**Features**
- Single Biasing Voltage (Self Biased)
- Frequency: 22-32GHz
- Small Signal Gain: 19.5dB
- Noise Figure: 2.1 dB typ./2.3dB max.
- P1dB: 6dBm
- Power Supply: +5V/12mA
- Input/Output: 50Ω
- Die Size: 1.85 x 0.95 x 0.09 mm

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

**Functional Block Diagram**

**Electrical Specifications**

\[ TA = +25^\circ C, \ V_d = +5V \]

<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>22-32</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Small Signal Gain</td>
<td>18</td>
<td>19.5</td>
<td>21</td>
<td>dB</td>
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<tr>
<td>Gain Flatness</td>
<td>±1.5</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>-</td>
<td>2.1</td>
<td>2.3</td>
<td>dB</td>
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<tr>
<td>Output 1dB Compression (P1dB)</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>dBm</td>
</tr>
<tr>
<td>Saturated Output Power (Psat)</td>
<td>6.5</td>
<td>8</td>
<td>9.5</td>
<td>dBm</td>
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<tr>
<td>Input Return Loss</td>
<td>9</td>
<td>10</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>14</td>
<td>15</td>
<td>-</td>
<td>dB</td>
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<tr>
<td>Static current</td>
<td>12</td>
<td></td>
<td></td>
<td>mA</td>
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</table>
MM241PD
GaAs MMIC
0.5 - 18 GHz

V1.0.0

1-BIT DIGITAL CONTROL ATTENUATOR
– MMIC 0.5 - 18GHz

Gain vs. Frequency
Noise Figure vs. Frequency

Input Return Loss vs. Frequency
Output Return Loss vs. Frequency

Reverse Isolation vs. Frequency
P1dB/Psat vs. Frequency

Low Noise Amplifier
MMIC 22-32GHz

MML065
Low Noise Amplifier - MMIC 22-32GHz
## 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="#" alt="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="#" alt="Equivalent Circuit" /></td>
</tr>
<tr>
<td>3</td>
<td>Vd</td>
<td>Amplifier drain bias; external 100pF bypass capacitor required.</td>
<td><img src="#" alt="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="#" alt="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