MMBZ52xxBLT1G Series, 
SZMMBZ52xxBLT1G Series

Zener Voltage Regulators
225 mW SOT–23 Surface Mount

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

<table>
<thead>
<tr>
<th>Rating</th>
<th>Symbol</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Power Dissipation on FR–5 Board, Derated above 25°C</td>
<td>$P_D$</td>
<td>225</td>
<td>mW</td>
</tr>
<tr>
<td>Derated above 25°C</td>
<td></td>
<td>1.8</td>
<td>mW/°C</td>
</tr>
<tr>
<td>Thermal Resistance, Junction–to–Ambient</td>
<td>$R_{JUA}$</td>
<td>556</td>
<td>°C/W</td>
</tr>
<tr>
<td>Total Power Dissipation on Alumina Substrate, Derated above 25°C</td>
<td>$P_D$</td>
<td>300</td>
<td>mW</td>
</tr>
<tr>
<td>Derated above 25°C</td>
<td></td>
<td>2.4</td>
<td>mW/°C</td>
</tr>
<tr>
<td>Thermal Resistance, Junction–to–Ambient</td>
<td>$R_{JUA}$</td>
<td>417</td>
<td>°C/W</td>
</tr>
<tr>
<td>Junction and Storage Temperature Range</td>
<td>$T_J$, $T_{stg}$</td>
<td>−65 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

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.

Device Package Shipping

<table>
<thead>
<tr>
<th>Device</th>
<th>Package</th>
<th>Shipping¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMBZ52xxBLT1G</td>
<td>SOT–23</td>
<td>3,000 /</td>
</tr>
<tr>
<td></td>
<td>(Pb–Free)</td>
<td>Tape &amp; Reel</td>
</tr>
<tr>
<td>SZMMBZ52xxBLT1G</td>
<td>SOT–23</td>
<td>3,000 /</td>
</tr>
<tr>
<td></td>
<td>(Pb–Free)</td>
<td>Tape &amp; Reel</td>
</tr>
<tr>
<td>MMBZ52xxBLT3G</td>
<td>SOT–23</td>
<td>10,000 /</td>
</tr>
<tr>
<td></td>
<td>(Pb–Free)</td>
<td>Tape &amp; Reel</td>
</tr>
<tr>
<td>SZMMBZ52xxBLT3G</td>
<td>SOT–23</td>
<td>10,000 /</td>
</tr>
<tr>
<td></td>
<td>(Pb–Free)</td>
<td>Tape &amp; Reel</td>
</tr>
</tbody>
</table>

¹For 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.
ELECTRICAL CHARACTERISTICS
(Pinout: 1-Anode, 2-No Connection, 3-Cathode) (T_A = 25°C unless otherwise noted, V_F = 0.95 V Max. @ I_F = 10 mA)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_Z</td>
<td>Reverse Zener Voltage @ I_ZT</td>
</tr>
<tr>
<td>I_ZT</td>
<td>Reverse Current</td>
</tr>
<tr>
<td>Z_ZT</td>
<td>Maximum Zener Impedance @ I_ZT</td>
</tr>
<tr>
<td>I_ZK</td>
<td>Reverse Current</td>
</tr>
<tr>
<td>Z_ZK</td>
<td>Maximum Zener Impedance @ I_ZK</td>
</tr>
<tr>
<td>I_R</td>
<td>Reverse Leakage Current @ V_R</td>
</tr>
<tr>
<td>V_R</td>
<td>Reverse Voltage</td>
</tr>
<tr>
<td>I_F</td>
<td>Forward Current</td>
</tr>
<tr>
<td>V_F</td>
<td>Forward Voltage @ I_F</td>
</tr>
</tbody>
</table>

Zener Voltage Regulator
## ELECTRICAL CHARACTERISTICS

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

**Device** | **Device Marking** | **Zener Voltage (Note 3)** | **Zener Impedance** | **Leakage Current**
---|---|---|---|---

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Nom</th>
<th>Max</th>
<th>@ I_ZT</th>
<th>Z_I @ I_ZT</th>
<th>Z_OK @ I_OK</th>
<th>I_R @ V_R</th>
</tr>
</thead>
</table>

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

*Include SZ-prefix devices where applicable.*

**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_ZT at an ambient temperature of 25\,^\circ\text{C}**

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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
TYPICAL CHARACTERISTICS

Figure 5. Typical Capacitance

Figure 6. Typical Leakage Current

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

Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)
MMBZ52xxBLT1G Series, SZZMBZ52xxBLT1G Series

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AR

NOTES:
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH.
MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

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RECOMMENDED SOLDERING FOOTPRINT*

DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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