



Gallium Nitride 28V, 250W, 1.1-1.3GHz RF Power Transistor

Description

The NC1322HS is a 250W, both input and output matched GaN HEMT, ideal for multiple applications from 1.1-1.3GHz, with leading performance. It can support CW, pulse or any modulated signal.

There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical performance across 1.1-1.3GHz class AB application circuit with device soldered

VDS= 28V, IDQ=200mA(Vgs=-2.71V) CW

NC1322HS



Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)	2nd_harmonic(dBc)
1100	40.2	54.51	282.5	16.27	14.31	62.0%	-21.5
1150	40.1	54.4	275.4	16.33	14.3	60.2%	-24.8
1200	41.2	55	316.2	18.5	13.8	61.0%	-28
1250	40.1	54.65	291.7	16.85	14.55	61.8%	-34
1300	39	54	251.2	14.35	15	62.5%	-40

Applications

- L band power amplifier
- GPS, Beidou jammer
- 1.5GHz LTE amplifier

Important Note: Proper 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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+150	Vdc
Gate--Source Voltage	V _{GS}	-10 to +2	Vdc
Operating Voltage	V _{DD}	32	Vdc
Maximum gate current	I _{gs}	72	mA
Storage Temperature Range	T _{stg}	-65 to +150	°C
Case Operating Temperature	T _C	+150	°C
Operating Junction Temperature	T _J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA T _C = 85°C, at T _J =200°C	R _{θJC}	0.7	°C /W

Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=72mA	V _{DSS}		150		V
Gate Threshold Voltage	VDS =10V, ID = 72mA	V _{GS(th)}	-4		-2	V



Gate Quiescent Voltage	VDS =50V, IDS=10mA, Measured in Functional Test	V _{GS(Q)}		-2.71		V
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Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.2 GHz, Pout=250W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2:Pout, Efficiency and power gain across 1.1-1.3GHz class AB) CW signal

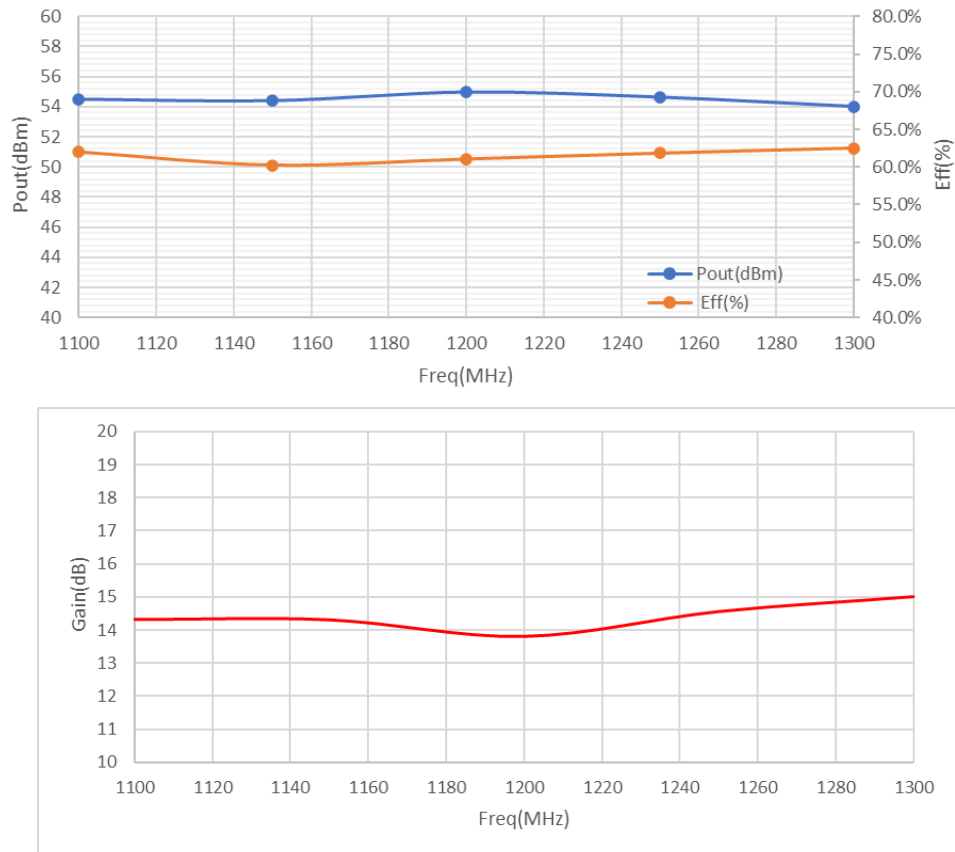


Figure 3: Network analyzer output, S11 and S21 (VDS=28V VGS=-2.61V IDQ=500mA)

