

Zener Voltage Regulators

225 mW SOT-23 Surface Mount

MMBZ52xxBLT1G Series, SZMMBZ52xxBLT1G Series

This series of Zener diodes is offered in the convenient, surface mount plastic SOT-23 package. These devices are designed to provide voltage regulation with minimum space requirement. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

Features

- 225 mW Rating on FR-4 or FR-5 Board
- Zener Voltage Range – 2.4 V to 91 V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- ESD Rating of Class 3 (> 16 KV) per Human Body Model
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Mechanical Characteristics

CASE: Void-free, transfer-molded, thermosetting plastic case

FINISH: Corrosion resistant finish, easily solderable

MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

POLARITY: Cathode indicated by polarity band

FLAMMABILITY RATING: UL 94 V-0

MAXIMUM RATINGS

| Rating | Symbol | Max | Units |
|--------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|----------------------------|
| Total Power Dissipation on FR-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ Derated above 25°C | P_D | 225 1.8 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 556 | $^\circ\text{C}/\text{W}$ |
| Total Power Dissipation on Alumina Substrate, (Note 2) @ $T_A = 25^\circ\text{C}$ Derated above 25°C | P_D | 300 2.4 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 417 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -65 to +150 | $^\circ\text{C}$ |

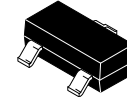
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-5 = 1.0 X 0.75 X 0.62 in.
2. Alumina = 0.4 X 0.3 X 0.024 in, 99.5% alumina.

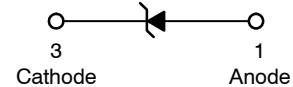


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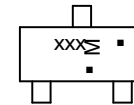
www.onsemi.com



SOT-23
CASE 318
STYLE 8



MARKING DIAGRAM



- xxx = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------------|---------------------|-------------------------|
| MMBZ52xxBLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| SZMMBZ52xxBLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| MMBZ52xxBLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |
| SZMMBZ52xxBLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

DEVICE MARKING INFORMATION

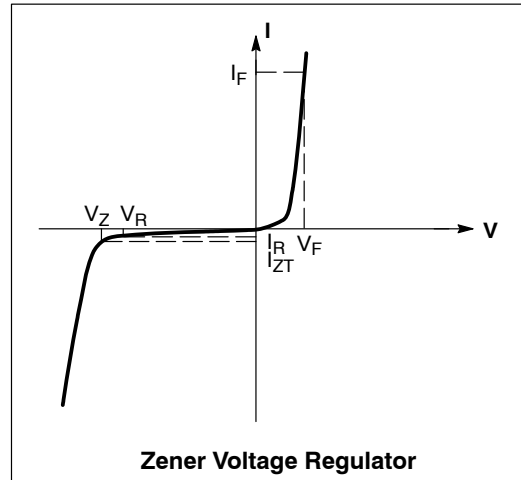
See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

MMBZ52xxBLT1G Series, SZMMBZ52xxBLT1G Series

ELECTRICAL CHARACTERISTICS

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.95\text{ V Max. @ } I_F = 10\text{ mA}$)

| Symbol | Parameter |
|----------|------------------------------------|
| V_Z | Reverse Zener Voltage @ I_{ZT} |
| I_{ZT} | Reverse Current |
| Z_{ZT} | Maximum Zener Impedance @ I_{ZT} |
| I_{ZK} | Reverse Current |
| Z_{ZK} | Maximum Zener Impedance @ I_{ZK} |
| I_R | Reverse Leakage Current @ V_R |
| V_R | Reverse Voltage |
| I_F | Forward Current |
| V_F | Forward Voltage @ I_F |



