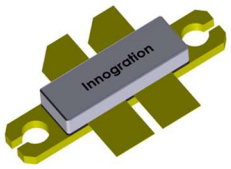
NX2530RH GaN TRANSISTOR

Document Number: NX2530RH
Preliminary Datasheet V2.0

Gallium Nitride 28V 300W, RF Power Transistor

NX2530RH



Description

The NX2530RH is a 300W 28V, GaN HEMT, designed for multiple applications with frequencies up to 2.5GHz.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

•Typical performance (on Innogration wideband fixture with device soldered)

V_{DD}=30V I_{DQ}=120mA, CW

Freq(MHz)	Pout(dBm)	Pout(W)	IDS(A)	Pin(dBm)	Gain(dBm)	Eff(%)
500	53.82	241.0	11.6	35.8	18.02	69.25
600	53.19	208.4	11.1	36.9	16.29	62.60
700	53.5	223.9	11.2	35.86	17.64	66.63
800	52.86	193.2	10.1	36.03	16.83	63.76
900	52.69	185.8	10.7	35.37	17.32	57.88
1000	52.93	196.3	13.4	36.37	16.56	50.04

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

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 (28V)
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 (Not simultaneous, TC = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current	Igmax	72	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+225	°C

1. **Continuous operation at maximum junction temperature will affect MTTF**
2. **Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase**

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, DC Power Dissipation(See note 1)	$R_{\theta JC-DC}$	0.6	C/W

$R_{\theta JC-DC}$ is tested at only DC condition, it is related to the highest thermal resistor value among all test conditions. It might be differently lower in different RF operation conditions like CW signal ,pulsed RF signal etc.

Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

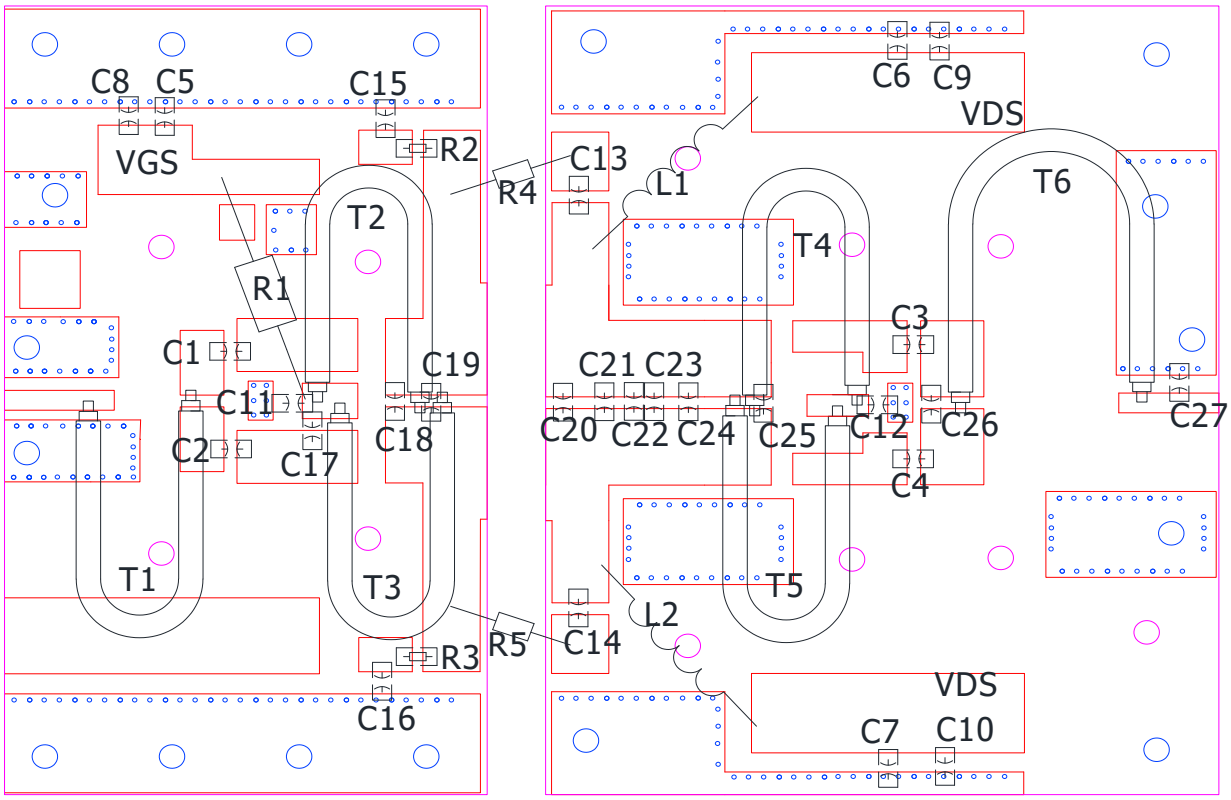
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=72mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =72mA	V_{GS}(th)	-4	-	-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=200mA, Measured in Functional Test	$V_{GS(Q)}$		-2.7		V

Functional Tests (In Innogration narrow band Test Fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 200 mA, f = 1000 MHz, Pulse CW

