

Gallium Nitride 50W RF Power Transistor

Description

The NGN50050HC2 is an internally input matched single ended 50W GaN HEMT, ideal for power amplifier applications up to 5GHz.

This is a versatile transistor that can be used in a multitude of applications with CW, pulsed or complex modulations.



Applications

- 5G, Radar, Satcom, Wideband
- Class AB, Doherty amplifiers

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	180	Vdc
Gate-Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	55	Vdc
Maximum gate current	I_{GS}	8	mA
Storage Temperature Range	T_{STG}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C
Load Mismatch	VSWR	10:1	Ψ
Thermal Resistance, Junction to Case $T_C=85^\circ\text{C}$, $P_{BISS}=40\text{W}$ Pulsed	$R_{\theta JC}$	TBD	°C/W

Electrical Characteristics ($T = 25^\circ\text{C}$ unless otherwise noted)

DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Conditions
Drain-Source Breakdown Voltage	V_{DSS}		200		V	$V_{GS}=-8\text{V}$; $I_{DS}=8\text{mA}$
Gate Threshold Voltage	$V_{GS(th)}$		-3.2		V	$V_{DS}=10\text{V}$; $I_{DS}=8\text{mA}$
Gate Quiescent Voltage	$V_{GS(Q)}$		-3.1		V	$V_{DS}=50\text{V}$; $I_{DS}=80\text{mA}$

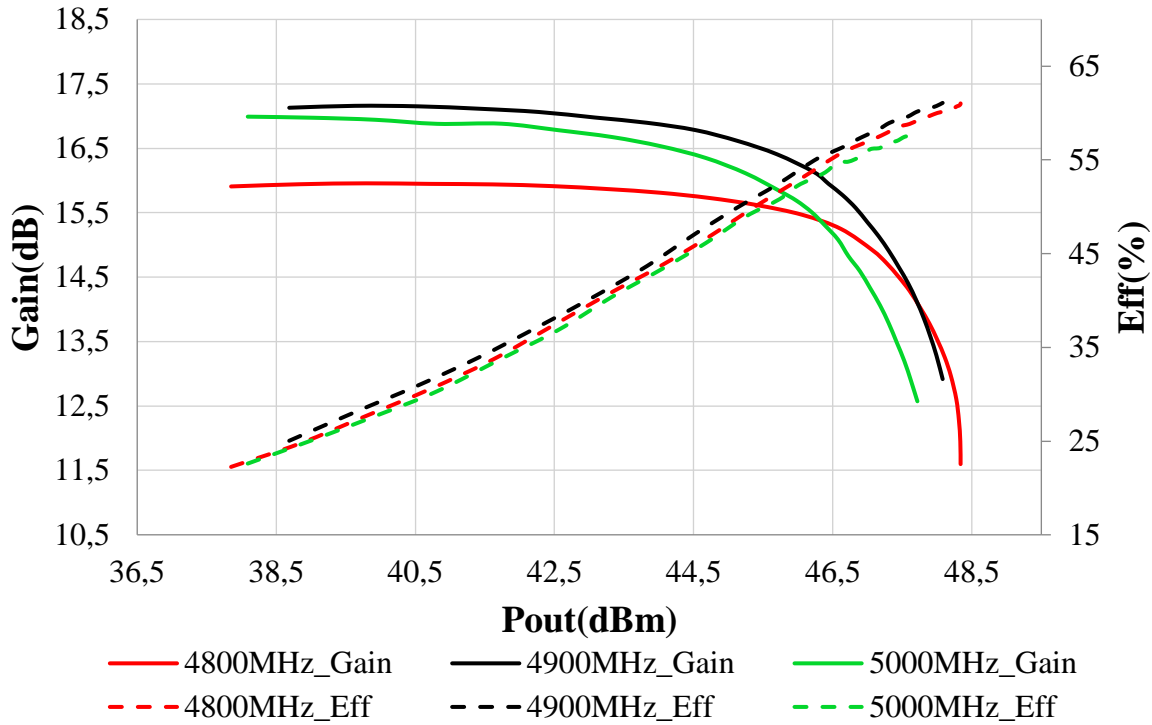
RF Characteristics (Measured in std test fixture, $V_D=48\text{V}$, $F=4.9\text{GHz}$, $I_{DQ}=80\text{mA}$, $T=25^\circ\text{C}$)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output power	P-1dB		40		W	
Output power	P-3dB		55		W	
Power gain	GP-1dB		16		dB	
Efficiency	η P-3dB		60		%	

