< High-power GaAs FET (small signal gain stage) >

MGF2407A

S to Ku BAND / 0.28W
non - matched

DESCRIPTION
The MGF2407A, power GaAs FET with an N-channel schottky gate, is designed for use in S to Ku band amplifiers.

FEATURES
- High output power
  \( P_o = 24.5 \text{dBm} \) (TYP.) @f=14.5GHz
- High linear power gain
  \( \text{GLP} = 8.0 \text{dB} \) (TYP.) @f=14.5GHz
- High power added efficiency
  \( \text{P.A.E.} = 30\% \) (TYP.) @f=14.5GHz,P1dB

APPLICATION
- S to Ku Band power amplifiers

QUALITY
- IG

RECOMMENDED BIAS CONDITIONS
- Vds=10V  
- \( I_{ds} = 75 \text{mA} \)  Refer to Bias Procedure

**Absolute maximum ratings \((Ta=25^\circ C)\)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGDO</td>
<td>Gate to drain voltage</td>
<td>-15</td>
<td>V</td>
</tr>
<tr>
<td>VGSO</td>
<td>Gate to source voltage</td>
<td>-15</td>
<td>V</td>
</tr>
<tr>
<td>ID</td>
<td>Drain current</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>IGR</td>
<td>Reverse gate current</td>
<td>-0.6</td>
<td>mA</td>
</tr>
<tr>
<td>IGF</td>
<td>Forward gate current</td>
<td>2.5</td>
<td>mA</td>
</tr>
<tr>
<td>PT*1</td>
<td>Total power dissipation</td>
<td>1.5</td>
<td>W</td>
</tr>
<tr>
<td>Tch</td>
<td>Cannel temperature</td>
<td>175</td>
<td>(^\circ)C</td>
</tr>
<tr>
<td>Tstg</td>
<td>Storage temperature</td>
<td>-65 to +175</td>
<td>(^\circ)C</td>
</tr>
</tbody>
</table>

*1:Tc=25\(^\circ\)C

**Electrical characteristics \((Ta=25^\circ C)\)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test conditions</th>
<th>Limits (Min.</th>
<th>Typ.</th>
<th>Max.)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDSS</td>
<td>Saturated drain current</td>
<td>VDS=3V,VGS=0V</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>gm</td>
<td>Transconductance</td>
<td>VDS=3V,ID=0.5mA</td>
<td>50</td>
<td>65</td>
<td>-</td>
<td>mS</td>
</tr>
<tr>
<td>VGS(off)</td>
<td>Gate to source cut-off voltage</td>
<td>VDS=3V,ID=75mA</td>
<td>-1</td>
<td>-2.5</td>
<td>-4</td>
<td>V</td>
</tr>
<tr>
<td>P1dB</td>
<td>Output power</td>
<td>VDS=10V,ID(RF off)=75mA</td>
<td>23</td>
<td>24.5</td>
<td>-</td>
<td>dBm</td>
</tr>
<tr>
<td>GLP</td>
<td>Linear power gain</td>
<td>f=14.5GHz</td>
<td>7</td>
<td>8</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>P.A.E.</td>
<td>Power added efficiency</td>
<td></td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>%</td>
</tr>
<tr>
<td>R(\iota)(\text{ch-c}) *2</td>
<td>Thermal resistance (\Delta Vf) method</td>
<td></td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>(^\circ)C/W</td>
</tr>
</tbody>
</table>

*2 :Channel-case

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MGF2407A TYPICAL CHARACTERISTICS (Ta=25deg.C)

**MGF2407A S-parameters (Ta=25deg.C, VDS=10(V), IDS=75(mA))**

<table>
<thead>
<tr>
<th>f (GHz)</th>
<th>S11</th>
<th>S21</th>
<th>S12</th>
<th>S22</th>
<th>K</th>
<th>MSG/MAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Magn.</td>
<td>Angle(deg.)</td>
<td>Magn.</td>
<td>Angle(deg.)</td>
<td>Magn.</td>
<td>Angle(deg.)</td>
</tr>
<tr>
<td>4</td>
<td>0.968</td>
<td>-112.5</td>
<td>1.766</td>
<td>81.5</td>
<td>0.024</td>
<td>-6.0</td>
</tr>
<tr>
<td>6</td>
<td>0.929</td>
<td>-135.5</td>
<td>1.279</td>
<td>48.5</td>
<td>0.028</td>
<td>-6.0</td>
</tr>
<tr>
<td>8</td>
<td>0.891</td>
<td>-157.5</td>
<td>1.147</td>
<td>26.0</td>
<td>0.033</td>
<td>-17.0</td>
</tr>
<tr>
<td>10</td>
<td>0.833</td>
<td>-180.0</td>
<td>1.111</td>
<td>-5.0</td>
<td>0.041</td>
<td>-30.5</td>
</tr>
<tr>
<td>12</td>
<td>0.719</td>
<td>158.0</td>
<td>1.080</td>
<td>-36.0</td>
<td>0.050</td>
<td>-50.0</td>
</tr>
<tr>
<td>14</td>
<td>0.469</td>
<td>133.5</td>
<td>1.030</td>
<td>-85.0</td>
<td>0.059</td>
<td>-82.0</td>
</tr>
<tr>
<td>16</td>
<td>0.172</td>
<td>-165.5</td>
<td>0.967</td>
<td>-153.0</td>
<td>0.073</td>
<td>-123.0</td>
</tr>
</tbody>
</table>
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