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ P_{sat}	Gp		16		dB
Drain Efficiency @ P_{sat}	Eff		65		%
Saturated Power	P_{sat}		300		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Figure 1: Network analyzer output, S11 and S21

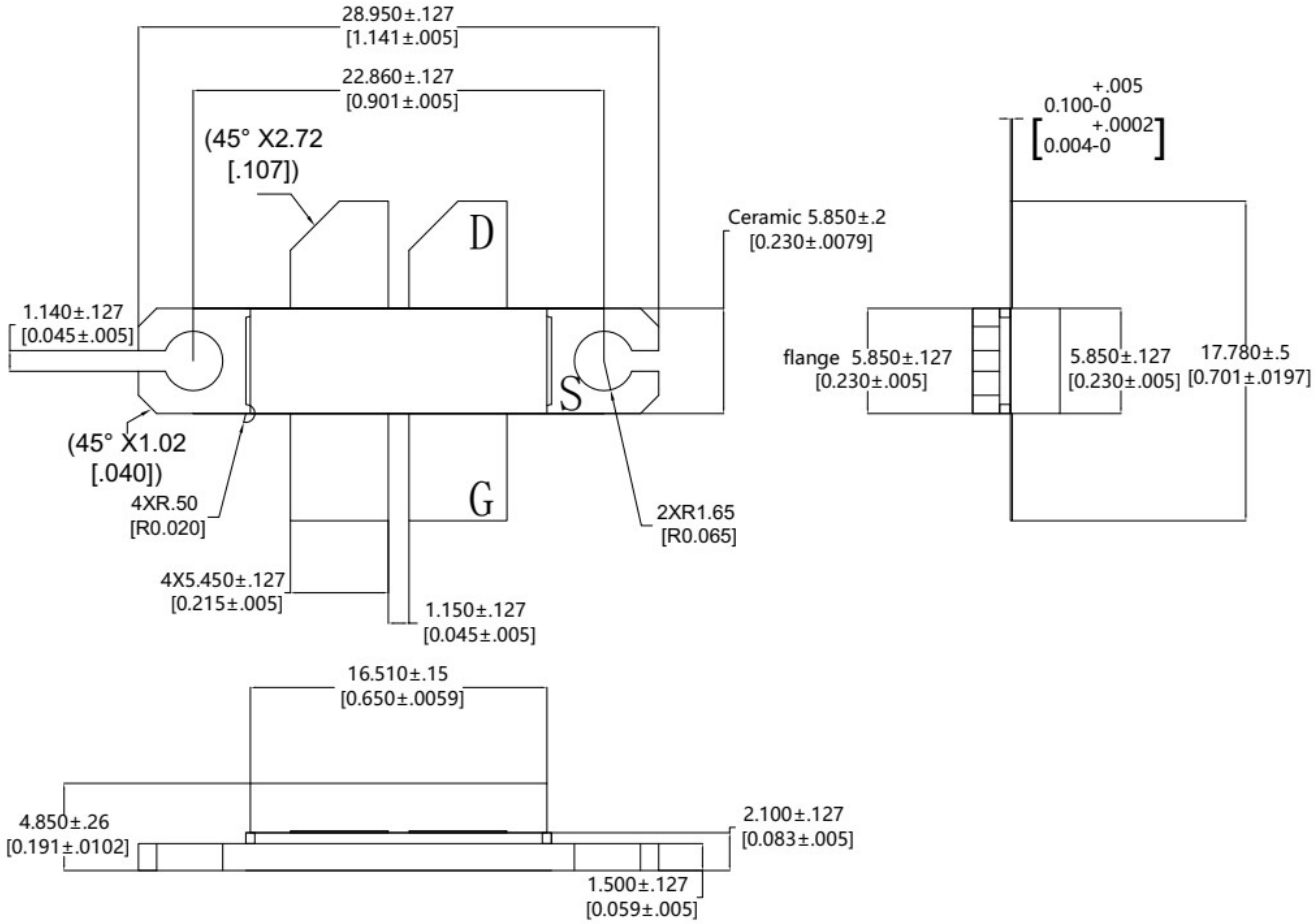
Figure 2: Picture of application board 500-1000MHz class AB



Component	Description	Suggested Manufacturer
C1,C2,C3,C4,C5,C6,C7	100pF	DLC70B
C8,C9,C10,C11,C12,C13,C14	10uF	10uF/100V
C15,C16	300pF	DLC70B
C17,C21,C23,C25	3.9pF	DLC70B
C18,C19	5.6pF	DLC70B
C20,C22	1.8pF	DLC70B
C24	2pF	DLC70B
C26	3.9pF+2pF 叠放	DLC70B
C27	1.8pF+1pF 叠放	DLC70B
R1	150Ω	
R2,R3	51Ω*3 并联	1206
R4,R5	142Ω	
T1,T6	50ohm,4cm	
T2,T3	25ohm,3cm	
T4,T5	16.7ohm,4cm	
L1,L2	Φ=1.2mm 长度=6cm	
PCB	30Mil RO4350B	

Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-LB					05/21/2021

Figure 1. Package Outline PKG-LB(LBB)

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2022/5/18	V1.0	Preliminary datasheet creation
2024/6/12	V2.0	Combine NX2530H and NX2530RH and state 2.5GHz supportable

Application data based on HL-22-07

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