Typical RF performance Characteristics

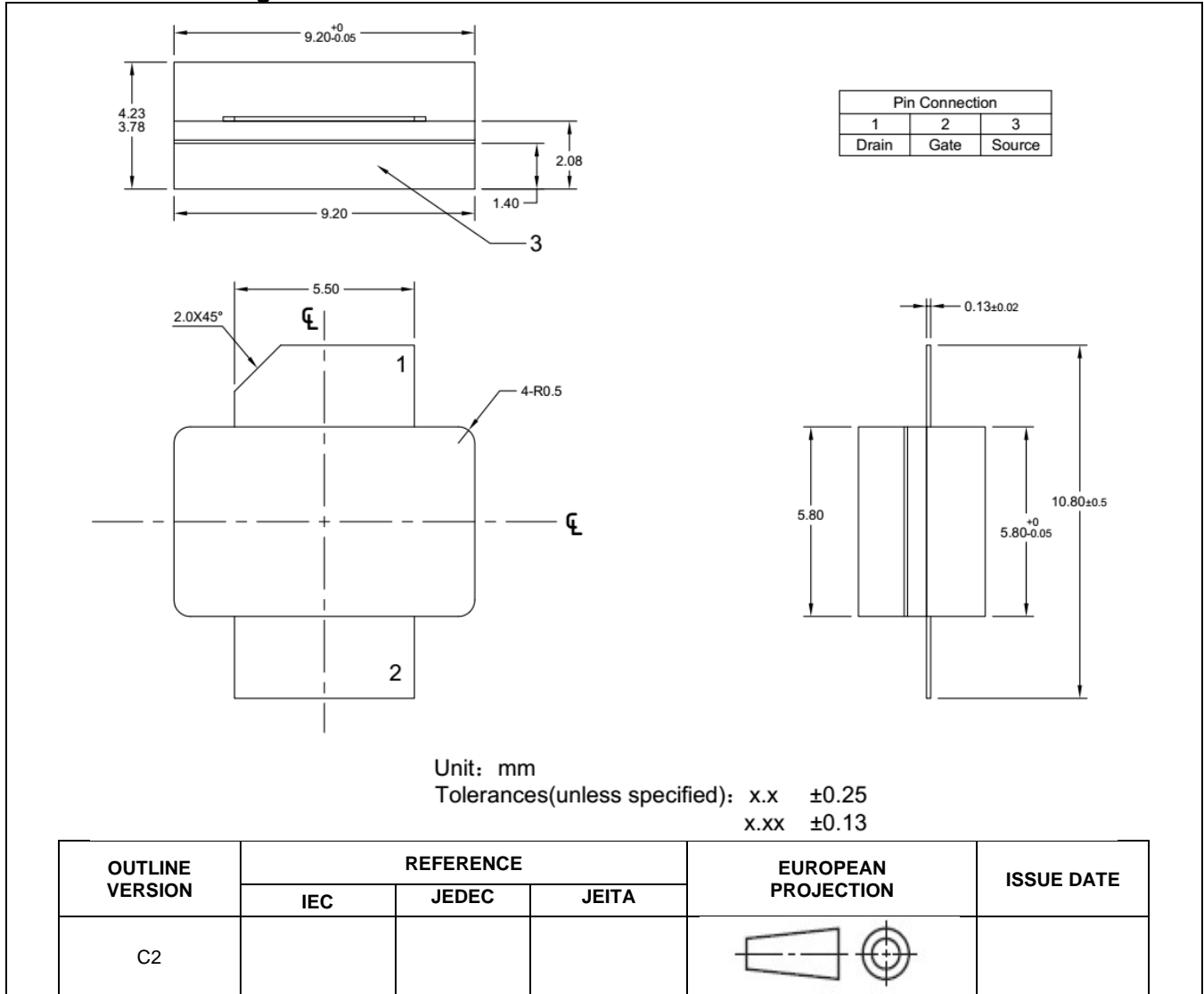
As measured in standard test fixture

Class AB $V_{DS}=48V$, $I_{dq}=80mA$
Pulsed RF 10 μ s/10%



Efficiency and power gain vs Pout

Package Outline Metal-Ceramic Package



Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Notice

Specifications are subject to change without previous notice.

Typical parameters reflect expected average performance as measured in standard test fixtures. It can and will vary in other circuits.

Products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life or any other applications in which the failure of the product could result in personal injury or death.