**MEC25XDRA**

**X-Band 0.5 Watt Power Amplifier**

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**Main Features**

- 0.25µm GaAs pHEMT Technology
- 8.9–11.0 GHz full performance Frequency Range
- Small Signal Gain > 21 dB
- Input Output RL > 12 dB
- P1dB > 27 dBm

- Bias: Vd = 6V, Id = 190mA, Vg = -0.5 V (Typ.)

- Chip Size: 1.98 x 1.80 x 0.07 mm³

**Typical Applications**

- Radar
- Point-to-Point Radio
- X Band Driver

**Measured Data**

*Image of graph showing linear gain, return losses vs. frequency*
Main Characteristics

Test Conditions: $T_{\text{base\_plate}} = 25^\circ\text{C}$, $V_d = 6\ \text{V}$, $I_{\text{dq}} = 190\ \text{mA}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>8.9</td>
<td></td>
<td>11.0</td>
<td>GHz</td>
</tr>
<tr>
<td>Small Signal Gain</td>
<td>21</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td></td>
<td>-15</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td></td>
<td>-12</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Output Power at 1 dB of Gain Compression</td>
<td>27</td>
<td></td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Drain Supply Voltage</td>
<td>6</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Supply Quiescent Drain Current</td>
<td>190</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>PAE</td>
<td>40</td>
<td></td>
<td></td>
<td>%</td>
</tr>
</tbody>
</table>
MEC25XDRA - Selected Measurements

Test Conditions: \( T_{\text{base plate}} = 25^\circ \text{C} \), \( V_d = 6 \text{ V} \), \( I_{\text{dq}} = 190 \text{ mA} \)

![Graph showing linear gain, return losses vs. frequency and input power vs. gain](image)

Test Conditions: \( T_{\text{base plate}} = 25^\circ \text{C} \), \( V_d = 6 \text{ V} \), \( I_{\text{dq}} = 190 \text{ mA} \) - Input Power = 7 dBm

![Graph showing output power, gain vs. frequency and PAE, drain current vs. frequency](image)
Bond Pad Configuration & Assembly Recommendations

<table>
<thead>
<tr>
<th>Bond Pad #</th>
<th>Connection</th>
<th>External Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN and OUT</td>
<td>2 Bonding Wires</td>
<td>L_{bond} = 0.3nH</td>
</tr>
<tr>
<td>1, 3 Vg</td>
<td>L_{bond} ≤ 1 nH</td>
<td>C_{1} = 100pF/10V</td>
</tr>
<tr>
<td>2, 4, Vd</td>
<td>L_{bond} ≤ 1nH</td>
<td>C_{1} = 100pF/50V</td>
</tr>
</tbody>
</table>

Eutectic Die bond using AuSn (80/20) solder is recommended.

The backside of the die is the Source (ground) contact.

Thermosonic ball or wedge bonding are the preferred connection methods.

Gold wire must be used for connections.

Bias Procedure

**Bias-Up**

1. Vg set to -1.5 V.
2. Vd set to +6 V.
3. Adjust Vg until quiescent Id is 190 mA (Vg = -0.5 V Typical).
4. Apply RF signal.

**Bias-Down**

1. Turn off RF signal.
2. Reduce Vg to -1.5 V (Id0 ≈ 0 mA).
3. Set Vd to 0 V.
4. Turn off Vd.
5. Turn off Vg.
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Notice

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