

## Surface Mount Zener Diodes

**(Pb)** Lead(Pb)-Free

**Features:**

- \*225mw Power Dissipation
- \*Ideal for Surface Mountted Application
- \*Zener Breakdown Voltage Range 2.4V to 91V

**SMALL SIGNAL  
ZENER DIODES  
225m WATTS**

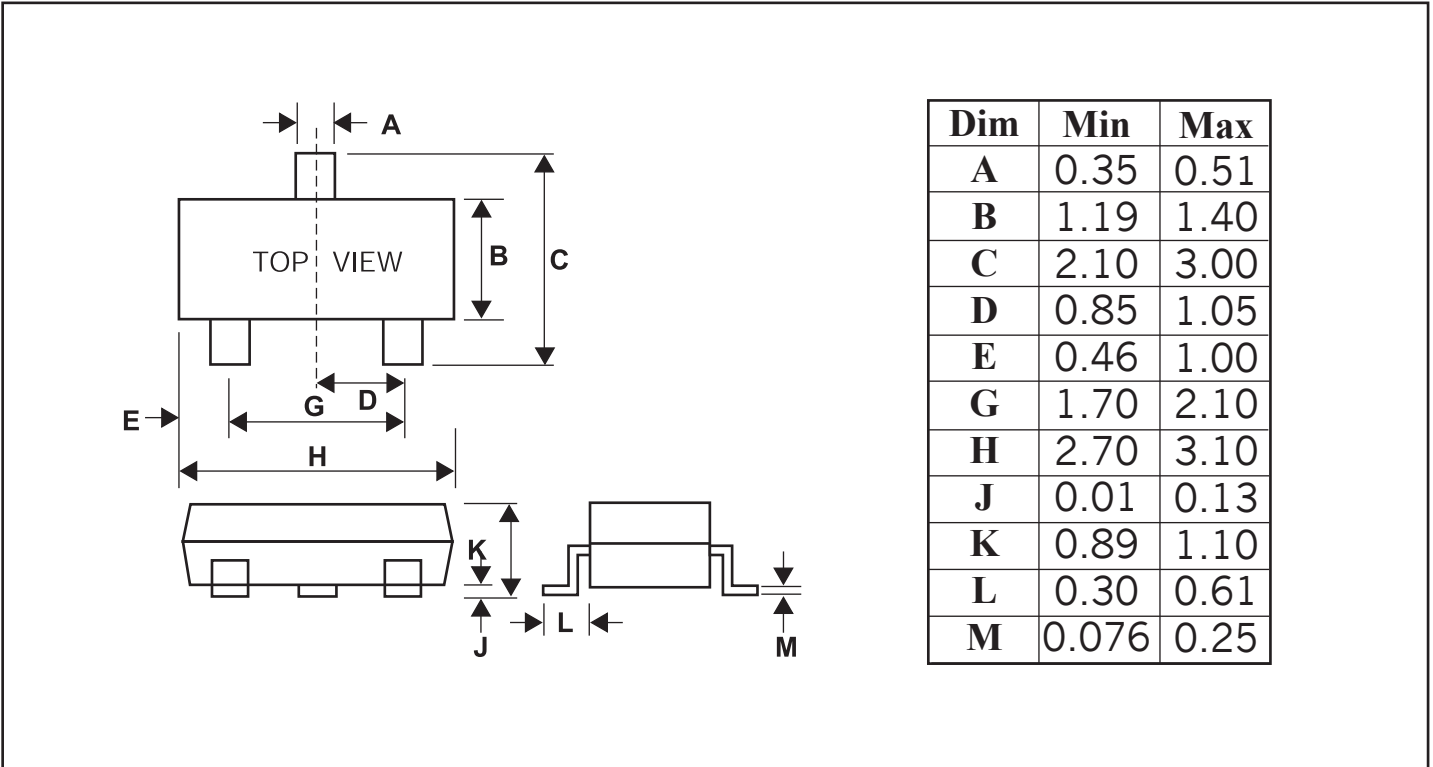


**Mechanical Data:**

- \*Case : SOT-23 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: 0.008grams(approx)

