

## Zener Voltage Regulator Diodes

### TECHNICAL DATA

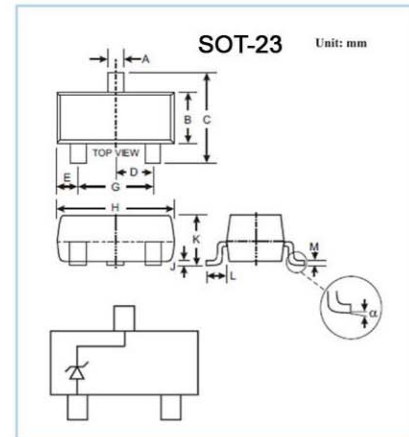
#### GENERAL DATA APPLICABLE TO ALL SERIES IN THIS GROUP

## Zener Voltage Regulator Diodes

#### MAXIMUM CASE TEMPERATURE FOR SOLDERING

**PURPOSES:** 260°C for 10 seconds

#### THERMAL CHARACTERISTICS



Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board* $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225	mW
Thermal Resistance Junction to Ambient	$R_{QJA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate,** $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300	mW
Thermal Resistance Junction to Ambient	$R_{QJA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	$T_J, T_{stg}$	150	$^\circ\text{C}$

\*\*FR-5 = 1.0 x 0.75 x 0.62 in.