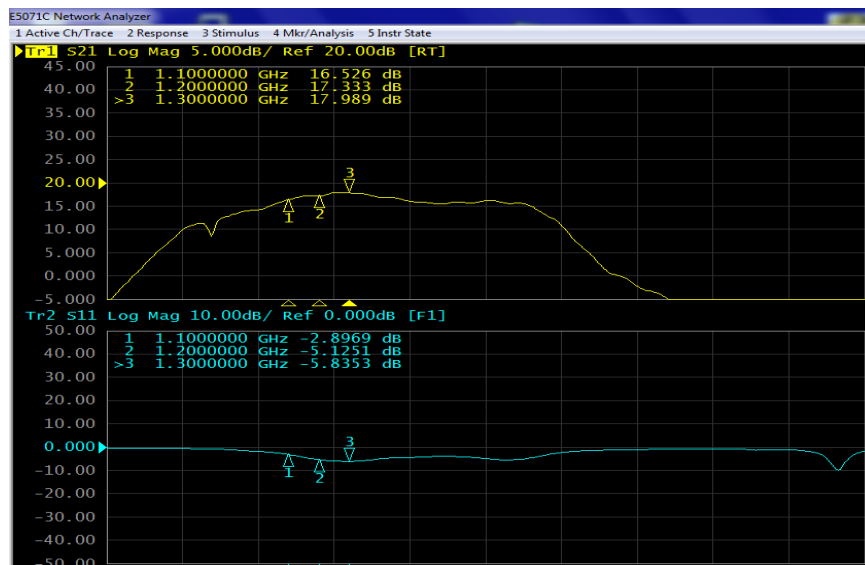


Figure 4: Picture of application board 1.1-1.3GHz class AB

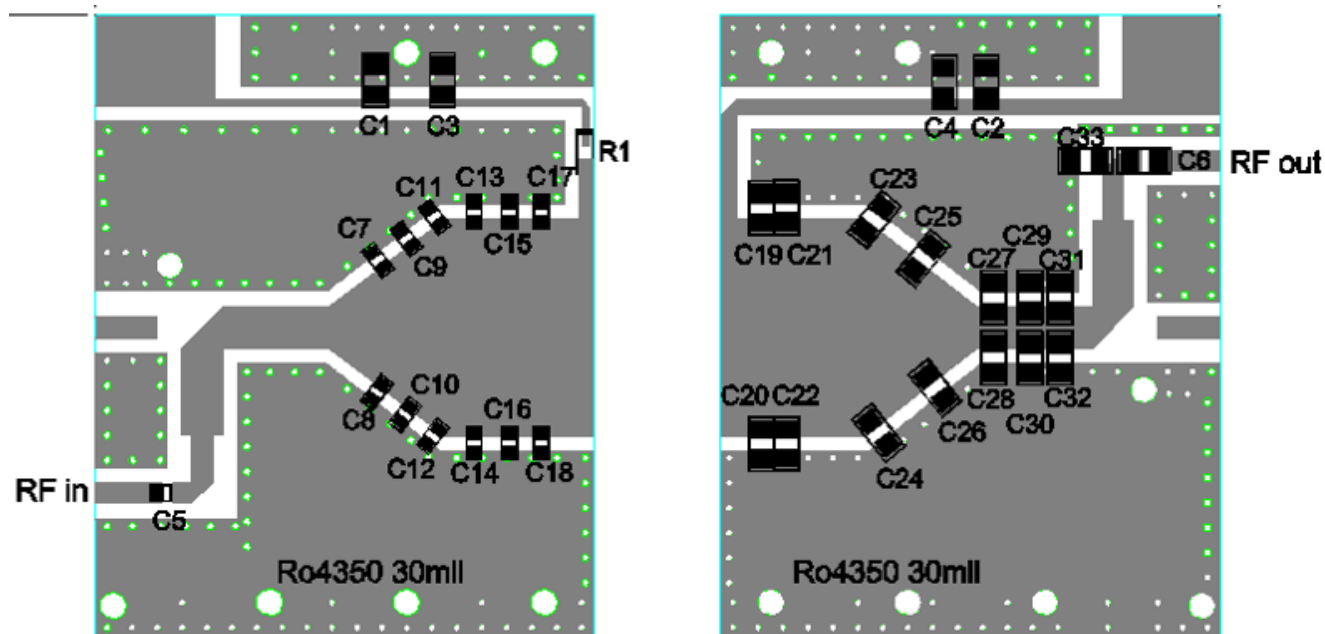


Table 4. Bill of materials of application board (PCB layout upon request)

