MM5003

**GaAs pHEMT MMIC**

1-Bit Digital Control Attenuator

0.5-18GHz

**Features**
- Attenuation Range: 16dB
- Attenuation Accuracy: ±0.6dB
- Insertion Loss: 1dB
- Impedance: 50Ω
- Die Size: 1.0 x 1.0 x 0.1 mm

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

**Electrical Specifications**

TA = +25°C, Vctl = 0/-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>0.5-18</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td></td>
<td>1</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Attenuation Range</td>
<td></td>
<td>16</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Attenuation Accuracy</td>
<td>±0.6</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Return Loss</td>
<td></td>
<td>20</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Input 1dB Compression (P1dB)</td>
<td></td>
<td>24</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Switching Speed</td>
<td></td>
<td>30</td>
<td></td>
<td>ns</td>
</tr>
</tbody>
</table>
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0.5-18GHz

V1.0.0
GaAs pHEMT MMIC

Attenuation

Insertion Loss

Return Loss

Return Loss

Normalized Attenuation

Insertion Loss

RF1
RF2

RF1
RF2
**Pad Description**

<table>
<thead>
<tr>
<th>PAD</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RF1</td>
<td>This pad is RF port and matched to 50Ω impedance.</td>
</tr>
<tr>
<td>2</td>
<td>RF2</td>
<td>This pad is RF port and matched to 50Ω impedance.</td>
</tr>
<tr>
<td>3,4,5</td>
<td>A,B,A</td>
<td>( A = -5 \text{ V}, B = 0 \text{ V}, ) pass-through; ( A=0\text{V},B= -5\text{V}, ) decaying 16dB.</td>
</tr>
<tr>
<td>Die Bottom</td>
<td>GND</td>
<td>Die bottom must be connected to RF/DC ground.</td>
</tr>
</tbody>
</table>
Assembly Drawing

50 0hm microstrip

3mil assembling clearance

1 mil gold wire

1 mil gold wire

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. RF input power: +24dBm
2. Storage temperature: -65°C to +175°C
3. Operating temperature: -55°C to +85°C