\*\*Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

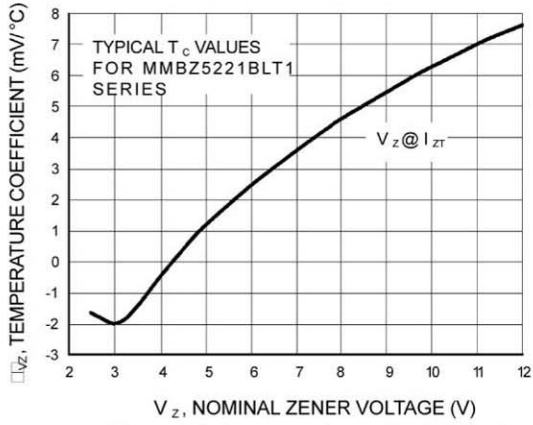
## ELECTRICAL CHARACTERISTICS

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

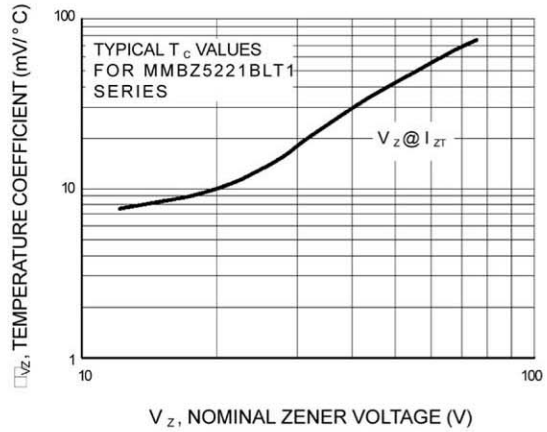
Type Number	Marking	Zener Voltage $V_{z1}$ (Volts) @ $I_{ZT1}=5mA$ (Note 1)			Max Zener Impedance $Z_{ZT1}$ (Ohms) @ $I_{ZT1}=5mA$	Max Reverse Leakage Current		Zener Voltage $V_{z2}$ (Volts) @ $I_{ZT2}=1mA$ (Note1)		Max Zener Impedance $Z_{ZT2}$ (Ohms) @ $I_{ZT2}=1mA$	Zener Voltage $V_{z3}$ (Volts) @ $I_{ZT3}=20mA$ (Note 1)		Max Zener Impedance $Z_{ZT3}$ (Ohms) @ $I_{ZT3}=20mA$	$d_{vz}/dt$ (mv/k) @ $I_{ZT1}=5mA$		CpF Max @ $VR=0$ $f=1MHz$
		Nom	Min	Max		$I_R$ μA	$V_R$ Volts	Min	Max		Min	Max		Min	Max	
BZX84C2V4	Z11	2.4	2.2	2.6	100	50	1	1.7	2.1	600	2.6	3.2	50	-3.5	0	450
BZX84C2V7	Z12	2.7	2.5	2.9	100	20	1	1.9	2.4	600	3	3.6	50	-3.5	0	450
BZX84C3V0	Z13	3	2.8	3.2	95	10	1	2.1	2.7	600	3.3	3.9	50	-3.5	0	450
BZX84C3V3	Z14	3.3	3.1	3.5	95	5	1	2.3	2.9	600	3.6	4.2	40	-3.5	0	450
BZX84C3V6	Z15	3.6	3.4	3.8	90	5	1	2.7	3.3	600	3.9	4.5	40	-3.5	0	450
BZX84C3V9	Z16	3.9	3.7	4.1	90	3	1	2.9	3.5	600	4.1	4.7	30	-3.5	-2.5	450
BZX84C4V3	W9	4.3	4	4.6	90	3	1	3.3	4	600	4.4	5.1	30	-3.5	0	450
BZX84C4V7	Z1	4.7	4.4	5	80	3	2	3.7	4.7	500	4.5	5.4	15	-3.5	0.2	260
BZX84C5V1	Z2	5.1	4.8	5.4	60	2	2	4.2	5.3	480	5	5.9	15	-2.7	1.2	225
BZX84C5V6	Z3	5.6	5.2	6	40	1	2	4.8	6	400	5.2	6.3	10	-2.0	2.5	200
BZX84C6V2	Z4	6.2	5.8	6.6	10	3	4	5.6	6.6	150	5.8	6.8	6	0.4	3.7	185
BZX84C6V8	Z5	6.8	6.4	7.2	15	2	4	6.3	7.2	80	6.4	7.4	6	1.2	4.5	155
BZX84C7V5	Z6	7.5	7	7.9	15	1	5	6.9	7.9	80	7	8	6	2.5	5.3	140
BZX84C8V2	Z7	8.2	7.7	8.7	15	0.7	5	7.6	8.7	80	7.7	8.8	6	3.2	6.2	135
BZX84C9V1	Z8	9.1	8.5	9.6	15	0.5	6	8.4	9.6	100	8.5	9.7	8	3.8	7.0	130
BZX84C10	Z9	10	9.4	10.6	20	0.2	7	9.3	10.6	150	9.4	10.7	10	4.5	8.0	130
BZX84C11	Y1	11	10.4	11.6	20	0.1	8	10.2	11.6	150	10.4	11.8	10	5.4	9.0	130
BZX84C12	Y2	12	11.4	12.7	25	0.1	8	11.2	12.7	150	11.4	12.9	10	6.0	10.0	130
BZX84C13	Y3	13	12.4	14.1	30	0.1	8	12.3	14	170	12.5	14.2	15	7.0	11.0	120
BZX84C15	Y4	15	13.8	15.6	30	0.05	10.5	13.7	15.5	200	13.9	15.7	20	9.2	13.0	110
BZX84C16	Y5	16	15.3	17.1	40	0.05	11.2	15.2	17	200	15.4	17.2	20	10.4	14.0	105
BZX84C18	Y6	18	16.8	19.1	45	0.05	12.6	16.7	19	225	16.9	19.2	20	12.4	16.0	100
BZX84C20	Y7	20	18.8	21.2	55	0.05	14	18.7	21.1	225	18.9	21.4	20	14.4	18.0	85
BZX84C22	Y8	22	20.8	23.3	55	0.05	15.4	20.7	23.2	250	20.9	23.4	25	16.4	20.0	85
BZX84C24	Y9	24	22.8	25.6	70	0.05	16.8	22.7	25.5	250	22.9	25.7	25	18.4	22.0	80
BZX84C27	Y10	27	25.1	28.9	80	0.05	18.9	25	28.9	300	25.2	29.3	45	21.4	25.3	70
BZX84C30	Y11	30	28	32	80	0.05	21	27.8	32	300	28.1	32.4	50	24.4	29.4	70
BZX84C33	Y12	33	31	35	80	0.05	23.1	30.8	35	325	31.1	35.4	55	27.4	33.4	70
BZX84C36	Y13	36	34	38	90	0.05	25.2	33.8	38	350	34.1	38.4	60	30.4	37.4	70
BZX84C39	Y14	39	37	41	130	0.05	27.3	36.7	41	350	37.1	41.5	70	33.4	41.2	45
BZX84C43	Y15	43	40	46	150	0.05	30.1	39.7	46	375	40.1	46.5	80	37.6	46.6	40
BZX84C47	Y16	47	44	50	170	0.05	32.9	43.7	50	375	44.1	50.5	90	42.0	51.8	40
BZX84C51	Y17	51	48	54	180	0.05	35.7	47.6	54	400	48.1	54.6	100	46.6	57.2	40
BZX84C56	Y18	56	52	60	200	0.05	39.2	51.5	60	425	52.1	60.8	110	52.2	63.8	40
BZX84C62	Y19	62	58	66	215	0.05	43.4	57.4	66	450	58.2	67	120	58.8	71.6	35
BZX84C68	Y20	68	64	72	240	0.05	47.6	63.4	72	475	64.2	73.2	130	65.6	79.8	35
BZX84C75	Y21	75	70	79	255	0.05	52.5	69.4	79	500	70.3	80.2	140	73.4	88.6	35

- NOTES:** 1. Zener voltage is measured with a pulse test current ( $I_Z$ ) applied at an ambient temperature of 25°C.  
 2. The zener impedance,  $Z_{ZT2}$ , for the 27 through 75 volt types is tested at 0.5 mA rather than the test current of 0.1 mA used for  $V_{z2}$ .

