**Features**
- Frequency: DC-20GHz
- Small Signal Gain: 18dB
- Noise Figure: 2.0dB typ./3.5dB max.
- P1dB: 16dBm
- Power supply: +8V/80mA
- Input/Output: 50Ω
- Die Size: 3.3 x 1.3 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 = +8V**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>DC-20</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Small Signal Gain</td>
<td>17.5</td>
<td>18</td>
<td>19</td>
<td>dB</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>±0.75</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>-</td>
<td>2.0</td>
<td>3.5</td>
<td>dB</td>
</tr>
<tr>
<td>Output 1dB Compression (P1dB)</td>
<td>15.5</td>
<td>16</td>
<td>17</td>
<td>dBm</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>22</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>20</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Static Current</td>
<td>80</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
</tbody>
</table>
GaAs MMIC
Low Noise Amplifier
DC-20GHz

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; blocking capacitor required.</td>
<td><img src="#" alt="RF IN" /></td>
</tr>
<tr>
<td>2</td>
<td>RF OUT</td>
<td>RF signal output terminal; blocking capacitor required.</td>
<td><img src="#" alt="RF Out" /></td>
</tr>
<tr>
<td>3</td>
<td>VD</td>
<td>Amplifier drain bias; external 100pF bypass capacitor required.</td>
<td><img src="#" alt="VD" /></td>
</tr>
<tr>
<td>4</td>
<td>VG</td>
<td>Amplifier gate bias; external 100pF bypass capacitor required.</td>
<td><img src="#" alt="VG" /></td>
</tr>
<tr>
<td>Die bottom</td>
<td>GND</td>
<td>Die bottom must be connected to RF/DC ground.</td>
<td><img src="#" alt="GND" /></td>
</tr>
</tbody>
</table>

**Outline Drawing:**
All Dimensions in μm

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**MML046**

**GaAs MMIC**

**Low Noise Amplifier**

**DC-20GHz**

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MILLER MMIC LLC.  
www.millermmic.com  
Sales: sales@millermmic.com
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: +12V
2. Maximum input power: +20dBm
3. Operating temperature: -55°C to +85°C
4. Storage temperature: -65°C to +150°C