FEATURES

- BROAD BAND INTERNALLY MATCHED HEMT
- HIGH POWER
  Pout = 47.0dBm at Pin = 42.0dBm
- HIGH GAIN
  GL = 8.0dB at 12.7GHz to 13.2GHz
- LOW INTERMODULATION DISTORTION
  IM3(Min.) = -25dBc at Pout = 40.0dBm (Single Carrier Level)
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>SYMBOL</th>
<th>CONDITIONS</th>
<th>UNIT</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>Pout</td>
<td>VDS= 24V, IDSset= 2.0A, f = 12.7 to 13.2GHz, @Pin = 42dBm</td>
<td>dBm</td>
<td>46.0</td>
<td>47.0</td>
<td>—</td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS1</td>
<td></td>
<td>A</td>
<td>—</td>
<td>5.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Power Added Efficiency</td>
<td>PAE</td>
<td></td>
<td>%</td>
<td>—</td>
<td>29</td>
<td>—</td>
</tr>
<tr>
<td>Linear Gain</td>
<td>GL</td>
<td>@Pin = 20dBm</td>
<td>dB</td>
<td>7.0</td>
<td>8.0</td>
<td>—</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>△G</td>
<td></td>
<td>dB</td>
<td>—</td>
<td>—</td>
<td>±0.8</td>
</tr>
<tr>
<td>3rd Order Intermodulation Distortion</td>
<td>IM3</td>
<td>Two-tone Test</td>
<td>Po = 40.0dBm (Single Carrier Level), ∆f= 5MHz (IM3), ∆f= 150MHz (IM3-2)</td>
<td>dBc</td>
<td>-25</td>
<td>-27</td>
</tr>
<tr>
<td></td>
<td>IM3-2</td>
<td></td>
<td>dBc</td>
<td>-25</td>
<td>-27</td>
<td>—</td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS2</td>
<td></td>
<td>A</td>
<td>—</td>
<td>3.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Channel Temperature Rise</td>
<td>△Tch</td>
<td>(VDS X IDS + Pin – Pout) X Rth(c-c)</td>
<td>°C</td>
<td>—</td>
<td>130</td>
<td>160</td>
</tr>
</tbody>
</table>

Recommended Gate Resistance (Rg): 13.3 Ω

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>SYMBOL</th>
<th>CONDITIONS</th>
<th>UNIT</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transconductance</td>
<td>gm</td>
<td>VDS= 5V, IDS= 5.0A</td>
<td>S</td>
<td>4.5</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Pinch-off Voltage</td>
<td>VGSoff</td>
<td>VDS= 5V, IDS= 23mA</td>
<td>V</td>
<td>-1.0</td>
<td>-4.0</td>
<td>-6.0</td>
</tr>
<tr>
<td>Saturated Drain Current</td>
<td>IDSS</td>
<td>VDS= 5V, VGS= 0V</td>
<td>A</td>
<td>—</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td>Gate-Source Breakdown Voltage</td>
<td>VGSO</td>
<td>IGS= -10mA</td>
<td>V</td>
<td>-10</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>Rth(c-c)</td>
<td>Channel to Case</td>
<td>°C/W</td>
<td>1.4</td>
<td>1.6</td>
<td>—</td>
</tr>
</tbody>
</table>

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### ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>SYMBOL</th>
<th>UNIT</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Voltage</td>
<td>VDS</td>
<td>V</td>
<td>50</td>
</tr>
<tr>
<td>Gate-Source Voltage</td>
<td>VGS</td>
<td>V</td>
<td>-10</td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS</td>
<td>A</td>
<td>15.0</td>
</tr>
<tr>
<td>Total Power Dissipation (Tc=25°C)</td>
<td>PT</td>
<td>W</td>
<td>140</td>
</tr>
<tr>
<td>Channel Temperature</td>
<td>Tch</td>
<td>°C</td>
<td>250</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>°C</td>
<td>-65 to +175</td>
</tr>
</tbody>
</table>

### PACKAGE OUTLINE (7-AA07A)

![Package Diagram](image)

**Unit in mm**
- ① Gate
- ② Source
- ③ Drain

### HANDLING PRECAUTIONS FOR PACKAGE MODEL

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C or 3 seconds at 350°C.
Pout, Gain, PAE, IDS vs. Pin

VDS = 24 V, IDS\textsubscript{set} = 2.0 A, f = 12.7, 12.95, 13.2 GHz, Ta = +25 °C

- **Pout vs Pin**
  - VDS = 24 V, IDS\textsubscript{set} = 2.0 A
  - f = 12.7, 12.95, 13.2 GHz

- **Gain vs Pin**
  - VDS = 24 V, IDS\textsubscript{set} = 2.0 A
  - f = 12.7, 12.95, 13.2 GHz

- **PAE vs Pin**
  - VDS = 24 V, IDS\textsubscript{set} = 2.0 A
  - f = 12.7, 12.95, 13.2 GHz

- **IDS vs Pin**
  - VDS = 24 V, IDS\textsubscript{set} = 2.0 A
  - f = 12.7, 12.95, 13.2 GHz
- IM3, IM5 vs. Pout

VDS = 24 V, IDSset = 2.0 A, f = 12.7, 12.95, 13.2 GHz, Δf = 5 MHz, Ta = +25 °C

- IM3-2, IM5-2 vs. Pout

VDS = 24 V, IDSset = 2.0 A, f = 12.7, 12.95, 13.2 GHz, Δf = 150 MHz, Ta = +25 °C
- Pout, Gain, PAE, IDS vs. Pin vs. IDSset

VDS = 24 V, IDSset = 1.0, 2.0, 3.0 A, f = 12.95 GHz, Ta = +25 °C

Pout vs Pin
VDS = 24 V, f = 12.95 GHz

Gain vs Pin
VDS = 24 V, f = 12.95 GHz

PAE vs Pin
VDS = 24 V, f = 12.95 GHz

IDS vs Pin
VDS = 24 V, f = 12.95 GHz
**IM3, IM5 vs. Pout vs. IDS\text{set}**

VDS = 24 V, IDS\text{set} = 1.0, 2.0, 3.0 A, f = 12.95 GHz, \( \Delta f \) = 5 MHz, Ta = +25 \( ^\circ \)C

**Pout vs. Frequency**

VDS = 24 V, IDS = 2.0 A, Ta = +25 \( ^\circ \)C
Pout, Gain, PAE, IDS vs. Pin vs. Temperature

VDS = 24 V, IDSset = 2.0 A, f = 12.95 GHz, Ta = -25, +25, +75 °C
- S-Parameters

VDS = 24 V, IDSset = 2.0 A, f = 10.0 to 15.0 GHz, Ta = +25 °C
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