MA4E2200 Series

Surface Mount Zero Bias Schottky Diodes

Features
- Designed for High Volume, Low Cost Detector Applications
- Available in Single and Series Pair Configurations
- Small Profile Surface Mount Packages
- Tape and Reel Deliverable
- RoHS* Compliant with 260°C Reflow Capability

Description and Applications
The MA4E2200 series are silicon zero bias P-type detector diodes assembled in low cost surface mount plastic packages. They are designed for usage in a wide variety of detector applications.

The MA4E2200 series of zero bias detector diodes are available in series pair configurations in the SOT-23 (case style 287) and are also available in a single configuration in the SOD-323 (case style 1141) and the SC-79 (1279).

The part number consists of the base number MA4E2200, followed by the wiring configuration (A, B, D), the package style (287, 1141) and a “T” for tape and reel. The SC-79 part number is MADS-002200-12790T.

The small diode package size and moderate parasitics make these parts ideal for low leakage limiters and RF temperature compensated envelope detectors for RF ID tags applications up to 4 GHz.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA4E2200A1-1141T</td>
<td>SOD-323</td>
</tr>
<tr>
<td>MA4E2200B1-287T</td>
<td>SOT-23</td>
</tr>
<tr>
<td>MA4E2200D1-287T</td>
<td>SOT-23</td>
</tr>
<tr>
<td>MADS-002200-12790T</td>
<td>SC-79</td>
</tr>
</tbody>
</table>

Surface Mount Zero Bias Schottky Diodes

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Electrical Specifications @ +25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage Breakdown (V_B)</td>
<td>I_R = 100 µA</td>
<td>1.5 V min.</td>
</tr>
<tr>
<td>Forward Voltage (V_F)</td>
<td>I_F = 1 mA</td>
<td>60 - 120 mV max.</td>
</tr>
<tr>
<td></td>
<td>I_F = 10 mA</td>
<td>150 - 220 mV max.</td>
</tr>
<tr>
<td>Delta Forward Voltage (D V_F)</td>
<td>I_F = 1 mA</td>
<td>10 mV max.</td>
</tr>
<tr>
<td>Total Capacitance (C_T)</td>
<td>V_R = 0.15 V</td>
<td>0.25 pF typ.</td>
</tr>
<tr>
<td>Video Resistance (R_v)</td>
<td>—</td>
<td>7000 Ω typ.</td>
</tr>
</tbody>
</table>

Maximum Ratings @ 25°C (unless otherwise specified)^1,2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW RF Incident Power</td>
<td>75 mW</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>1.5 V</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>+175°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-65°C to +125°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
</tbody>
</table>

1. Operation of this device above any one of the Maximum Rated parameters may cause permanent damage.
2. Please refer to Application Note M538 for surface mounting instructions.
Circuit Models

SOT-23

SOD-323

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MA4E2200 Series
Surface Mount Zero Bias Schottky Diodes

Case Styles

**SOT-23**

![SOT-23 Diagram]

Package Parasitics
Ls = 1.4 nH
Cp = 0.12 pF

**SOT-23 (Case Style 287)**

<table>
<thead>
<tr>
<th>DIM.</th>
<th>INCHES</th>
<th>MILLIMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN.</td>
<td>MAX.</td>
</tr>
<tr>
<td>A</td>
<td>—</td>
<td>0.048</td>
</tr>
<tr>
<td>B</td>
<td>—</td>
<td>0.008</td>
</tr>
<tr>
<td>C</td>
<td>—</td>
<td>0.040</td>
</tr>
<tr>
<td>D</td>
<td>0.013</td>
<td>0.020</td>
</tr>
<tr>
<td>E</td>
<td>0.003</td>
<td>0.006</td>
</tr>
<tr>
<td>F</td>
<td>0.110</td>
<td>0.119</td>
</tr>
<tr>
<td>G</td>
<td>0.047</td>
<td>0.056</td>
</tr>
<tr>
<td>H</td>
<td>0.037</td>
<td>typical</td>
</tr>
<tr>
<td>J</td>
<td>0.075</td>
<td>typical</td>
</tr>
<tr>
<td>K</td>
<td>—</td>
<td>0.103</td>
</tr>
<tr>
<td>L</td>
<td>—</td>
<td>0.024</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIM.</th>
<th>GRADIENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>10° max.3</td>
</tr>
<tr>
<td>N</td>
<td>2°...30°</td>
</tr>
</tbody>
</table>

3. Applicable on all sides

**SOD-323**

![SOD-323 Diagram]

Package Parasitics
Ls = 1.2 nH
Cp = 0.11 pF

**SOD-323 (Case Style 1141)**

<table>
<thead>
<tr>
<th>DIM.</th>
<th>INCHES</th>
<th>MILLIMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN.</td>
<td>MAX.</td>
</tr>
<tr>
<td>A</td>
<td>—</td>
<td>0.043</td>
</tr>
<tr>
<td>B</td>
<td>—</td>
<td>0.004</td>
</tr>
<tr>
<td>C</td>
<td>—</td>
<td>0.008</td>
</tr>
<tr>
<td>D</td>
<td>0.010</td>
<td>0.016</td>
</tr>
<tr>
<td>E</td>
<td>0.003</td>
<td>0.006</td>
</tr>
<tr>
<td>F</td>
<td>0.063</td>
<td>0.075</td>
</tr>
<tr>
<td>G</td>
<td>0.045</td>
<td>0.057</td>
</tr>
<tr>
<td>H</td>
<td>0.091</td>
<td>0.106</td>
</tr>
</tbody>
</table>
Case Styles (Cont’d)

SC-79

Package Parasitics
Ls = 0.6 nH
Cp = 0.10 pF

SC-79 (Case Style 1279)

<table>
<thead>
<tr>
<th>DIM.</th>
<th>MIN. (INCHES)</th>
<th>MAX. (INCHES)</th>
<th>MIN. (MILLIMETERS)</th>
<th>MAX. (MILLIMETERS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.020</td>
<td>0.028</td>
<td>0.50</td>
<td>0.71</td>
</tr>
<tr>
<td>B</td>
<td>0.003</td>
<td>0.008</td>
<td>0.08</td>
<td>0.20</td>
</tr>
<tr>
<td>C</td>
<td>0.006</td>
<td>0.010</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>D</td>
<td>0.010</td>
<td>0.014</td>
<td>0.25</td>
<td>0.36</td>
</tr>
<tr>
<td>E</td>
<td>0.059</td>
<td>0.067</td>
<td>0.08</td>
<td>0.15</td>
</tr>
<tr>
<td>F</td>
<td>0.043</td>
<td>0.051</td>
<td>1.10</td>
<td>1.30</td>
</tr>
<tr>
<td>G</td>
<td>0.011</td>
<td>0.012</td>
<td>0.28</td>
<td>0.30</td>
</tr>
<tr>
<td>H</td>
<td>0.037</td>
<td>0.043</td>
<td>0.94</td>
<td>1.09</td>
</tr>
<tr>
<td>I</td>
<td>0.027</td>
<td>0.035</td>
<td>0.68</td>
<td>0.96</td>
</tr>
</tbody>
</table>
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