**Features**
- 2dB Positive Slope
- Noise Figure: 2.5dB
- Gain: 17dB
- P1dB: +16dBm
- Biasing: +8V @ 67 mA
- Impedance: 50Ω
- Die Size: 3 x 1.3 x 0.1 mm

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

**Electrical Specifications**

TA = +25°C, VD = +8V VG= -1V * Idd = 67mA *

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</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>DC - 6</td>
<td>6 - 12</td>
<td>12 - 20</td>
<td>GHz</td>
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<tr>
<td>Gain</td>
<td>16.2</td>
<td>16.5</td>
<td>17.3</td>
<td>dB</td>
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<tr>
<td>Gain Flatness</td>
<td>±0.25</td>
<td>±0.4</td>
<td>±0.5</td>
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<tr>
<td>Input Return Loss</td>
<td>20</td>
<td>20</td>
<td>18</td>
<td>dB</td>
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<tr>
<td>Output Return Loss</td>
<td>18</td>
<td>20</td>
<td>18</td>
<td>dB</td>
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<tr>
<td>Output 1dB Compression (P1dB)</td>
<td>17.5</td>
<td>17.5</td>
<td>15.5</td>
<td>dBm</td>
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<td>Saturated Output Power (Psat)</td>
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<td>dBm</td>
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<tr>
<td>Output Third Order Intercept (IP3)</td>
<td>27</td>
<td>27</td>
<td>25</td>
<td>dBm</td>
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<td>Noise Figure</td>
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<td>2</td>
<td>2.2</td>
<td>dB</td>
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<tr>
<td>Current</td>
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<td>67</td>
<td>67</td>
<td>mA</td>
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</table>

* Adjust VG (-2V~0V) to obtain device current of near 67mA.
GaAs pHEMT MMIC
Low Noise Amplifier
DC-20GHz

Gain

Return Loss

Noise Figure

Output Power $P_{1}$

MML013 GaAs pHEMT MMIC Low Noise Amplifier DC-20GHz

Gain vs Frequency

Return Loss vs Frequency

Noise Figure vs Frequency

Output Power $P_{1}$ vs Frequency
Outline Drawing:
All Dimensions in mm

Pad Description

<table>
<thead>
<tr>
<th>PAD</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IN</td>
<td>This pad is DC coupling, 50 ohm matching. It needs extra 100pF blocking capacitor.</td>
</tr>
<tr>
<td>2</td>
<td>VD</td>
<td>This pad supplies power supply for the amplifier. It needs extra 1000pF bypass capacitor.</td>
</tr>
<tr>
<td>3</td>
<td>ACG1</td>
<td>This pad is low frequency signal filter port. It needs extra 0.1uF bypass capacitor.</td>
</tr>
<tr>
<td>4</td>
<td>OUT</td>
<td>This pad is DC coupling, 50 ohm matching. It needs extra 100pF blocking capacitor.</td>
</tr>
<tr>
<td>5</td>
<td>ACG2</td>
<td>This pad is low frequency signal filter port. It needs extra 1000pF bypass capacitor.</td>
</tr>
<tr>
<td>6</td>
<td>VG</td>
<td>This pad supplies gate voltage. It needs extra 1000pF and 0.01uF bypass capacitor.</td>
</tr>
<tr>
<td>Die Bottom</td>
<td>GND</td>
<td>Die backside must connect to RF/DC GND.</td>
</tr>
</tbody>
</table>
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. Power supply voltage: +9V
2. RF input power: +18dBm
3. Storage temperature: -65°C to +175°C
4. Operating temperature: -55°C to +85°C