

Zener Voltage Regulator Diodes

TECHNICAL DATA

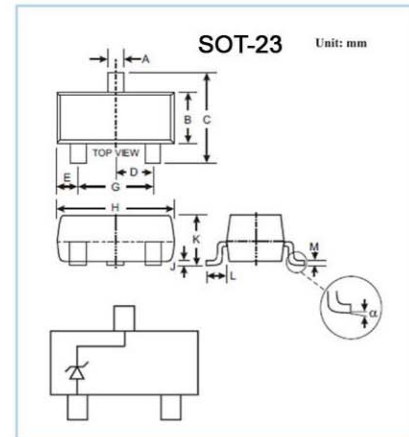
GENERAL DATA APPLICABLE TO ALL SERIES IN THIS GROUP

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°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°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

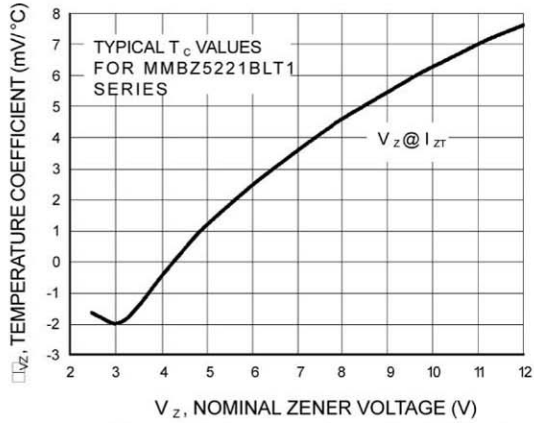


Figure 1. Temperature Coefficients
(Temperature Range -55°C to $+150^{\circ}\text{C}$)

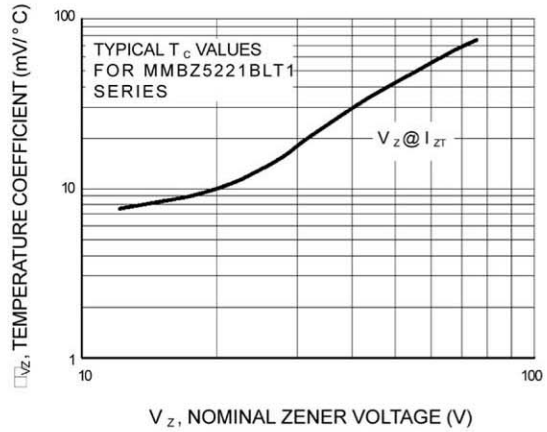


Figure 2. Temperature Coefficients
(Temperature Range -55°C to $+150^{\circ}\text{C}$)

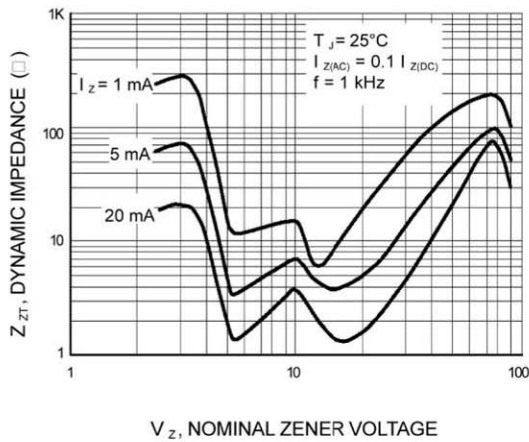


Figure 3. Effect of Zener Voltage on Zener Impedance

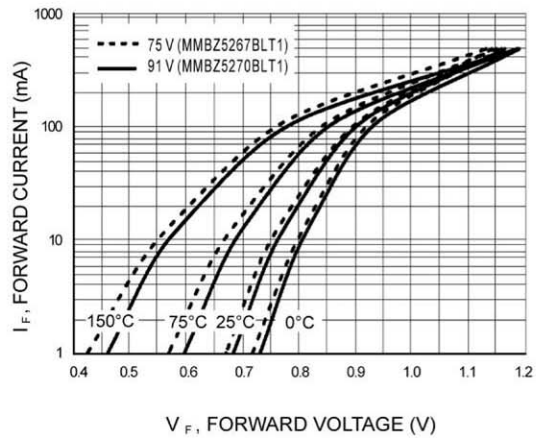


Figure 4. Typical Forward Voltage

TYPICAL CHARACTERISTICS

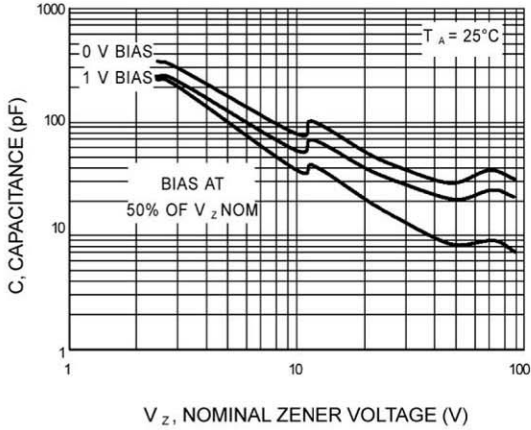


Figure 5. Typical Capacitance

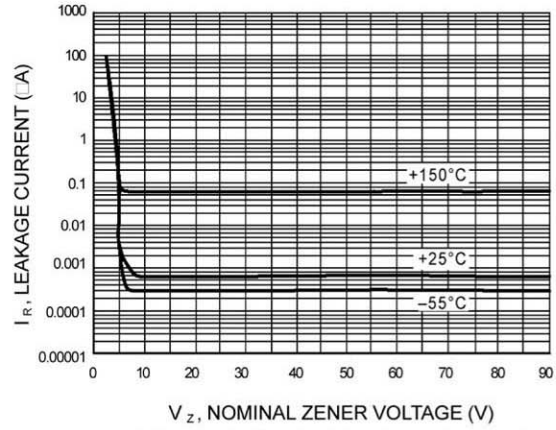
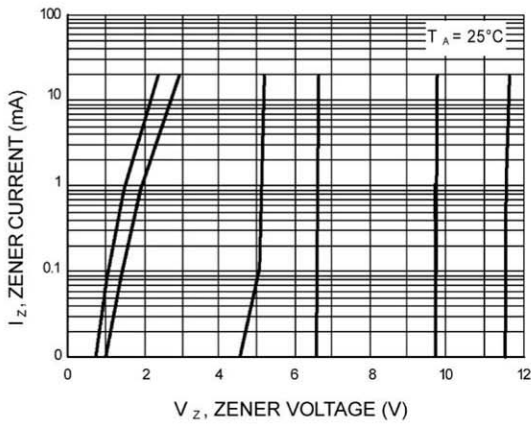
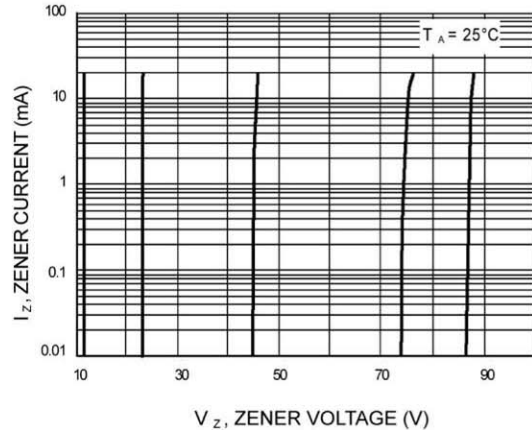


Figure 6. Typical Leakage Current



**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)**

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