## SOT-23 Outline Dimensions

Unit:mm



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

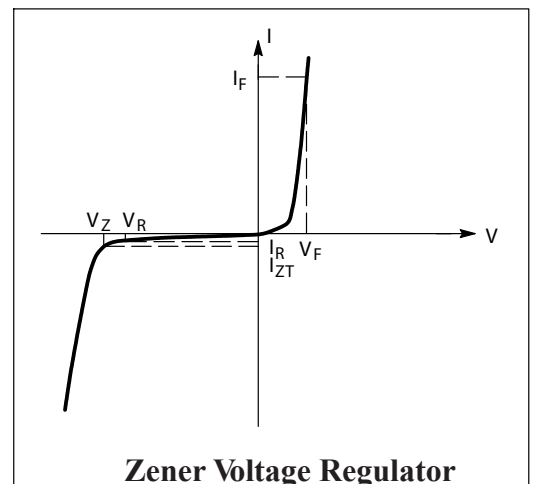
Characteristics	Symbol	Value	Unit
Total Power Dissipation on FR-5 Board <sup>(1)</sup> @TA=25°C	PD	225	mW
Thermal Resistance Junction to Ambient Air <sup>(1)</sup>	RθJA	556	°C/W
Forward Voltage @ IF=10mA	VF	0.9	V
Junction and Storage Temperature Range	Tj, TSTG	-65 to +150	°C

NOTES: 1. FR-5=1.0\*0.75\*0.62in

## ELECTRICAL CHARACTERISTICS

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) (TA = 25°C unless otherwise noted, VF = 0.9V Max. @ IF = 10 mA)

Symbol	Parameter
VZ	Reverse Zener Voltage @ IZT
IZT	Reverse Current
ZZT	Maximum Zener Impedance @ IZT
IR	Reverse Leakage Current @ VR
VR	Reverse Voltage
IF	Forward Current
VF	Forward Voltage @ IF
IZK	Reverse Current
ZZK	Maximum Zener Impedance @ IZK



## Device Marking

Item	Marking	Equivalent Circuit Diagram
MMBZ5221B Series	XX=Specific Device Code (See Table on page3)	

## ELECTRICAL CHARACTERISTICS

(Pinout: 1-Anode, 2-NC, 3-Cathode) ( $V_F = 0.9\text{ V Max @ } I_F = 10\text{ mA}$  for all types.)

Device	Device Marking	Zener Voltage(Note)				Zener Impedance			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
MMBZ5221B	18A	2.28	2.4	2.52	20	30	1200	0.25	100	1
MMBZ5222B	18B	2.37	2.5	2.63	20	30	1250	0.25	100	1
MMBZ5223B	18C	2.56	2.7	2.84	20	30	1300	0.25	75	1
MMBZ5224B	18D	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMBZ5225B	18E	2.85	3	3.15	20	29	1600	0.25	50	1
MMBZ5226B	8A	3.13	3.3	3.47	20	28	1600	0.25	25	1
MMBZ5227B	8B	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMBZ5228B	8C	3.70	3.9	4.10	20	23	1900	0.25	10	1
MMBZ5229B	8D	4.08	4.3	4.52	20	22	2000	0.25	5	1
MMBZ5230B	8E	4.46	4.7	4.94	20	19	1900	0.25	5	2
MMBZ5231B	8F	4.84	5.1	5.36	20	17	1600	0.25	5	2
MMBZ5232B	8G	5.32	5.6	5.88	20	11	1600	0.25	5	3
MMBZ5233B	8H	5.70	6	6.30	20	7	1600	0.25	5	3.5
MMBZ5234B	8J	5.89	6.2	6.51	20	7	1000	0.25	5	4
MMBZ5235B	8K	6.46	6.8	7.14	20	5	750	0.25	3	5
MMBZ5236B	8L	7.12	7.5	7.88	20	6	500	0.25	3	6
MMBZ5237B	8M	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMBZ5238B	8N	8.26	8.7	9.14	20	8	600	0.25	3	6.5
MMBZ5239B	8P	8.64	9.1	9.56	20	10	600	0.25	3	7
MMBZ5240B	8Q	9.50	10	10.50	20	17	600	0.25	3	8
MMBZ5241B	8R	10.4	11	11.55	20	22	600	0.25	2	8.4
MMBZ5242B	8S	11.40	12	12.60	20	30	600	0.25	1	9.1
MMBZ5243B	8T	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMBZ5244B	8U	13.30	14	14.70	9	15	600	0.25	0.1	10
MMBZ5245B	8V	14.25	15	15.75	8.5	16	600	0.25	0.1	11
MMBZ5246B	8W	15.20	16	16.80	7.8	17	600	0.25	0.1	12
MMBZ5247B	8X	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMBZ5248B	8Y	17.10	18	18.90	7	21	600	0.25	0.1	14
MMBZ5249B	8Z	18.05	19	19.95	6.6	23	600	0.25	0.1	14
MMBZ5250B	81A	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MMBZ5251B	81B	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMBZ5252B	81C	22.80	24	25.20	5.2	33	600	0.25	0.1	18
MMBZ5253B	81D	23.75	25	26.25	5	35	600	0.25	0.1	19
MMBZ5254B	81E	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MMBZ5255B	81F	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMBZ5256B	81G	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMBZ5257B	81H	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MMBZ5258B	81J	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMBZ5259B	81K	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMBZ5260B	81L	40.85	43	45.15	3	93	900	0.25	0.1	33
MMBZ5261B	81M	44.65	47	49.35	2.7	105	1000	0.25	0.1	36
MMBZ5262B	81N	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMBZ5263B	81P	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MMBZ5264B	81Q	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MMBZ5265B	81R	58.90	62	65.10	2	185	1400	0.25	0.1	47
MMBZ5266B	81S	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MMBZ5267B	81T	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MMBZ5268B	81U	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MMBZ5269B	81V	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MMBZ5270B	81W	86.45	91	95.55	1.4	400	2300	0.25	0.1	69

