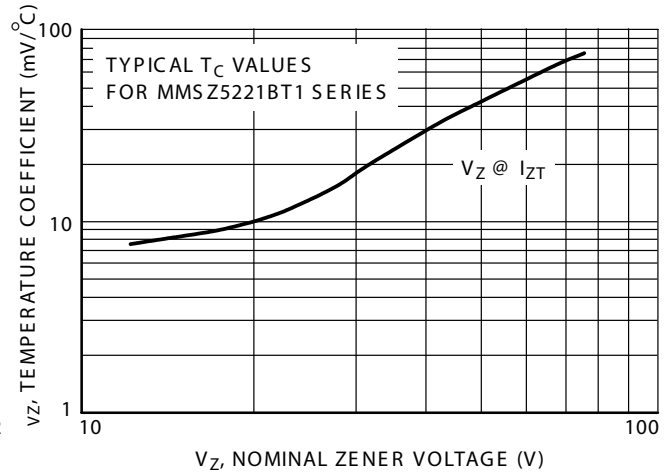


Figure 2. Temperature Coefficients (Temperature Range -55°C to +150°C)

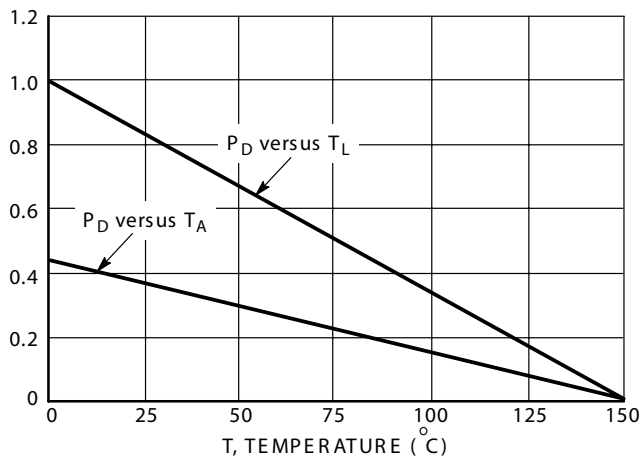


Figure 3. Steady State Power Derating

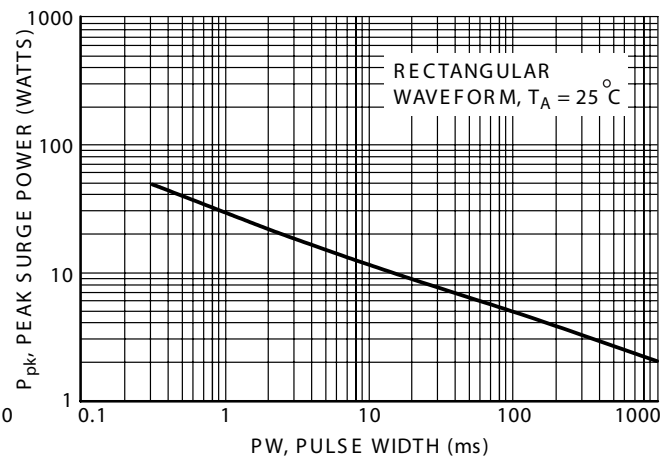


Figure 4. Maximum Nonrepetitive Surge Power

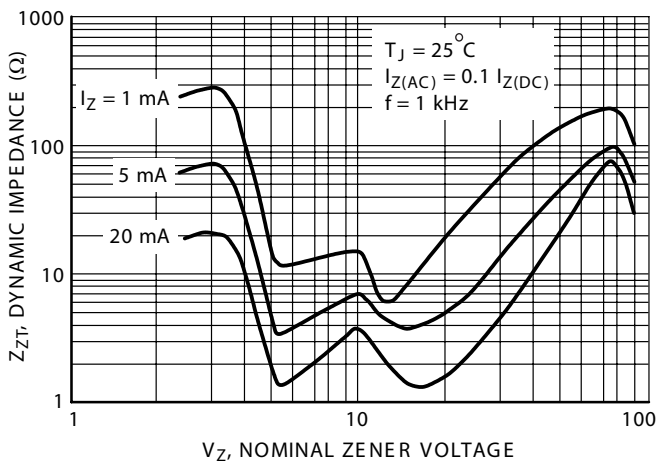


Figure 5. Effect of Zener Voltage on Zener Impedance

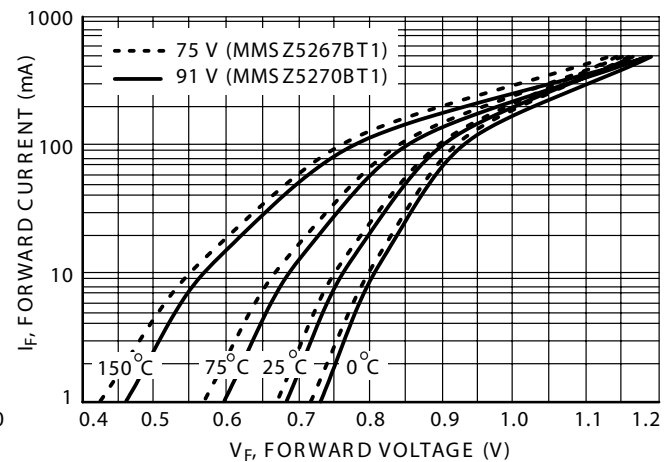


