HMC-C002
WIDEBAND LNA MODULE
2 - 20 GHz

Features
- Noise Figure: 2 dB @ 8 GHz
- Flat Gain: 13 dB ± 0.5 dB
- P1dB Output Power: +18 dBm @ 8 GHz
- 50 Ohm Matched Input/Output
- Regulated Supply and Bias Sequencing
- Hermetically Sealed Module
- Field Replaceable SMA connectors
- -55 °C to +85 °C Operating Temperature

General Description
The HMC-C002 is a GaAs MMIC pHEMT Low Noise Distributed Amplifier in a miniature, hermetic module with replaceable SMA connectors which operates between 2 and 20 GHz. The self-biased amplifier provides 13 dB of gain, 2 to 3 dB noise figure and up to +18 dBm of output power at 1 dB gain compression while requiring a single +12V supply. Gain flatness is excellent from 2 - 18 GHz making the HMC-C002 ideal for EW, ECM RADAR and test equipment applications. The wideband amplifier I/Os are internally matched to 50 Ohms and are internally DC blocked.

Functional Diagram

Typical Applications
The HMC-C002 Wideband LNA is ideal for:
- Telecom Infrastructure
- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics

Electrical Specifications, \( T_A = +25^\circ \text{C}, \text{Vs}= +11.6\text{V to } +12.4\text{V} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>2.0</td>
<td>6.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Gain</td>
<td>12</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>±0.25</td>
<td>±0.5</td>
<td></td>
</tr>
<tr>
<td>Gain Variation Over Temperature</td>
<td>0.008</td>
<td>0.015</td>
<td>0.008</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>2.5</td>
<td>4.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>17</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>12</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Output Power for 1 dB Compression (P1dB)</td>
<td>15</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>Saturated Output Power (Psat)</td>
<td>21.5</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Output Third Order Intercept (IP3)</td>
<td>26.5</td>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>Spurious Response</td>
<td>-50</td>
<td>-60</td>
<td>-60</td>
</tr>
<tr>
<td>Supply Current</td>
<td>93</td>
<td>93</td>
<td>93</td>
</tr>
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</table>

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**Gain & Return Loss**

Gain vs. Temperature

Input Return Loss vs. Temperature

Output Return Loss vs. Temperature

Reverse Isolation vs. Temperature

Noise Figure vs. Temperature

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**Pin Descriptions**

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Function</th>
<th>Description</th>
<th>Interface Schematic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RFIN &amp; RF Ground</td>
<td>RF input connector, SMA female, field replaceable. This pin is AC coupled and matched to 50 Ohms.</td>
<td>![RF input connector schematic]</td>
</tr>
<tr>
<td>2</td>
<td>Vs</td>
<td>Power supply voltage for the amplifier.</td>
<td>![Power supply schematic]</td>
</tr>
<tr>
<td>3</td>
<td>RFOUT &amp; RF Ground</td>
<td>RF output connector, SMA female. This pin is AC coupled and matched to 50 Ohms.</td>
<td>![RF output connector schematic]</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Power supply ground.</td>
<td>![Ground schematic]</td>
</tr>
</tbody>
</table>

**Absolute Maximum Ratings**

- **Bias Supply Voltage (Vs)**: +11 Vdc to +13 Vdc
- **RF Input Power (RFIN)**: +18 dBm
- **Storage Temperature**: -65 to +150 °C
- **Operating Temperature**: -55 to +85 °C

**WARNING**

ELECTROSTATIC SENSITIVE DEVICE

**OBSERVE HANDLING PRECAUTIONS**

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Outline Drawing

Package Information

<table>
<thead>
<tr>
<th>Package Type</th>
<th>C-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Weight [^{[1]}]</td>
<td>11.2 gms [^{[2]}]</td>
</tr>
<tr>
<td>Spacer Weight</td>
<td>N/A</td>
</tr>
</tbody>
</table>

\[^{[1]}\] Includes the connectors
\[^{[2]}\] ±1 gms Tolerance

NOTES:
1. PACKAGE, LEADS, COVER MATERIAL: KOWAR™
2. BRACKET MATERIAL: ALUMINUM
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES ±0.005 [0.13] UNLESS OTHERWISE SPECIFIED.
6. FIELD REPLACEABLE SMA CONNECTORS.

TENSOLITE 5602 - SCSF OR EQUIVALENT.

TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0-80 HARDWARE WITH DESIRED MOUNTING SCREWS.

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