GaN Power Transistor
BNH0445F

Product Features and Applications

The BNH0445F is a gallium-nitride high-electron mobility transistor (GaN HEMT) for 28 V drain supply voltage. It comes unmatched in a metal-ceramics flange package and it is suitable for power amplifiers in communication and radar, including broadband applications.

- Output Power > 20 W
  $P_{\text{1dB}} = 43 \text{ dBm (typ.)} @ 2 \text{ GHz}$
- Power Added Efficiency (PAE) 60% @ 28 V
- High Power Amplifiers
- Radar Systems
- RF Sub-Systems

Absolute Maximum Ratings (not simultaneous)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Min</th>
<th>Typ.</th>
<th>Max</th>
<th>Units</th>
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</thead>
</table>
| $I_{\text{DSS}}$           | Drain Saturation Current *  
(@ $V_{\text{GS}}=+1\text{V}$; $V_{\text{DS}}=+10\text{V}$) | 7   |      |     | A     |
| $V_{\text{Br}}$            | Breakdown Voltage | >100 |      |     | V     |
| $V_{\text{P}}$             | Threshold Voltage | -3.5 | -2.25 | -1.7 | V     |
| $V_{\text{GS(Q)}}$         | Gate Quiescent Voltage  
@ $V_{\text{DS}} = 28 \text{V}$, $I_{\text{Q}} = 0.5 \text{A}$ | -1.8 |      |     | V     |

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<tbody>
<tr>
<td>$f$</td>
<td>Frequency (GHz)</td>
<td>0.9</td>
<td>1.8</td>
<td>2.14</td>
<td>2.64</td>
</tr>
<tr>
<td>$G_T$</td>
<td>Small Signal Gain (dB)</td>
<td>21</td>
<td>18</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>$P_{\text{1dB}}$</td>
<td>1 dB Comp. Point (W)</td>
<td>20</td>
<td></td>
<td></td>
<td>TBD</td>
</tr>
<tr>
<td>$P_{\text{SAT}}$</td>
<td>Output Power (W)</td>
<td>25</td>
<td></td>
<td></td>
<td>TBD</td>
</tr>
<tr>
<td>PAE</td>
<td>Power Added Efficiency (2 GHz)</td>
<td>&gt;50% @ $P_{\text{SAT}}$ (&gt;60% matched for optimum PAE)</td>
<td></td>
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</table>

DC Characteristics and RF Specifications (Load Pull)

* measured on 100 μm wide process control monitor transistors, scaled to device size
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BNH0445F

RF Measurements

Power Performance
(V_{DS} = 28 V, f = 2 GHz)

Typical load and source impedances for optimum PAE:

\[ \Gamma_{source} \quad Re = -0.95 \quad Im = -0.18 \]
\[ \Gamma_{load} \quad Re = -0.84 \quad Im = +0.02 \]

BeMiTec Test Board and Package Dimensions

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