Zero Bias Detector Diode

Features
- Very Low Forward Voltage: 300 mV max. @ 1 mA
- Low Tangential Signal Sensitivity: -42 dBm
- Low Junction Capacitance: 0.2 pF
- High Breakdown Voltage: 3 V
- Available in Beam Lead, Multi-Junction Chip or Packaged
- RoHS* Compliant

Description
The MZB600 zero bias detector (ZBD) diode is a sensitive, very low barrier height Schottky diode designed for use in high frequency, low input power detectors. Its very low barrier height results in excellent sensitivity to very small signals without the need for external bias current. This diode is available as a five-junction common-anode chip, as a single-junction beam lead or packaged in one of several suitable packages. It is manufactured using a proven diode fabrication process which optimizes diode characteristics for optimal electrical performance and excellent reliability.

The low junction capacitance (0.2 pF typical) enables the device to be used in sensitive detector circuits with input signals up to 20 GHz.

This rugged device is capable of reliable operation in all military, commercial and industrial applications.

Electrical Specifications: $T_A = +25^\circ \text{C}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Unit</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage ($V_B$)</td>
<td>$I_R = 100 \mu A$</td>
<td>V</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Voltage ($V_F$)</td>
<td>$I_F = 1 \text{ mA}$</td>
<td>mV</td>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Video Resistance ($R_V$)</td>
<td>$I_F = 75 \text{ mA, 1 GHz}$</td>
<td>Ω</td>
<td></td>
<td>3500</td>
<td></td>
</tr>
<tr>
<td>Junction Capacitance ($C_J$)</td>
<td>$V_R = 0 \text{ V, 1 MHz}$</td>
<td>pF</td>
<td></td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MZB600-C15P-W</td>
<td>chip (400 pc. waffle pack)</td>
</tr>
<tr>
<td>MZB600-B11-GP</td>
<td>beam lead (100 pc. GelPak™)</td>
</tr>
<tr>
<td>MZB600-19-6-W</td>
<td>CS19-6 (100 pc. waffle pack)</td>
</tr>
<tr>
<td>MZB600-19-6-R</td>
<td>CS19-6 (3000 pc. Reel)</td>
</tr>
<tr>
<td>MZB600-32-W</td>
<td>CS32 (100 pc. waffle pack)</td>
</tr>
<tr>
<td>MZB600-32SP</td>
<td>CS32SP-OFHC Cu (100 pc. waffle pack)</td>
</tr>
</tbody>
</table>

1. Contact the factory for other packaging options.

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Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward DC Current</td>
<td>100 mA</td>
</tr>
<tr>
<td>Reverse DC Voltage</td>
<td>3 V</td>
</tr>
<tr>
<td>Total Dissipated Power(^2)</td>
<td>100 mW</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>150°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-55°C to +150°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +200°C</td>
</tr>
</tbody>
</table>

2. Infinite heat sink, \(T_c = 25°C\). Derate power linearly from 750 mW @ 85°C to 0 W @ 175°C.

Environmental Capabilities

The MZB600 ZBD Diode is capable of meeting the environmental requirements of MIL-STD-750 and MIL-STD-883.

ESD & Moisture Sensitivity Level Rating

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD prevention procedures should be followed. The ESD rating for this device is Class 0 (HBM).

Assembly Instructions

Die attach of the common anode chip diodes may be accomplished with eutectic solders, such as 80 Au / 20 Sn, or conductive epoxy. The leads of the beam lead device may be attached to a hybrid circuit using thermo compression bonding or conductive epoxy.
Zero Bias Detector Diode

CS12 / B11

CS32

NOTE:
DIMENSIONS IN INCHES (mm).

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Dimensions in inches (mm)

Cathode Indicator

Epoxy Encapsulation

Wrap Around Termination

Au-Plated Contacts 2 PLCS.

0.012 ± 0.002
(0.30 ± 0.05)
2 PLCS.

0.010
(0.266)
Alumina

0.020 MAX
(0.51 MAX)

0.020 ± 0.003
(0.51 ± 0.08)

0.040 ± 0.003
(1.02 ± 0.08)