MMBZ52xxBLT1G Series, SZMMBZ52xxBLT1G Series

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 3) | | | 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 | Ω | Ω | mA | μA | Volts |
| MMBZ5221BLT1G | 18A | 2.28 | 2.4 | 2.52 | 20 | 30 | 1200 | 0.25 | 100 | 1 |
| MMBZ5222BLT1G | 18B | 2.37 | 2.5 | 2.63 | 20 | 30 | 1250 | 0.25 | 100 | 1 |
| MMBZ5223BLT1G | 18C | 2.56 | 2.7 | 2.84 | 20 | 30 | 1300 | 0.25 | 75 | 1 |
| MMBZ5224BLT1G | 18D | 2.66 | 2.8 | 2.94 | 20 | 30 | 1400 | 0.25 | 75 | 1 |
| MMBZ5225BLT1G | 18E | 2.85 | 3 | 3.15 | 20 | 29 | 1600 | 0.25 | 50 | 1 |
| MMBZ5226BLT1G | 8A | 3.13 | 3.3 | 3.47 | 20 | 28 | 1600 | 0.25 | 25 | 1 |
| MMBZ5227BLT1G | 8B | 3.42 | 3.6 | 3.78 | 20 | 24 | 1700 | 0.25 | 15 | 1 |
| MMBZ5228BLT1G | 8C | 3.70 | 3.9 | 4.10 | 20 | 23 | 1900 | 0.25 | 10 | 1 |
| MMBZ5229BLT1G | 8D | 4.08 | 4.3 | 4.52 | 20 | 22 | 2000 | 0.25 | 5 | 1 |
| MMBZ5230BLT1G | 8E | 4.46 | 4.7 | 4.94 | 20 | 19 | 1900 | 0.25 | 5 | 2 |
| MMBZ5231BLT1G/T3G | 8F | 4.84 | 5.1 | 5.36 | 20 | 17 | 1600 | 0.25 | 5 | 2 |
| MMBZ5232BLT1G/T3G | 8G | 5.32 | 5.6 | 5.88 | 20 | 11 | 1600 | 0.25 | 5 | 3 |
| MMBZ5233BLT1G | 8H | 5.70 | 6 | 6.30 | 20 | 7 | 1600 | 0.25 | 5 | 3.5 |
| MMBZ5234BLT1G/T3G | 8J | 5.89 | 6.2 | 6.51 | 20 | 7 | 1000 | 0.25 | 5 | 4 |
| MMBZ5235BLT1G | 8K | 6.46 | 6.8 | 7.14 | 20 | 5 | 750 | 0.25 | 3 | 5 |
| MMBZ5236BLT1G | 8L | 7.12 | 7.5 | 7.88 | 20 | 6 | 500 | 0.25 | 3 | 6 |
| MMBZ5237BLT1G | 8M | 7.79 | 8.2 | 8.61 | 20 | 8 | 500 | 0.25 | 3 | 6.5 |
| MMBZ5238BLT1G | 8N | 8.26 | 8.7 | 9.14 | 20 | 8 | 600 | 0.25 | 3 | 6.5 |
| MMBZ5239BLT1G | 8P | 8.64 | 9.1 | 9.56 | 20 | 10 | 600 | 0.25 | 3 | 7 |
| MMBZ5240BLT1G | 8Q | 9.50 | 10 | 10.50 | 20 | 17 | 600 | 0.25 | 3 | 8 |
| MMBZ5241BLT1G/T3G | 8R | 10.4 | 11 | 11.55 | 20 | 22 | 600 | 0.25 | 2 | 8.4 |
| MMBZ5242BLT1G/T3G | 8S | 11.40 | 12 | 12.60 | 20 | 30 | 600 | 0.25 | 1 | 9.1 |
| MMBZ5243BLT1G | 8T | 12.35 | 13 | 13.65 | 9.5 | 13 | 600 | 0.25 | 0.5 | 9.9 |
| MMBZ5244BLT1G | 8U | 13.30 | 14 | 14.70 | 9 | 15 | 600 | 0.25 | 0.1 | 10 |
