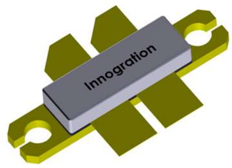
NX3026RH GaN TRANSISTOR

Document Number: NX3026RH
Preliminary Datasheet V1.1

Gallium Nitride 28V 260W, RF Power Transistor

NX3026RH



Description

The NX3026RH is a 260W 28V, GaN HEMT, designed for multiple applications with frequencies up to 2.7GHz.

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

• Typical performance (on Innogration narrow band fixture with device soldered)
V_{DD}=28V I_{DQ}=130mA, CW.

NX3026RH VGS=-2.48V VDS=28V IDQ=130mA CW								
Freq (MHz)	Psat (dBm)	Psat (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff(%)	2nd （dBc）	3rd （dBc）
200	52.31	170.2	6.93	32.55	19.76	87.72	-22.0	-14.5
300	52.15	164.1	7.78	32.94	19.21	75.31	-33.60	-15.70
400	52.42	174.6	9.83	32.70	19.72	63.43	-32.80	-15.60
500	52.67	184.9	12.45	33.46	19.21	53.05	-39.10	-25.00
600	53.01	200.0	10.78	34.41	18.60	66.26	-34.80	-27.20
700	53.07	202.8	9.54	35.10	17.97	75.91	-53.80	-31.10
800	52.59	181.6	9.45	36.32	16.27	68.61	-40.60	-42.70
900	52.56	180.3	9.55	36.86	15.70	67.43	-32.30	-34.80
1000	52.67	184.9	10.54	36.78	15.89	62.66	-33.70	-27.60

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}	36	Vdc
Maximum Forward Gate Current	Igmax	60	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
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	240	W

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)	$R_{\theta JC\text{-}DC}$	0.8	C/W

$R_{\theta JC\text{-}DC}$ 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}=60mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =60mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=2000mA, Measured in Functional Test	$V_{GS(Q)}$		-2.45		V

Functional Tests (In Innogration narrow band Test Fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 2000 mA, f = 1300 MHz, CW

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ P_{sat}	Gp		16		dB
Drain Efficiency @ P_{sat}	Eff		65		%
Saturated Power	P_{sat}	240	260		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Reference Circuit of Test Fixture Assembly Diagram

