

GaN Power Transistor

BNH0445FG

Product Features

- GaN HFET, gate length 0.5 μm
Gate width: 10 mm
- Output Power > 20 W
 $P_{-1\text{dB}} = 43 \text{ dBm (typ.) @ 2 GHz}$
- Drain Efficiency:
56% @ 28 V, 65% @ 15 V
- High Power Gain
 $G = 17 \text{ dB @ 2 GHz}$

Applications

- High Power amplifiers
- Radar-Systems
- RF-Sub-Systems



DC ratings (measured on 100 μm wide PCM transistors)

Symbol	Parameter	Min	Typ.	Max	Units
I_{DSS}	Drain Saturation Current (@ $V_{\text{GS}}=+2\text{V}$; $V_{\text{DS}}=+15\text{V}$)	910	960	990	mA/mm
V_{Br}	Breakdown Voltage (@ $2 \times 125 \mu\text{m}$; $L_{\text{GD}}=6\mu\text{m}$)		> 70		V
V_{P}	Pinch-off Voltage	-2.1	-2.0	-1.8	V
g_{m}	max. Transconductance (@ $V_{\text{DS}}=+15\text{V}$)	270	290	310	mS/mm
I_{leak}	Gate Leakage (@ $V_{\text{DS}}=+15\text{V}$ for transistor pinched off)	5	20	50	$\mu\text{A/mm}$
R_{on}	On-Resistance	1.9	2.1	2.2	Ωmm

Thermal Specifications

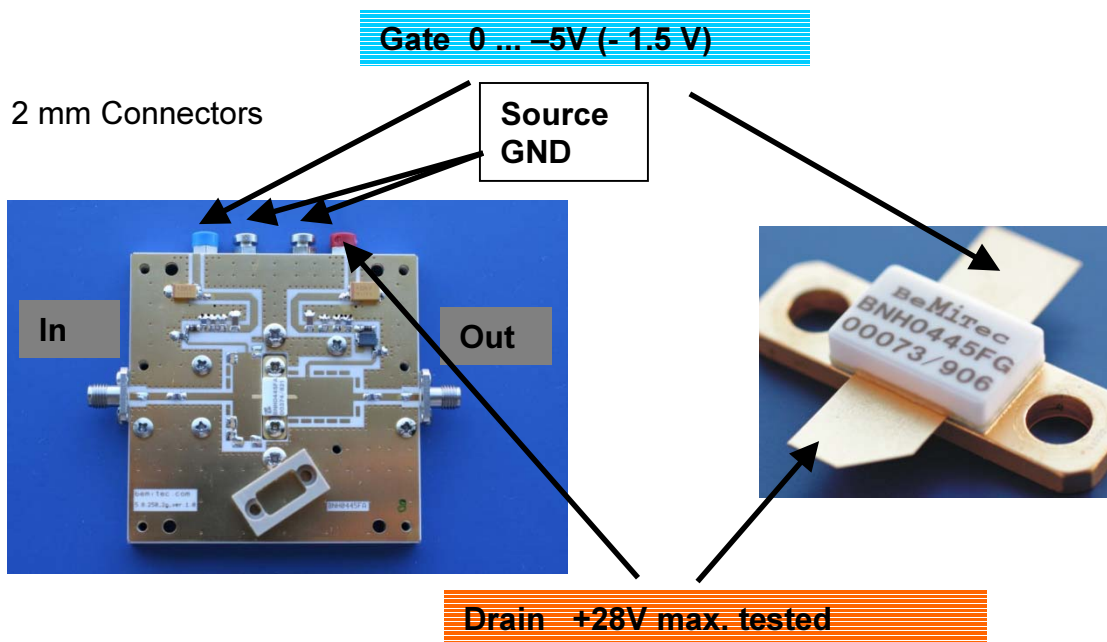
Operating Temp. Range ($^{\circ}\text{C}$)	-25 ~ +70
Thermal Resistance ($^{\circ}\text{C/W}$)	3.5

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Typical RF-Specifications (Load pull)

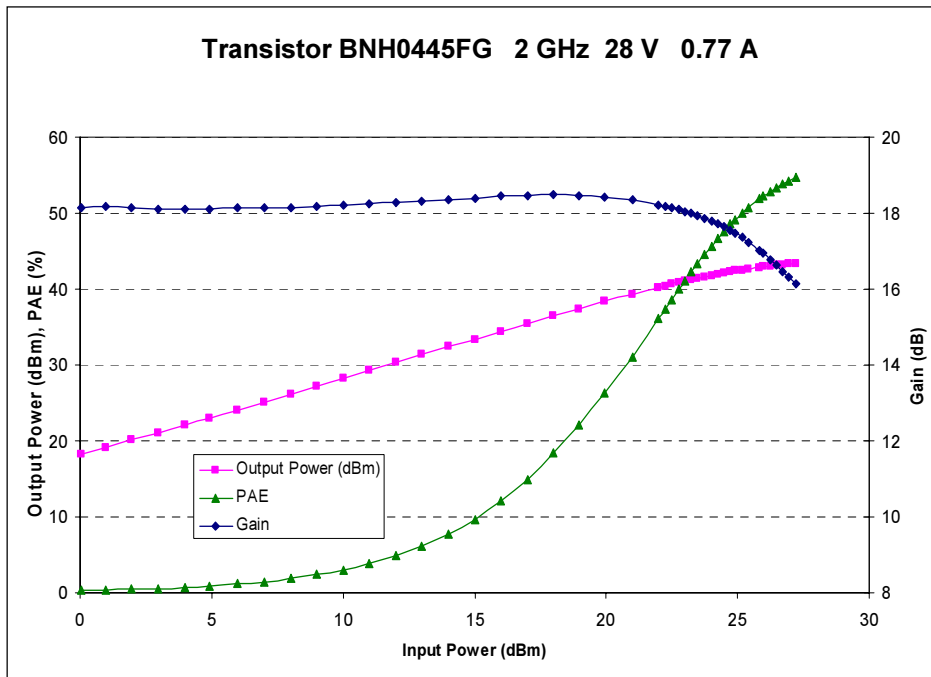
Parameter	Specifications / $V_{DS} = 28 \text{ V (15 V)} / I_q = 0.7 \text{ A}$				
	0.9	1.8	2.14	2.64	3.5
Frequency (GHz)	0.9	1.8	2.14	2.64	3.5
Small Signal Gain (dB)	21	18	17 (16)	13	11
-1 dB Compression Point (dBm)	43 (41)			TBD	
Power Added Efficiency (PAE)	50% (65%) @ P_{SAT} matched for optimum PAE				

BeMiTec Testboard for measurements in 50 Ω environment



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RF-Measurements



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

Typical load and source impedance for optimum PAE:

$$\Gamma_{\text{source}} \quad \text{Re} = -0.96 \\ \text{Im} = -0.17$$

$$\Gamma_{\text{load}} \quad \text{Re} = -0.85 \\ \text{Im} = +0.15$$

Package Dimensions (A191, Kyocera) (in inches)