| MMBZ5245BLT1G | 8V | 14.25 | 15 | 15.75 | 8.5 | 16 | 600 | 0.25 | 0.1 | 11 |
| MMBZ5246BLT1G | 8W | 15.20 | 16 | 16.80 | 7.8 | 17 | 600 | 0.25 | 0.1 | 12 |
| MMBZ5247BLT1G/T3G | 8X | 16.15 | 17 | 17.85 | 7.4 | 19 | 600 | 0.25 | 0.1 | 13 |
| MMBZ5248BLT1G/T3G | 8Y | 17.10 | 18 | 18.90 | 7 | 21 | 600 | 0.25 | 0.1 | 14 |
| MMBZ5249BLT1G | 8Z | 18.05 | 19 | 19.95 | 6.6 | 23 | 600 | 0.25 | 0.1 | 14 |
| MMBZ5250BLT1G/T3G | 81A | 19.00 | 20 | 21.00 | 6.2 | 25 | 600 | 0.25 | 0.1 | 15 |
| MMBZ5251BLT1G | 81B | 20.90 | 22 | 23.10 | 5.6 | 29 | 600 | 0.25 | 0.1 | 17 |
| MMBZ5252BLT1G | 81C | 22.80 | 24 | 25.20 | 5.2 | 33 | 600 | 0.25 | 0.1 | 18 |
| MMBZ5253BLT1G | 81D | 23.75 | 25 | 26.25 | 5 | 35 | 600 | 0.25 | 0.1 | 19 |
| MMBZ5254BLT1G | 81E | 25.65 | 27 | 28.35 | 4.6 | 41 | 600 | 0.25 | 0.1 | 21 |
| MMBZ5255BLT1G | 81F | 26.60 | 28 | 29.40 | 4.5 | 44 | 600 | 0.25 | 0.1 | 21 |
| MMBZ5256BLT1G | 81G | 28.50 | 30 | 31.50 | 4.2 | 49 | 600 | 0.25 | 0.1 | 23 |
| MMBZ5257BLT1G/T3G | 81H | 31.35 | 33 | 34.65 | 3.8 | 58 | 700 | 0.25 | 0.1 | 25 |
| MMBZ5258BLT1G | 81J | 34.20 | 36 | 37.80 | 3.4 | 70 | 700 | 0.25 | 0.1 | 27 |
| MMBZ5259BLT1G | 81K | 37.05 | 39 | 40.95 | 3.2 | 80 | 800 | 0.25 | 0.1 | 30 |
| MMBZ5260BLT1G | 81L | 40.85 | 43 | 45.15 | 3 | 93 | 900 | 0.25 | 0.1 | 33 |
| MMBZ5261BLT1G/T3G | 81M | 44.65 | 47 | 49.35 | 2.7 | 105 | 1000 | 0.25 | 0.1 | 36 |
| MMBZ5262BLT1G | 81N | 48.45 | 51 | 53.55 | 2.5 | 125 | 1100 | 0.25 | 0.1 | 39 |
| MMBZ5263BLT1G | 81P | 53.20 | 56 | 58.80 | 2.2 | 150 | 1300 | 0.25 | 0.1 | 43 |
| MMBZ5264BLT1G | 81Q | 57.00 | 60 | 63.00 | 2.1 | 170 | 1400 | 0.25 | 0.1 | 46 |
| MMBZ5265BLT1G | 81R | 58.90 | 62 | 65.10 | 2 | 185 | 1400 | 0.25 | 0.1 | 47 |
| MMBZ5266BLT1G | 81S | 64.60 | 68 | 71.40 | 1.8 | 230 | 1600 | 0.25 | 0.1 | 52 |
| MMBZ5267BLT1G | 81T | 71.25 | 75 | 78.75 | 1.7 | 270 | 1700 | 0.25 | 0.1 | 56 |
| MMBZ5268BLT1G | 81U | 77.90 | 82 | 86.10 | 1.5 | 330 | 2000 | 0.25 | 0.1 | 62 |
| MMBZ5270BLT1G | 81W | 86.45 | 91 | 95.55 | 1.4 | 400 | 2300 | 0.25 | 0.1 | 69 |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C

