MML033
GaAs MMIC
Low Noise Amplifier
8-12GHz

Features
• Single Biasing Voltage (Self Biased)
• Frequency: 8-12GHz
• Small Signal Gain: 21.5dB
• Noise Figure: 0.9 dB max.
• P1dB: 8dBm
• Power supply: +5V/30mA
• Input/Output: 50Ω
• Die Size: 2.0 x 1.25 x 0.1 mm

Typical Applications
• Test Instrumentation
• Microwave Radio & VSAT
• Military & Space
• Telecom Infrastructure
• Fiber Optics

Functional Block Diagram

Electrical Specifications
TA = +25°C, Vd = +5V

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td>8-12</td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Small Signal Gain</td>
<td></td>
<td>21.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>±0.2</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td></td>
<td></td>
<td>0.9</td>
<td>dB</td>
</tr>
<tr>
<td>Output 1dB Compression (P1dB)</td>
<td>6.5</td>
<td>8</td>
<td>9</td>
<td>dBm</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>11</td>
<td>15</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>2</td>
<td>25</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>Static current</td>
<td></td>
<td>32</td>
<td></td>
<td>mA</td>
</tr>
</tbody>
</table>
Gain vs. Frequency

Noise Figure vs. Frequency

Input Return Loss vs. Frequency

Output Return Loss vs. Frequency

Reverse Isolation vs. Frequency

P1dB vs. Frequency
**Low Noise Amplifier - MMIC 8-12GHz**

**Outline Drawing:**
All Dimensions in μm

---

**Pad Description**

<table>
<thead>
<tr>
<th>Pad</th>
<th>Function</th>
<th>Description</th>
<th>Equivalent Circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RF IN</td>
<td>RF signal input terminal, no blocking capacitor required.</td>
<td><img src="image" alt="RF_IN_Circuit" /></td>
</tr>
<tr>
<td>2</td>
<td>RF OUT</td>
<td>RF signal output terminal, no blocking capacitor required.</td>
<td><img src="image" alt="RF_OUT_Circuit" /></td>
</tr>
<tr>
<td>3</td>
<td>VDD</td>
<td>Amplifier drain bias; external 100pF bypass capacitor required.</td>
<td><img src="image" alt="VDD_Circuit" /></td>
</tr>
<tr>
<td>Die</td>
<td>GND</td>
<td>Die bottom must be connected to RF/DC ground.</td>
<td><img src="image" alt="GND_Circuit" /></td>
</tr>
</tbody>
</table>
Assembly Drawing

Notes:
1. Die thickness: 100um
2. Typical bond pad is 100*100 μm²
3. Bond pad metalization: Gold
4. Backside metalization: Gold
5. Backside of the die (GND)
6. No connection required for unlabeled bond pads

Maximum Ratings:
1. Maximum drain voltage: +7V
2. Maximum input power: +20dBm
3. Operating temperature: -55°C to +85°C
4. Storage temperature: -65°C to +150°C