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

TYPICAL CHARACTERISTICS

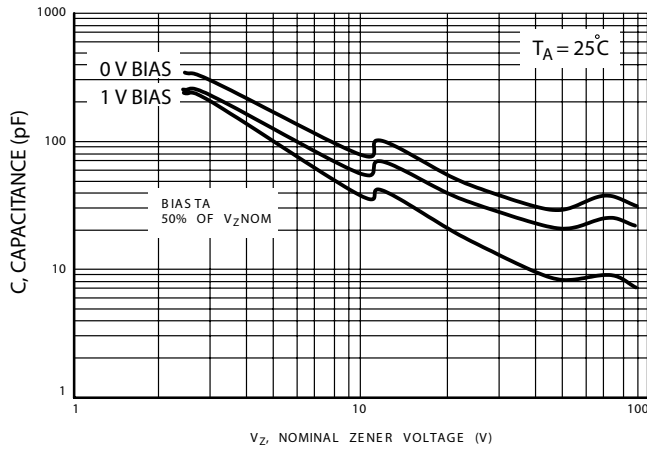


Figure 5. Typical Capacitance

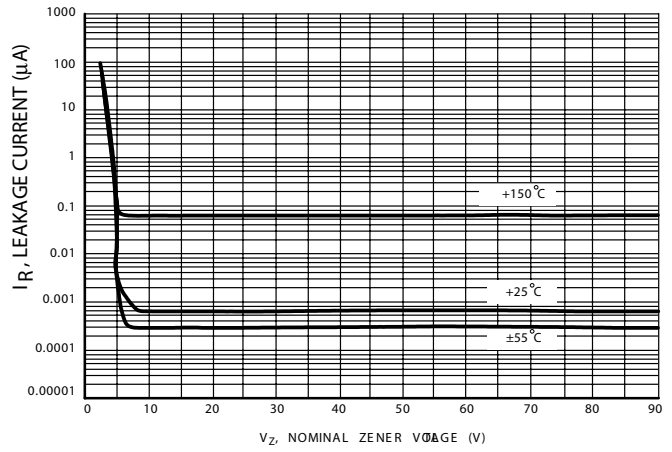


Figure 6. Typical Leakage Current

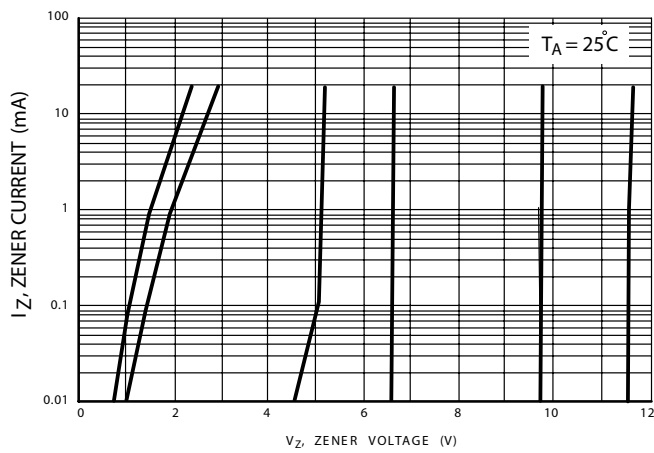


Figure 7. Zener Voltage versus Zener Current (V<sub>Z</sub> Up to 12 V)

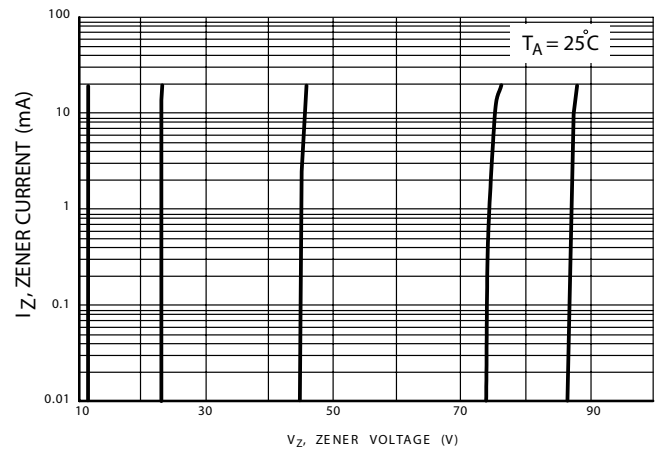


Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)