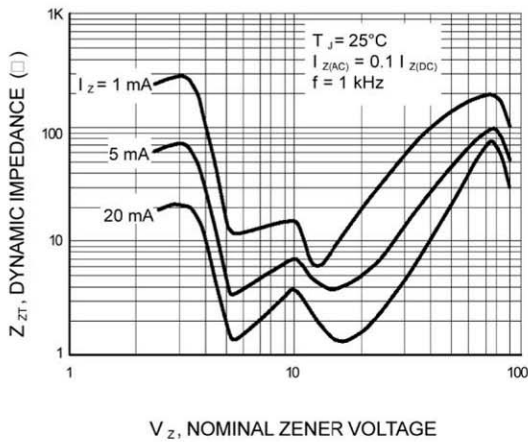
## TYPICAL CHARACTERISTICS



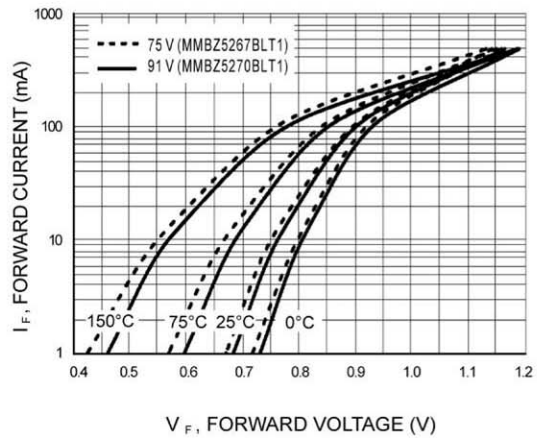
**Figure 1. Temperature Coefficients**  
(Temperature Range  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ )



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

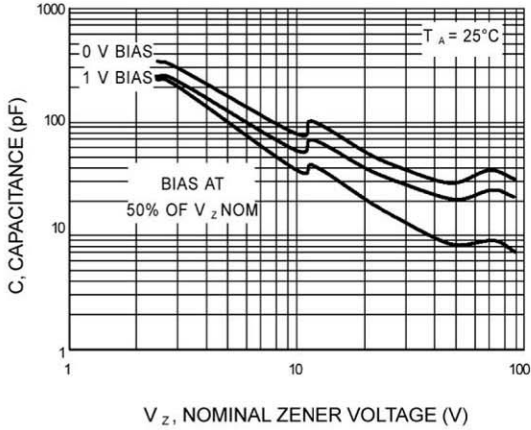


**Figure 3. Effect of Zener Voltage on Zener Impedance**

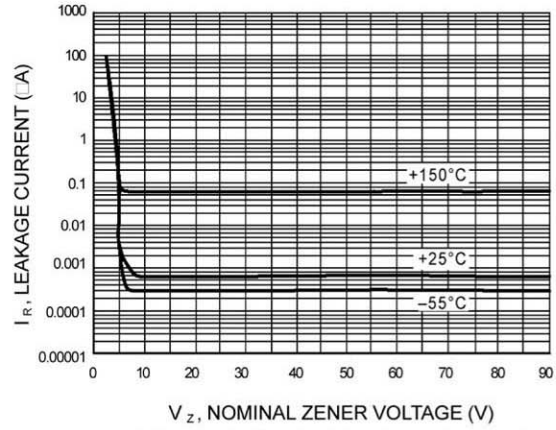


**Figure 4. Typical Forward Voltage**

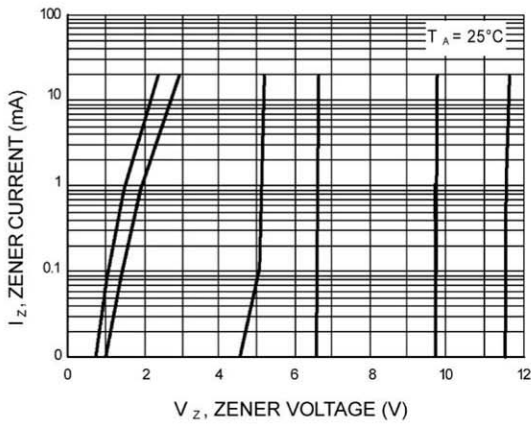
## TYPICAL CHARACTERISTICS



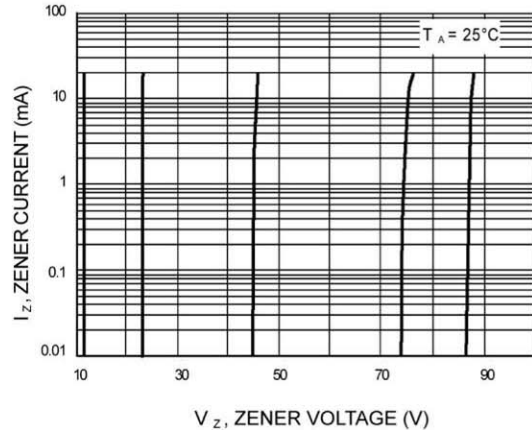
**Figure 5. Typical Capacitance**



**Figure 6. Typical Leakage Current**



**Figure 7. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)**



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