Schottky Zero Bias Detector Diode

Features
- P-Type Schottky Diode
- Low Slope Resistance, 6.5 Ω
- Can be used Without External DC Bias
- Large Bondable Contact
- Can be Mounted with Solder or Conductive Epoxy
- RoHS Compliant*

Description
The MADS-011030-14280W is a zero bias detector diode (ZBD). This diode is a bondable die suitable for use in microstrip or stripline detector circuits. These chips can be used in automatic assembly processes due to their 2.5 x 10 mil rectangular gold contact and sturdy construction.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADS-011030-14280W</td>
<td>Waffle Pack</td>
</tr>
</tbody>
</table>


1. Topside metal (cathode contact) thickness: 10 microns Au (Typical)
2. Backside metal (anode contact) thickness: 0.1 micron Au (Typical)
Schottky Zero Bias Detector Diode

Electrical Specifications: \( T_A = +25^\circ C \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage ( (V_F) )</td>
<td>( V_F @ 1 \text{ mA} )</td>
<td>mV</td>
<td>80</td>
<td>100</td>
<td>130</td>
</tr>
<tr>
<td>Voltage Breakdown ( (V_B) )</td>
<td>( V_B @ 1 \text{ mA} )</td>
<td>V</td>
<td>2.5</td>
<td>3.5</td>
<td>—</td>
</tr>
<tr>
<td>Slope Resistance ( (R_D) )</td>
<td>( R_D @ 9.5 \text{ - 10.5 mA} )</td>
<td>Ohms</td>
<td>—</td>
<td>6.5</td>
<td>10</td>
</tr>
<tr>
<td>Capacitance ( (C_T) )</td>
<td>( C_T @ -0.5 \text{ volts} )</td>
<td>pF</td>
<td>—</td>
<td>0.33</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings\(^3,4\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage @ 25°C</td>
<td>2.5 Volts</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +150°C</td>
</tr>
</tbody>
</table>

3. Exceeding any one or combination of these limits may cause permanent damage to this device.

4. MACOM does not recommend sustained operation near these survivability limits.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these HBM Class 0 devices.

Die Handling and Mounting Information

Handling: All semiconductor chips should be handled with care in order to avoid damage or contamination from perspiration, salts, and skin oils. For individual die, the use of plastic tipped tweezers or vacuum pick up tools is strongly recommended. Bulk handling should ensure that abrasion and mechanical shock are minimized.

Die Attach: The die have Ti-Pt-Au back metal and gold plated contact metal. Die can be mounted with a gold-tin, eutectic solder preform or conductive silver epoxy.

Eutectic Die Attachment Using Hot Gas Die Bonder: An 80/20, gold tin eutectic solder perform is recommended with a work surface temperature of 255°C and a tool tip temperature of 220°C. When the hot gas is applied, the temperature at the tool tip should be approximately 290°C.

Eutectic Die Attachment Using Reflow Oven: See Application Note M541, “Bonding and Handling Procedures for Chip Diode Devices”.

Epoxy Die Attachment: A thin, controlled amount of electrically conductive silver epoxy should be applied at approximately a 1-2 mils thickness to minimize ohmic and thermal resistances. A thin epoxy fillet should be visible around the perimeter of the chip after placement to ensure full area coverage. Cure conductive epoxy per manufacturer’s schedule.

Wire Bonding: 0.001” diameter gold wire is recommended with a stage temperature of 150°C and minimal force. Ultrasonic energy should be adjusted to the minimum required. Automatic ball bonding can also be used.
Schottky Zero Bias Detector Diode

MACOM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with MACOM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.