320 W Peak Power Limiter
1 - 2 GHz

Features
- +55 dBm Peak Power Handling @ +85°C
- +53 dBm CW Power Handling @ +85°C
- 0.35 dB Insertion Loss (1.2 - 1.4 GHz)
- 19 dB Return Loss (1.2 - 1.4 GHz)
- +19 dBm Flat Leakage Power
- Lead-Free 10.1 x 6.2 x 3.2 mm³ Package
- RoHS* Compliant and 260°C Reflow Compatible
- Hermetic Seal

Description
The MADL-011014 is a lead-free surface mount, high power limiter which integrates the equivalent of 19 PIN, Schottky, limiter diodes, capacitors, inductors, and resistors in a compact ceramic package. This device provides superior low and high signal performance from 1 - 2 GHz without DC bias.

The MADL-011014 is ideally suitable for higher peak and CW power receiver-protector microwave circuits applications where higher performance surface mount limiter assemblies are required.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADL-011014-001000</td>
<td>Hermetic Seal¹</td>
</tr>
<tr>
<td>MADL-011014-001SMB</td>
<td>Sample board (Hermetic Seal Limiter)</td>
</tr>
</tbody>
</table>

¹ Hermetic Seal provides fine leak rate < 5x10⁻⁸ atm·cc/s.

320 W Peak Power Limiter
1 - 2 GHz

Electrical Specifications: $T_A = +25^\circ\text{C}$, $Z_0 = 50 \, \Omega$ (unless otherwise defined)

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Incident Power</td>
<td>+55 dBm</td>
</tr>
<tr>
<td>3 ms pulse, 10% duty @ +85°C</td>
<td></td>
</tr>
<tr>
<td>CW Incident Power at +85°C</td>
<td>+53 dBm</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>

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. MACOM does not recommend sustained operation near these survivability limits.
6. Operating at nominal conditions with $T_J \leq +175^\circ\text{C}$ will ensure MTTF $> 1 \times 10^8$ hours.

### Typical Performance Curve

**Pulse Width vs. Peak Input Power @ +85°C**
(10% Duty Cycle, 1.3 GHz)
Typical Performance Curves

**Insertion Loss vs. Frequency**

![Graph showing insertion loss vs. frequency for different temperatures (+25°C, -40°C, +85°C).]

**Input Return Loss vs. Frequency**

![Graph showing input return loss vs. frequency for different temperatures (+25°C, -40°C, +85°C).]

**Pulsed Flat Leakage Power vs. P\textsubscript{IN}**

(3 ms Pulse, 10% Duty Cycle, 1.3 GHz)

![Graph showing pulsed flat leakage power vs. incident power for different temperatures (+25°C, -40°C, +85°C).]

**CW Flat Leakage Power vs. P\textsubscript{IN} @ 1.3 GHz**

![Graph showing CW flat leakage power vs. incident power at 1.3 GHz for different temperatures (+25°C, -40°C, +85°C).]

**Pulsed Spike Leakage Power vs. P\textsubscript{IN}**

(3 ms Pulse, 10% Duty Cycle, 1.3 GHz)

![Graph showing pulsed spike leakage power vs. incident power for different temperatures (+25°C, -40°C, +85°C).]

**Pulsed 3 dB Recovery Time vs. P\textsubscript{IN}**

(3 ms Pulse, 10% Duty Cycle, 1.3 GHz)

![Graph showing pulsed 3 dB recovery time vs. incident power for different temperatures (+25°C, -40°C, +85°C).]
**320 W Peak Power Limiter**

**1 - 2 GHz**

---

**SMB Layout**

**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 HBM Class 1C devices.

---

**Lead-Free 10.1 x 6.2 x 3.2 mm³ 2-Lead package†**

† Reference Application Note S2083 for lead-free solder reflow recommendations. Plating is Au over Ni over Cu.

---

M/A-COM 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](http://www.macom.com) for additional data sheets and product information.
Application Section

Transmit-Receive Block Diagram
using the L Band MADL-011014 Limiter

Ant

Circulator

MAGX-001214
GaN PA

Circulator

50 Ω High Power Load

MADL-011014
Limiter

MAAL-010705
LNA

For further information and support please visit:
https://www.macom.com/support

M/A-COM 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.