NOTE: MMBZ5233BLT1G, MMBZ5246BLT1G, MMBZ5251BLT1G, and MMBZ5252BLT1G Not Available in 10,000/Tape & Reel.

*Include SZ-prefix devices where applicable.

MMBZ52xxBLT1G Series, SZMMBZ52xxBLT1G Series

TYPICAL CHARACTERISTICS

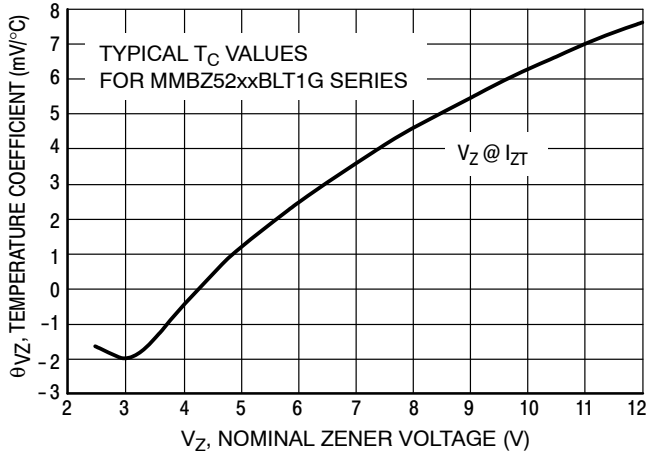


Figure 1. Temperature Coefficients
(Temperature Range -55°C to +150°C)

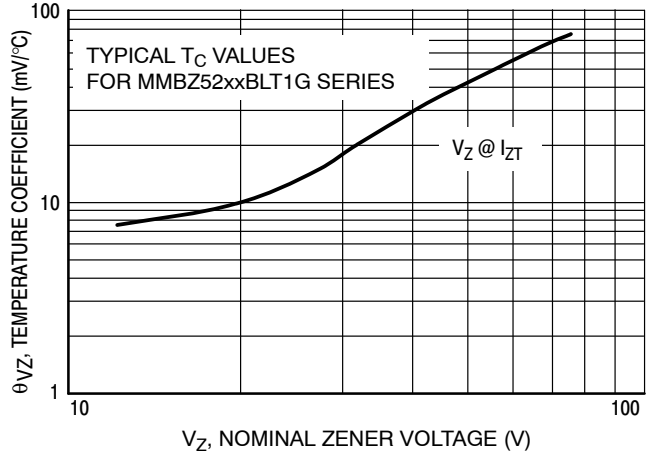


Figure 2. Temperature Coefficients
(Temperature Range -55°C to +150°C)

