FEATURES

- **BROAD BAND INTERNALLY MATCHED HEMT**
- **HIGH POWER**
  
  \[ P_{\text{out}} = 47.0 \text{dBm} \]
  
  \[ \text{at } P_{\text{in}} = 39.0 \text{dBm} \]
- **HIGH GAIN**
  
  \[ G = 13.5 \text{dB} \]
  
  \[ \text{at } 5.85 \text{GHz to 6.75GHz} \]
- **LOW INTERMODULATION DISTORTION**
  
  \[ \text{IM}_{3}(\text{Min.}) = -40 \text{dBc} \]
  
  \[ \text{at } P_{\text{o}} = 32.0 \text{dBm} \]
  
  \[ \text{Single Carrier Level} \]
- **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= 3.0A, f= 5.85 to 6.75GHz @Pin= 39dBm</td>
<td>dBm</td>
<td>46.0</td>
<td>47.0</td>
<td></td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS1</td>
<td>@Pin= 20dBm</td>
<td>A</td>
<td>5.4</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Power Added Efficiency</td>
<td>(\eta_{\text{add}})</td>
<td></td>
<td>%</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear Gain</td>
<td>GL</td>
<td>@Pin= 20dBm</td>
<td>dB</td>
<td>12.5</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>Gain flatness</td>
<td>(\Delta 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, Po= 32.0dBm, (\Delta f= 5\text{MHz}) (Single Carrier Level)</td>
<td>dBc</td>
<td>-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS2</td>
<td></td>
<td>A</td>
<td>3.5</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>Channel Temperature Rise</td>
<td>(\Delta T_{\text{ch}})</td>
<td>((\text{VDS} \times \text{IDS} + \text{Pin} – \text{Pout}) \times R_{\text{th(c-c)}})</td>
<td>°C</td>
<td>130</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

Recommended Gate Resistance(Rg): 60 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>(g_{m})</td>
<td>VDS= 5V, IDS= 5.0A</td>
<td>S</td>
<td></td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>Pinch-off Voltage</td>
<td>VGSoff</td>
<td>VDS= 5V, IDS= 23mA</td>
<td>V</td>
<td>-2.6</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>15</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></td>
<td>1.4</td>
<td>1.6</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</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-AA04A)

![Package Outline 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, IDSset = 3.0 A, f = 5.85, 6.3, 6.75 GHz, Ta = +25 °C
- **IM3, IM5 vs. Pout**

  VDS = 24 V, IDSset = 3.0 A, f = 5.85, 6.3, 6.75 GHz, Δf = 5 MHz, Ta = +25 °C

- **Pout vs. Frequency**

  VDS = 24 V, IDSset = 3.0 A, Ta = +25 °C
Pout, Gain, PAE, IDS vs. Pin vs. IDSset

VDS = 24 V, IDSset = 2.0, 3.0, 4.0 A, f = 6.3 GHz, Ta = +25 °C
- IM3, IM5 vs. Pout vs. IDSset

VDS = 24 V, IDSset = 2.0, 3.0, 4.0 A, f = 6.3 GHz, Δf = 5 MHz, Ta = +25 °C

![Graph of IM3 vs Pout](image)

![Graph of IM5 vs Pout](image)
· Pout, Gain, PAE, IDS vs. Pin vs. Temperature

VDS = 24 V, IDSset = 3.0 A, f = 6.3 GHz, Ta = -25, +25, +75 °C

Pout vs Pin
VDS=24V, IDset=3.0A, f=6.3GHz

Gain vs Pin
VDS=24V, IDset=3.0A, f=6.3GHz

PAE vs Pin
VDS=24V, IDset=3.0A, f=6.3GHz

IDS vs Pin
VDS=24V, IDset=3.0A, f=6.3GHz
- S-Parameters

\[ V_D = 24 \text{ V}, \quad I_D = 3.0 \text{ A}, \quad f = 4.0 \text{ to } 9.0 \text{ GHz}, \quad T_a = +25 \degree \text{C} \]
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