Figure 6. Typical Forward Voltage

TYPICAL CHARACTERISTICS

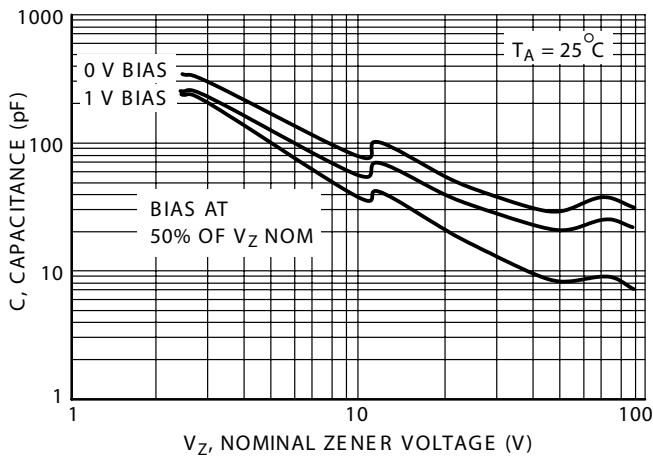


Figure 7. Typical Capacitance

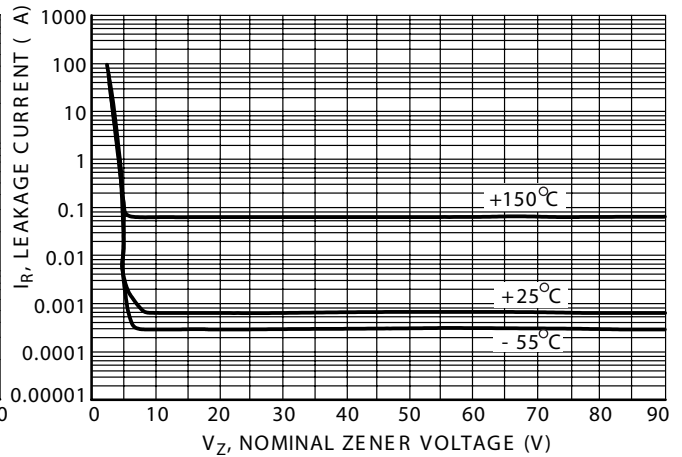


Figure 8. Typical Leakage Current

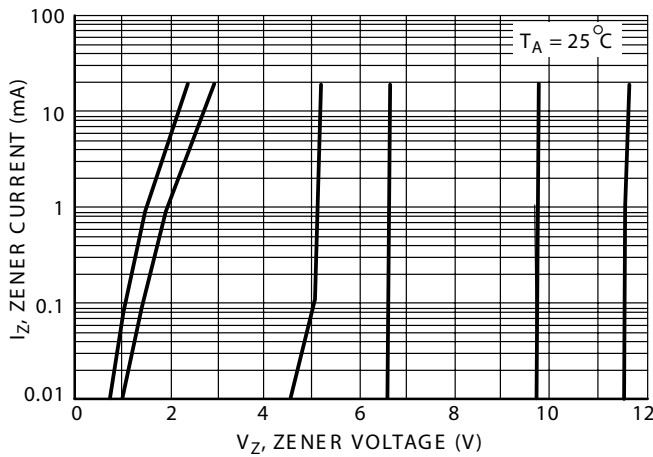


Figure 9. Zener Voltage versus Zener Current ( $V_Z$  Up to 12 V)

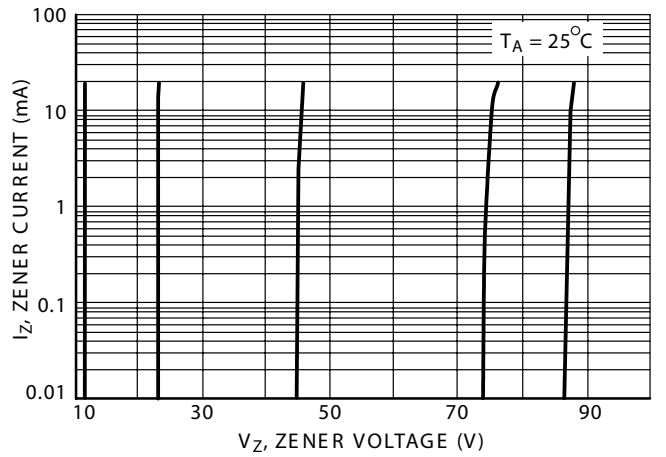


Figure 10. Zener Voltage versus Zener Current (12 V to 91 V)