**MML053**

**GaAs MMIC**

**Low Noise Amplifier**

18-40GHz

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**Features**

- Frequency: 18-40GHz
- Small Signal Gain: 15dB (positive slope)
- Noise Figure: 3.0dB max.
- P1dB: 5dBm
- Power supply: +5V/45mA
- Input/Output: 50Ω
- Die Size: 2.25 x 1.6 x 0.09 mm

**Typical Applications**

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

**Functional Block Diagram**

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**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>18-40</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Small Signal Gain</td>
<td>13.5</td>
<td>15</td>
<td>17.5</td>
<td>dB</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>±2.0</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>-</td>
<td>-</td>
<td>3.0</td>
<td>dB</td>
</tr>
<tr>
<td>Output 1dB Compression (P1dB)</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>dBm</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>15</td>
<td>18</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>20</td>
<td>25</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Static current</td>
<td></td>
<td>45</td>
<td></td>
<td>mA</td>
</tr>
</tbody>
</table>
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Gain vs. Frequency

Noise Figure vs. Frequency

Input Return Loss vs. Frequency

Output Return Loss vs. Frequency

Reverse Isolation vs. Frequency

P1dB vs. Frequency
### 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="image1.png" alt="RF IN Equivalent Circuit" /></td>
</tr>
<tr>
<td>2</td>
<td>RF OUT</td>
<td>RF signal output terminal, no blocking capacitor required.</td>
<td><img src="image2.png" alt="RF OUT Equivalent Circuit" /></td>
</tr>
<tr>
<td>3</td>
<td>VD</td>
<td>Amplifier drain bias; external 100pF bypass capacitor required. Single-side power supply, only the Vd side for bonding.</td>
<td><img src="image3.png" alt="VD Equivalent Circuit" /></td>
</tr>
<tr>
<td>Die bottom</td>
<td>GND</td>
<td>Die bottom must be connected to RF/DC ground.</td>
<td><img src="image4.png" alt="GND Equivalent 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