TYPICAL CHARACTERISTICS

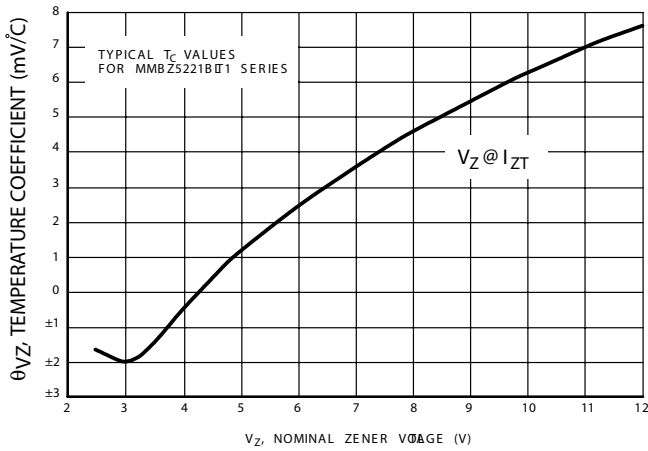


Figure 1. Temperature Coefficients (Temperature Range  $\pm 55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ )

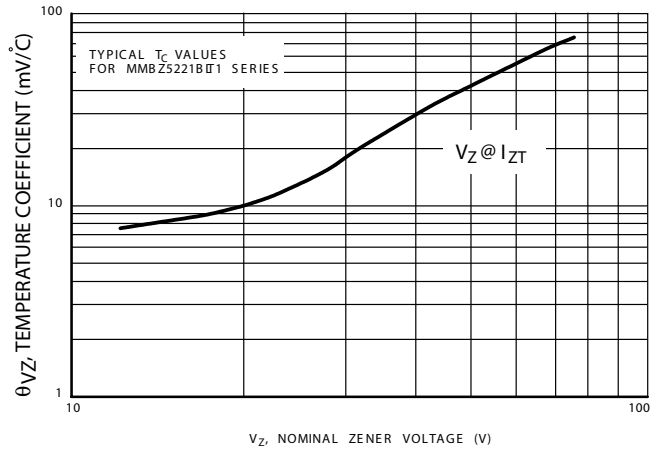


Figure 2. Temperature Coefficients (Temperature Range  $\pm 55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ )

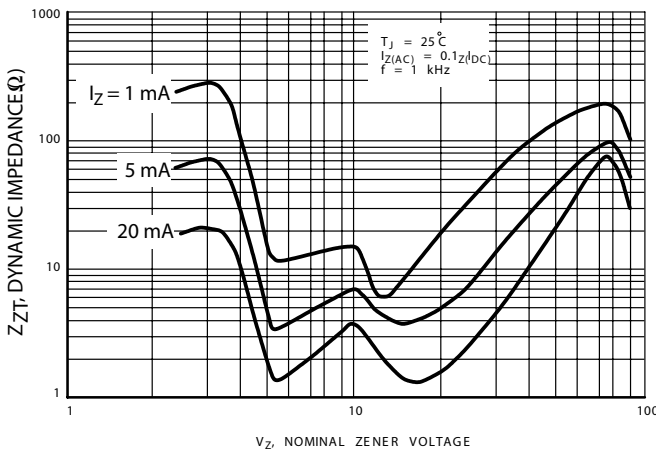


Figure 3. Effect of Zener Voltage on Zener Impedance

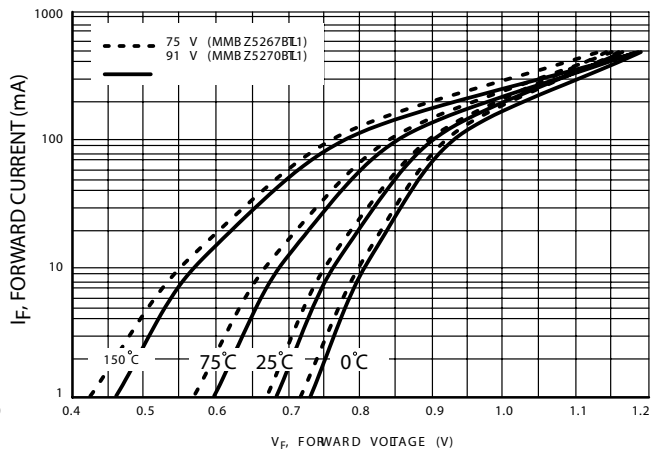


Figure 4. Typical Forward Voltage