GENERAL DESCRIPTION

The 0912GN-300V is an internally matched, COMMON SOURCE, class AB GaN on SiC HEMT transistor capable of providing over 19dB gain, 300 Watts of pulsed RF output power at 128us pulse width, 10% duty factor across the 960 to 1215 MHz band. The transistor has internal pre-match for optimal performance. This hermetically sealed transistor is designed for avionic applications. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

CASE OUTLINE

55-KR
Common Source

ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power Dissipation</td>
<td>650 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Device Dissipation @ 25°C</td>
<td>18</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain-Source Voltage (V_DSS)</td>
<td>150 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gate-Source Voltage (V_CS)</td>
<td>-8 to +0 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature (T_STG)</td>
<td>-55 to +125°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Junction Temperature</td>
<td>+250°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ELECTRICAL CHARACTERISTICS @ 25°C

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristics</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pout</td>
<td>Output Power</td>
<td>Pout=300W, Freq=960, 1090, 1215 MHz</td>
<td>300</td>
<td></td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>Gp</td>
<td>Power Gain</td>
<td>Pout=300W, Freq=960, 1090, 1215 MHz</td>
<td>18</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ηd</td>
<td>Drain Efficiency</td>
<td>Pout=300W, Freq=960, 1090, 1215 MHz</td>
<td>52</td>
<td>60</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Dr</td>
<td>Droop</td>
<td>Pout=300W, Freq=960, 1090, 1215 MHz</td>
<td>.8</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VSWR-T</td>
<td>Load Mismatch Tolerance</td>
<td>Pout=300W, Freq=1215 MHz</td>
<td>3:1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>θjc</td>
<td>Thermal Resistance</td>
<td>Pulse Width=128us, Duty=10%</td>
<td>.28</td>
<td>°C/W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Bias Condition: Vdd=+50V, Idq=60mA average current (Vgs= -2.0 ~ -4.5V ) with constant gate Bias

FUNCTIONAL CHARACTERISTICS @ 25°C

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristics</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_D(Off)</td>
<td>Drain leakage current</td>
<td>Vgs = -8V, V_D = 150V</td>
<td>14</td>
<td>mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_G(Off)</td>
<td>Gate leakage current</td>
<td>Vgs = -8V, V_D = 0V</td>
<td>6</td>
<td>mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BV_DSS</td>
<td>Drain-source breakdown voltage</td>
<td>Vgs =-8V, I_D = 14mA</td>
<td>150</td>
<td>V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Export Classification: EAR 99

Issue June 2013

For the most current data, consult MICROSEMI’s website: www.MICROSEMI.com
Specifications are subject to change, consult the RFIS factory at (408) 986-8031 for the latest information
0912GN-300V
300 Watts - 50 Volts, 128uS, 10%
Broad Band 960 - 1215 MHz

Typical Performance Data

<table>
<thead>
<tr>
<th>Freq (GHz)</th>
<th>Pin (W)</th>
<th>Pout (W)</th>
<th>Id (A)</th>
<th>RL (dB)</th>
<th>Eff (%)</th>
<th>Gp (dB)</th>
<th>Droop (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.960</td>
<td>4</td>
<td>338</td>
<td>1.15</td>
<td>-7.5</td>
<td>60</td>
<td>19.3</td>
<td>.4</td>
</tr>
<tr>
<td>1.090</td>
<td>4</td>
<td>335</td>
<td>1.09</td>
<td>-8.2</td>
<td>63</td>
<td>19.2</td>
<td>.3</td>
</tr>
<tr>
<td>1.215</td>
<td>4</td>
<td>310</td>
<td>1.08</td>
<td>-17.5</td>
<td>58</td>
<td>18.9</td>
<td>.3</td>
</tr>
</tbody>
</table>

Model 0912GN-300V
Vdd = 50V, 128uS, 10%

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Transistor Impedance Information

Note: $Z_{Source}$ is looking into the input circuit; $Z_{Load}$ is looking into the output circuit.

<table>
<thead>
<tr>
<th>Freq (GHz)</th>
<th>$Z_s$</th>
<th>$Z_l$</th>
</tr>
</thead>
<tbody>
<tr>
<td>.960</td>
<td>2.15 – j0.85</td>
<td>2.40 + j0.75</td>
</tr>
<tr>
<td>1.090</td>
<td>2.10 + j0.55</td>
<td>2.35 + j1.40</td>
</tr>
<tr>
<td>1.215</td>
<td>2.15 + j0.17</td>
<td>1.95 + j2.20</td>
</tr>
</tbody>
</table>

Please contact our representative for the RF test circuit
0912GN-300V
300 Watts - 50 Volts, 128uS, 10%
Broad Band 960 - 1215 MHz

55-KR PACKAGE DIMENSION

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Min (mil)</th>
<th>Min (mm)</th>
<th>Max (mil)</th>
<th>Max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>370</td>
<td>9.40</td>
<td>372</td>
<td>9.44</td>
</tr>
<tr>
<td>B</td>
<td>498</td>
<td>12.65</td>
<td>500</td>
<td>12.7</td>
</tr>
<tr>
<td>C</td>
<td>700</td>
<td>17.78</td>
<td>702</td>
<td>17.83</td>
</tr>
<tr>
<td>D</td>
<td>830</td>
<td>21.08</td>
<td>832</td>
<td>21.13</td>
</tr>
<tr>
<td>E</td>
<td>1030</td>
<td>26.16</td>
<td>1032</td>
<td>26.21</td>
</tr>
<tr>
<td>F</td>
<td>101</td>
<td>2.56</td>
<td>102</td>
<td>2.59</td>
</tr>
<tr>
<td>G</td>
<td>151</td>
<td>3.84</td>
<td>152</td>
<td>3.86</td>
</tr>
<tr>
<td>H</td>
<td>385</td>
<td>9.78</td>
<td>387</td>
<td>9.83</td>
</tr>
<tr>
<td>I</td>
<td>130</td>
<td>3.30</td>
<td>132</td>
<td>3.35</td>
</tr>
<tr>
<td>J</td>
<td>003</td>
<td>.076</td>
<td>004</td>
<td>0.10</td>
</tr>
<tr>
<td>K</td>
<td>135</td>
<td>3.43</td>
<td>137</td>
<td>3.48</td>
</tr>
<tr>
<td>L</td>
<td>105</td>
<td>2.67</td>
<td>107</td>
<td>2.72</td>
</tr>
<tr>
<td>M</td>
<td>085</td>
<td>2.16</td>
<td>86</td>
<td>2.18</td>
</tr>
<tr>
<td>N</td>
<td>065</td>
<td>1.65</td>
<td>66</td>
<td>1.68</td>
</tr>
</tbody>
</table>

1 = Gate
2 = Source
3 = Drain

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Revision History

<table>
<thead>
<tr>
<th>Revision Level / Date</th>
<th>Para. Affected</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 / 20 June 2013</td>
<td>-</td>
<td>Initial Preliminary</td>
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