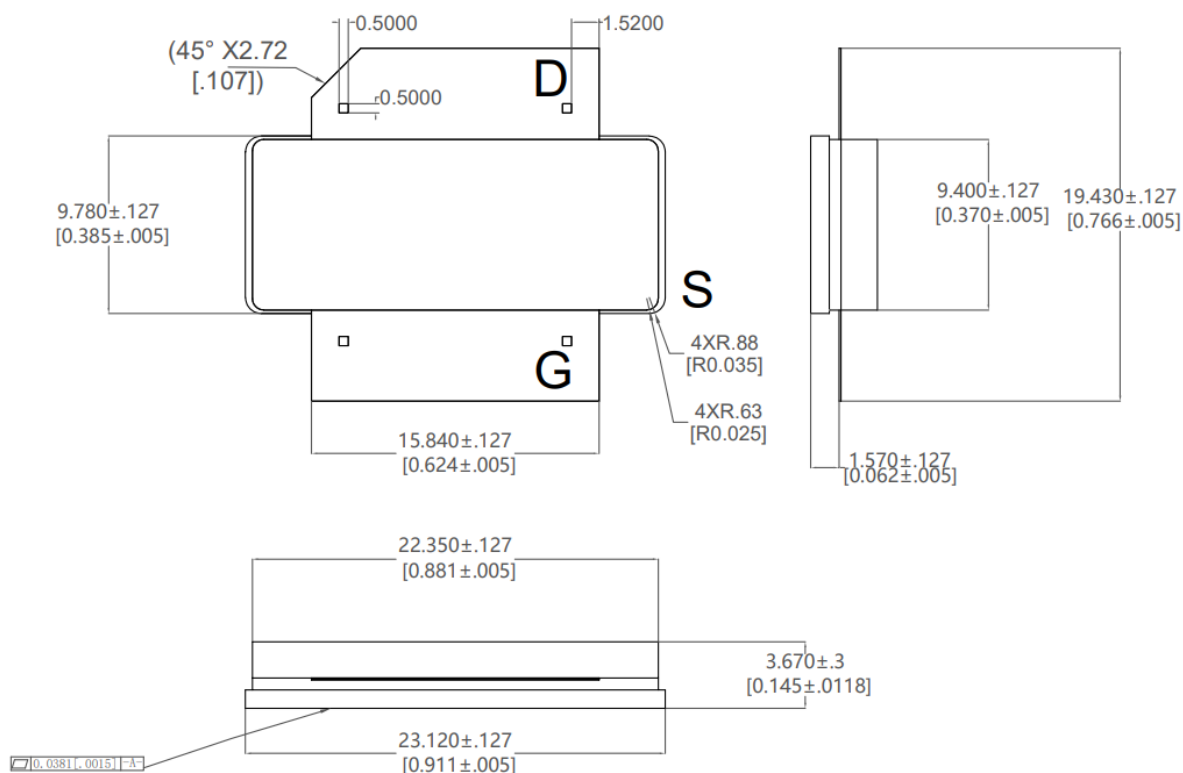
Component	Description	
C3、C4、C5、C6	18pF	Beijing YN MQ101111
C1、C2	10uF/50V	1210
C7、C8	2.2pF	Beijing YN MQ200805
C9、C10、C11、C12	0.5pF	Beijing YN MQ200805
C13、C14、C15、C16、C17、C18	1pF	Beijing YN MQ200805
C19、C20	3.3pF	Beijing YN MQ101111
C21、C22	2pF	Beijing YN MQ101111
C23、C24	1.5pF	Beijing YN MQ101111
C25	1pF	Beijing YN MQ101111
C26、C27、C28、C29、C30、C31、C32、C33	0.5pF	Beijing YN MQ101111
R1	Chip Resistor,9.1Ω,1206	
PCB	30Mil Rogers 4350B	



Package Outline

Flangeless ceramic package;

INP-688-2-EL (C2)



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-C2					09/27/2018



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2022/8/23	V1.0	Preliminary Datasheet Creation

Application data based on: JF-22-15

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