FEATURES

- **BROAD BAND INTERNALLY MATCHED HEMT**
- **HIGH POWER**
  
  \[ P_{\text{out}} = 51.0 \text{dBm} \text{ at Pin} = 43.0 \text{dBm} \]
- **HIGH GAIN**
  
  \[ G_L = 13.5 \text{dB} \text{ at Pin} = 20.0 \text{dBm} \]
- **LOW INTERMODULATION DISTORTION**
  
  \[ \text{IM3(Min.)} = -25 \text{dBc} \text{ at } P_{\text{out}} = 44.0 \text{dBm} \]
  
  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, f = 5.9 to 6.4GHz IDSS= 4.0A @Pin= 43dBm</td>
<td>dBm</td>
<td>50.0</td>
<td>51.0</td>
<td>—</td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS1</td>
<td></td>
<td>A</td>
<td>—</td>
<td>10.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Power Added Efficiency</td>
<td>( \eta_{\text{add}} )</td>
<td></td>
<td>%</td>
<td>—</td>
<td>44</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>( \pm 0.8 )</td>
</tr>
<tr>
<td>3rd Order Intermodulation Distortion</td>
<td>IM3</td>
<td>Two-Tone Test Po= 44.0dBm, ( \Delta f = 5\text{MHz} ) (Single Carrier Level)</td>
<td>dBc</td>
<td>-25</td>
<td>-30</td>
<td>—</td>
</tr>
<tr>
<td>Drain Current</td>
<td>IDS2</td>
<td></td>
<td>A</td>
<td>—</td>
<td>—</td>
<td>8.0</td>
</tr>
<tr>
<td>Channel Temperature Rise</td>
<td>( \Delta T_{\text{ch}} )</td>
<td>(VDS X IDS + Pin – Pout) X Rth(c-c)</td>
<td>°C</td>
<td>—</td>
<td>120</td>
<td>140</td>
</tr>
</tbody>
</table>

Recommended Gate Resistance(Rg): 28 \( \Omega \)

### 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, ( IG_S = 10.0A )</td>
<td>S</td>
<td>—</td>
<td>8.0</td>
<td>—</td>
</tr>
<tr>
<td>Pinch-off Voltage</td>
<td>VGSoff</td>
<td>VDS= 5V, ( ID_S = 46mA )</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, ( VG_S = 0V )</td>
<td>A</td>
<td>—</td>
<td>28</td>
<td>—</td>
</tr>
<tr>
<td>Gate-Source Breakdown Voltage</td>
<td>VGSO</td>
<td>( IS_S = -20mA )</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>0.6</td>
<td>0.8</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>18</td>
</tr>
<tr>
<td>Total Power Dissipation (Tc= 25°C)</td>
<td>PT</td>
<td>W</td>
<td>280</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-AA06A)

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**

  \[ \text{VDS} = 24 \text{ V}, \ \text{IDS}_{\text{set}} = 4.0 \text{ A, } f = 5.9, 6.15, 6.4 \text{ GHz, } T_a = 25 \degree \text{C} \]

![Pout vs Pin Graph](image1)

![Gain vs Pin Graph](image2)

![PAE vs Pin Graph](image3)

![IDS vs Pin Graph](image4)
- IM3, IM5 vs. Pout

\[ V_{DS} = 24 \text{ V}, \ \text{IDS}_{\text{set}} = 4.0 \text{ A}, \ f = 5.9, 6.15, 6.4 \text{ GHz}, \ \Delta f = 5 \text{ MHz}, \ T_a = +25 \ ^\circ \text{C} \]

- Pout vs. Frequency

\[ V_{DS} = 24 \text{ V}, \ \text{IDS} = 4.0 \text{ A}, \ f = 5.6, 5.8, 6.0, 6.2, 6.4, 6.6, 6.8, 7.0 \text{ GHz} \]
**Pout, Gain, PAE, IDS vs. Pin vs. IDS\text{set}**

\[ \text{VDS} = 24 \text{ V}, \text{ IDS\text{set}} = 2.0, 4.0, 6.0 \text{ A}, f = 6.15 \text{ GHz}, T_a = +25 \text{ °C} \]

- **Pout vs Pin**
  - VDS=24V, f=6.15GHz

- **Gain vs Pin**
  - VDS=24V, f=6.15GHz

- **PAE vs Pin**
  - VDS=24V, f=6.15GHz

- **IDS vs Pin**
  - VDS=24V, f=6.15GHz
IM3, IM5 vs. Pout vs. IDS\text{set}

\text{VDS} = 24 \text{ V}, \text{IDS\text{set}} = 2.0, 4.0, 6.0 \text{ A}, f = 6.15 \text{ GHz}, \Delta f = 5 \text{ MHz}, T_a = +25 ^\circ \text{C}
- Pout, Gain, PAE, IDS vs. Pin vs. Temperature

VDS = 24 V, IDset = 4.0 A, f = 6.15 GHz, Ta = -25°C, +25°C, +75°C

- Pout vs Pin

VDS=24V, IDset=4.0A, f=6.15GHz

- Gain vs Pin

VDS=24V, IDset=4.0A, f=6.15GHz

- PAE vs Pin

VDS=24V, IDset=4.0A, f=6.15GHz

- IDS vs Pin

VDS=24V, IDset=4.0A, f=6.15GHz
- **S-Parameters**

\[
V_{DS} = 24 \, V, \quad I_{DS\text{set}} = 4.0 \, A, \quad f = 4.0 \, \text{ to } 8.0 \, \text{GHz}, \quad T_a = +25 \, ^{\circ}C
\]

\[Z_0 = 50 \, \Omega\]

![Diagram of S-Parameters](image-url)

\[
\begin{align*}
S_{11} \\
S_{22}
\end{align*}
\]

\[\text{S11, S22} \quad \text{VDS=24V, IDS=4.0A}\]

\[
\begin{align*}
S_{21}, S_{12} \\
\text{S21, S12} \quad \text{VDS=24V, IDS=4.0A}
\end{align*}
\]
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