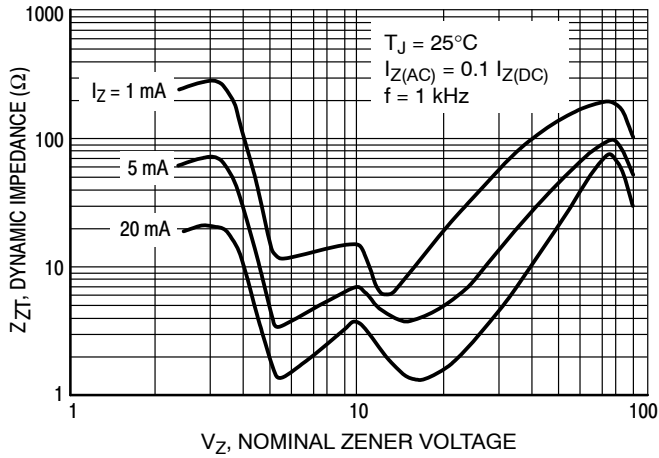


Figure 3. Effect of Zener Voltage on Zener Impedance

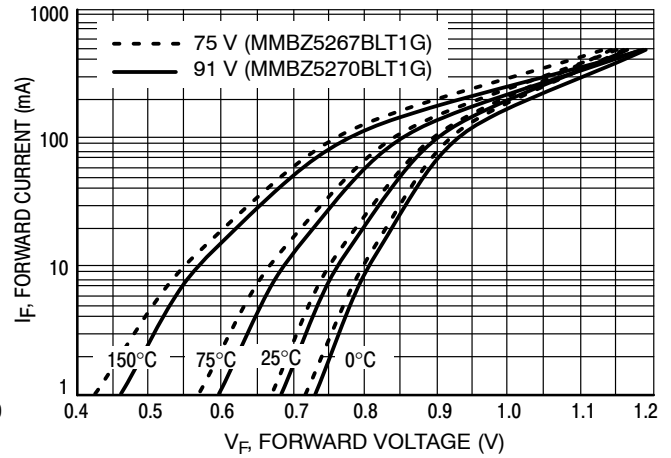


Figure 4. Typical Forward Voltage

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TYPICAL CHARACTERISTICS

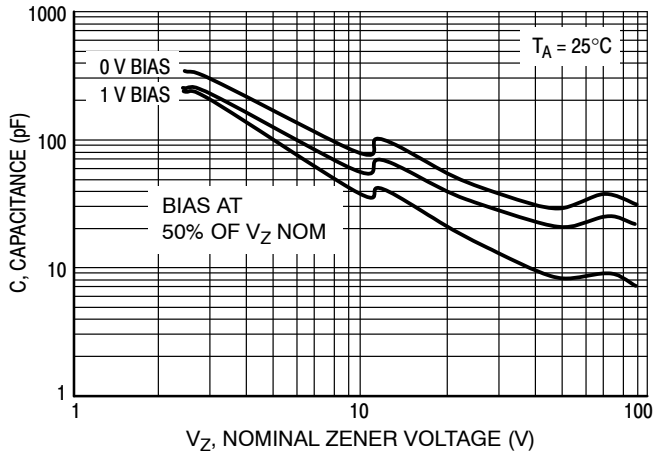


Figure 5. Typical Capacitance

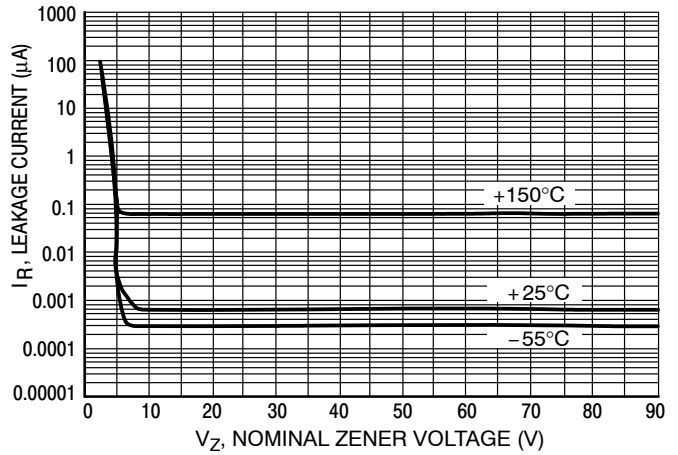


Figure 6. Typical Leakage Current

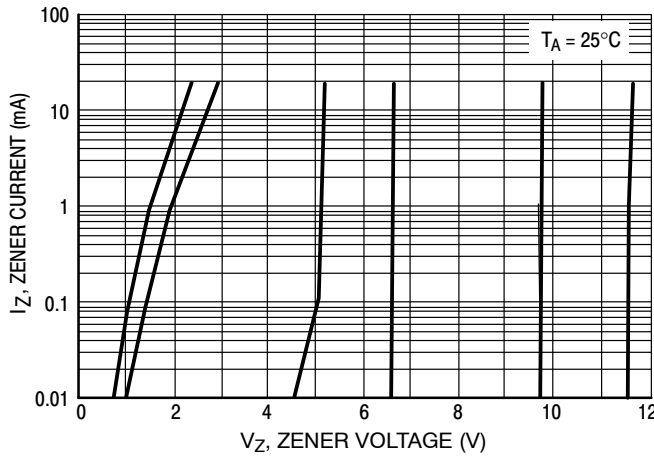


Figure 7. Zener Voltage versus Zener Current (V_Z Up to 12 V)

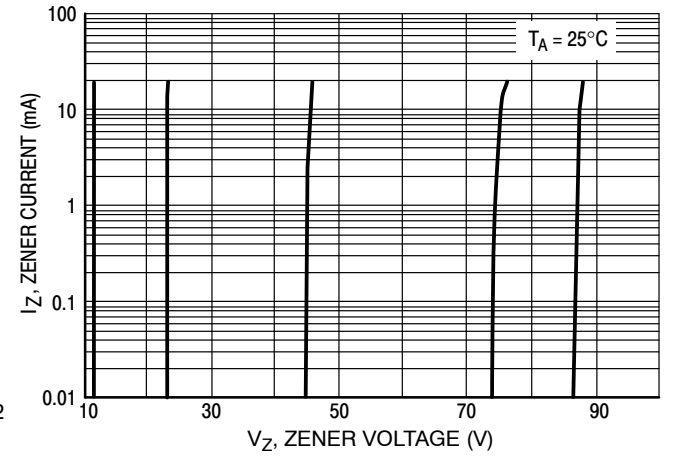


Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)

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