MMA710
DC to 4 GHz Amplifier

Description:
The MMA710 is a fully matched amplifier fabricated in Aeroflex/Metelics reliable InGap HBT technology. The economical SOT89 package provides excellent wide-band performance.

Features:
- DC - 4 GHz Broadband Gain Block
- ± 0.5 dB Typical Gain Flatness
- 50 Ohms Input/Output Impedances

RF Specifications:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Term</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3dB Bandwidth</td>
<td>BW</td>
<td>DC</td>
<td>- - -</td>
<td>4</td>
<td>GHz</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>f₀</td>
<td>DC</td>
<td>- - -</td>
<td>4</td>
<td>GHz</td>
</tr>
<tr>
<td>Gain</td>
<td>Gᵣ</td>
<td>12</td>
<td>13</td>
<td>- - -</td>
<td>dB</td>
</tr>
<tr>
<td>Output Power</td>
<td>P₁dB</td>
<td>+18</td>
<td>+20</td>
<td>- - -</td>
<td>dBm</td>
</tr>
<tr>
<td>Input Standing Wave Ratio</td>
<td>VSWR</td>
<td>- - -</td>
<td>1.5:1</td>
<td>2.0:1</td>
<td>- - -</td>
</tr>
<tr>
<td>Output Standing Wave Ratio</td>
<td>VSWR</td>
<td>- - -</td>
<td>2.0:1</td>
<td>3.6:1</td>
<td>- - -</td>
</tr>
<tr>
<td>3rd Order Intercept Point</td>
<td>IP₃</td>
<td>+34</td>
<td>+37</td>
<td>- - -</td>
<td>dBm</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>NF</td>
<td>- - -</td>
<td>5.0</td>
<td>6.0</td>
<td>dB</td>
</tr>
<tr>
<td>Device Current</td>
<td>Iᵢₗ</td>
<td>85</td>
<td>95</td>
<td>110</td>
<td>mA</td>
</tr>
</tbody>
</table>

NOTES:
1. Iᵢₗ = +25 °C.
2. Vₛ = 8.0 Vdc, Rₛₛₛ = 11 Ω
3. IP₃ measured with two tones offset 10 MHz at 0 dBm per tone.

Absolute Maximum Ratings:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Current (Iᵢₗ)</td>
<td>150 mA</td>
</tr>
<tr>
<td>RF Input Power, continuous</td>
<td>+13 dBm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40 to +85 °C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55 to +125 °C</td>
</tr>
<tr>
<td>Thermal Resistance (θᵢₗ)</td>
<td>70 °C/W</td>
</tr>
</tbody>
</table>

Revision Date: 11/04/04
Typical RF Performance:

Figure 1. Gain vs Frequency

Figure 2. Output Power vs Frequency

Figure 3. Input VSWR vs Frequency

Figure 4. Output VSWR vs Frequency

Figure 5. OIP3 vs Frequency

Figure 6. Noise Figure vs Frequency

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Aeroflex / Metelics, Inc.
www.aeroflex-metelics.com

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SOT89 Outline Dimensions:

Recommended PCB Layout:
Application Circuit:

\[
\begin{align*}
V_s &= 8.0 \text{ Vdc min.} \\
C_5 &= 0.1 \text{ uF} \\
C_4 &= 100 \text{ pF} \\
C_3 &= 10 \text{ pF} \\
C_1, C_2, L_1: \quad X_L &>> 50\Omega, X_C << 50\Omega \\
R_{\text{BIAS}} &\text{ vs. } V_s \\
\begin{array}{|c|c|c|c|c|}
\hline
V_s (V) & 8.0 & 10.0 & 12.0 & 15.0 \\
R_{\text{BIAS}} (\Omega) & 11 & 30 & 51 & 86 \\
\text{Power Dissipation (W)} & 0.1 & 0.3 & 0.5 & 0.8 \\
\hline
\end{array}
\end{align*}
\]