Features
- 3 Terminal LPF Broadband Shunt Structure
- Low Slope Resistance, 7 Ω
- +30 dBm Peak and CW Power Handling
- 0.6 dB Shunt Insertion Loss
- +20 dBm Flat Leakage Power
- Lead-Free 1.5 x 1.2 mm 6-lead TDFN Package
- RoHS* Compliant and 260°C Reflow Compatible

Description
The MADS-011010 is a Schottky limiter assembled in a lead-free 1.5 x 1.2 mm TDFN surface mount plastic package. This device provides broadband performance as well as exceptional lower flat leakage power.

The MADS-011010 is ideally suitable for higher frequency and lower flat leakage limiter applications where higher performance surface mount diode assemblies are required.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADS-011010-14150T</td>
<td>3000 piece reel</td>
</tr>
<tr>
<td>MADS-011010-000SMB</td>
<td>Sample board</td>
</tr>
</tbody>
</table>

1. Reference Application Note M513 for reel size information.
2. All RF Sample boards include 5 loose parts.

Functional Schematic

Pin Configuration

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/C</td>
<td>No Connection</td>
</tr>
<tr>
<td>2</td>
<td>RF_IN</td>
<td>RF Input</td>
</tr>
<tr>
<td>3</td>
<td>N/C</td>
<td>No Connection</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
<td>No Connection</td>
</tr>
<tr>
<td>5</td>
<td>RF_OUT</td>
<td>RF Output</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
<td>No Connection</td>
</tr>
<tr>
<td>7</td>
<td>Paddle</td>
<td>Ground</td>
</tr>
</tbody>
</table>

3. MACOM recommends connecting unused package pins to ground.
4. The exposed pad centered on the package bottom must be connected to RF, DC, and thermal ground.

Absolute Maximum Ratings

Parameter | Absolute Maximum
---|---
Peak & CW Incident Power<br>1 µs pulse, 0.1% duty @ +85°C | +27 dBm
Junction Temperature | 175°C
Operating Temperature | -65°C to +125°C
Storage Temperature | -65°C to +150°C

Handling Procedures
Please observe the following precautions to avoid damage:

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

5. Both Source and Load VSWR <1.2:1 at Peak and CW Incident Power.
6. High power output parameters are tested with RF evaluation board component values defined on PCB schematic, pg. 4.

7. Exceeding any one or combination of these limits may cause permanent damage to this device.
8. MACOM does not recommend sustained operation near these survivability limits.
Schottky Limiter
DC - 6 GHz

Typical Performance Curves

**Insertion Loss vs. Frequency**

**Flat Leakage Power @ CW, 1 GHz**

**Input Return Loss vs. Frequency**

**Output Return Loss vs. Frequency**

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- India Tel: +91.80.43537383
- China Tel: +86.21.2407.1588
Schottky Limiter
DC - 6 GHz

Parts List

<table>
<thead>
<tr>
<th>Part</th>
<th>Value</th>
<th>Case Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2</td>
<td>100 pF</td>
<td>0402</td>
</tr>
<tr>
<td>L1</td>
<td>27 nH</td>
<td>0402</td>
</tr>
</tbody>
</table>

Lead-Free 1.5 x 1.2 mm 6-Lead TDFN†

† Reference Application Note S2083 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin over copper.
Applications Section

Schematic of 3 Stage Limiter using MADS-011010-14150T

\[ F = 1 - 4 \text{ GHz}, P_{in} = +40 \text{ dBm CW}, +43 \text{ dBm}, 5 \mu s, 1\% \text{ duty} \]

\[ \text{RF}_{\text{IN}} \rightarrow C1 \rightarrow D1 \rightarrow \text{RF}_{\text{OUT}} \]

\[ \text{RF}_{\text{IN}} \rightarrow D2 \rightarrow \text{RF}_{\text{OUT}} \]

\[ \text{RF}_{\text{IN}} \rightarrow D3 \rightarrow \text{RF}_{\text{OUT}} \]

Parts List

<table>
<thead>
<tr>
<th>Part</th>
<th>Part # / Value</th>
<th>Case Style</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>MADP-011029-14150T</td>
<td>ODS-1415</td>
<td>Input PIN Diode</td>
<td>1</td>
</tr>
<tr>
<td>D2</td>
<td>MADL-011021-14150T</td>
<td>ODS-1415</td>
<td>2\textsuperscript{nd} Stage PIN Diode</td>
<td>1</td>
</tr>
<tr>
<td>D3</td>
<td>MADS-011010-14150T</td>
<td>ODS-1415</td>
<td>3\textsuperscript{rd} Stage Schottky Limiter</td>
<td>1</td>
</tr>
<tr>
<td>C1, C2</td>
<td>22 pF</td>
<td>0402</td>
<td>DC Block</td>
<td>2</td>
</tr>
</tbody>
</table>