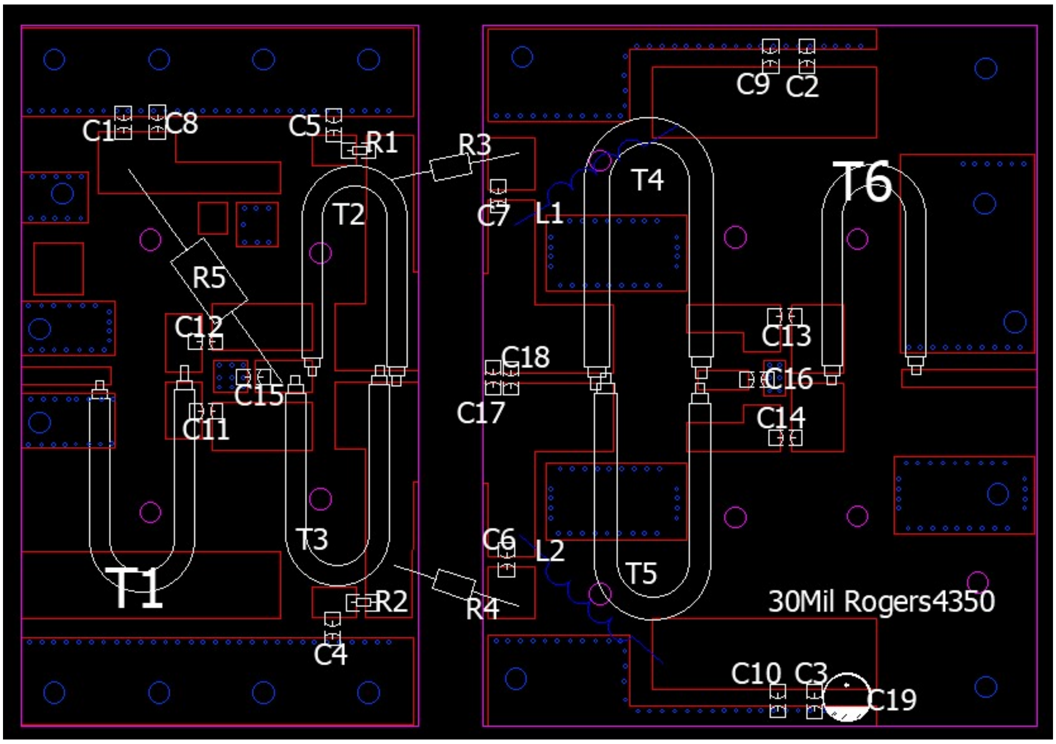
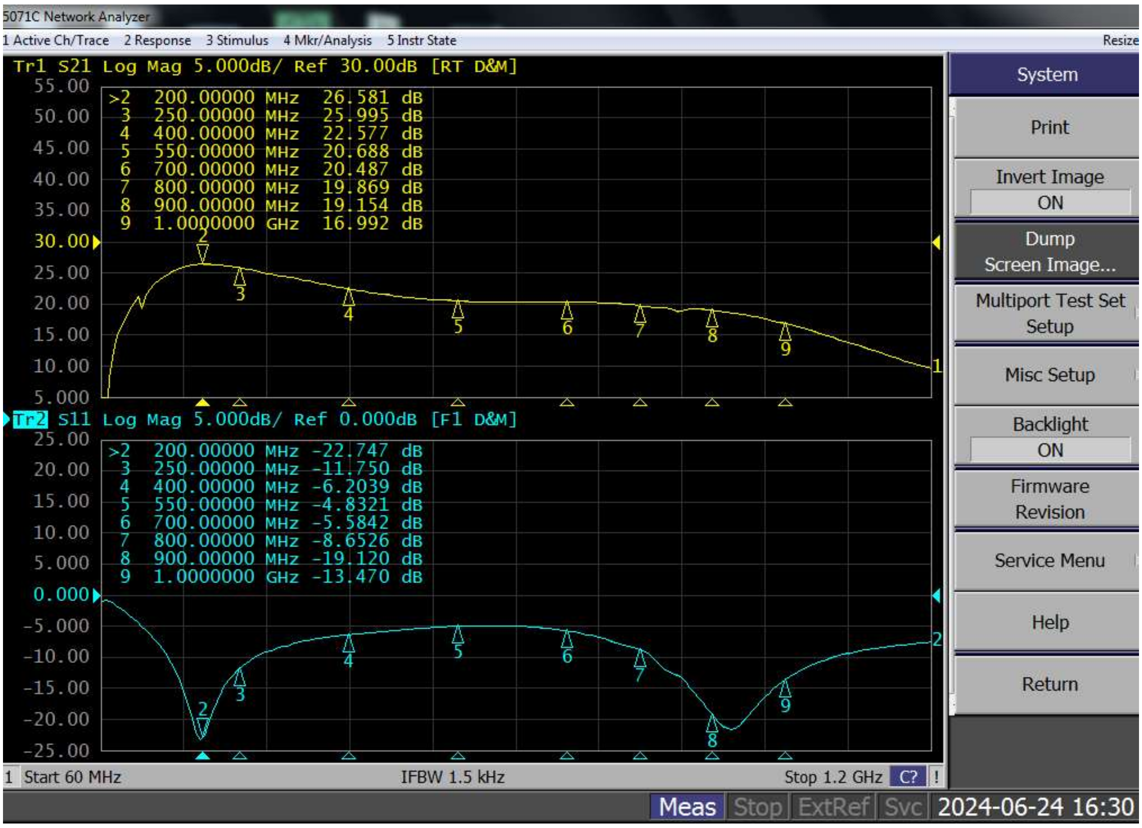


Figure 1. Test Circuit Component Layout (200-1000MHz)

Table 4. Test Circuit Component Designations and Values

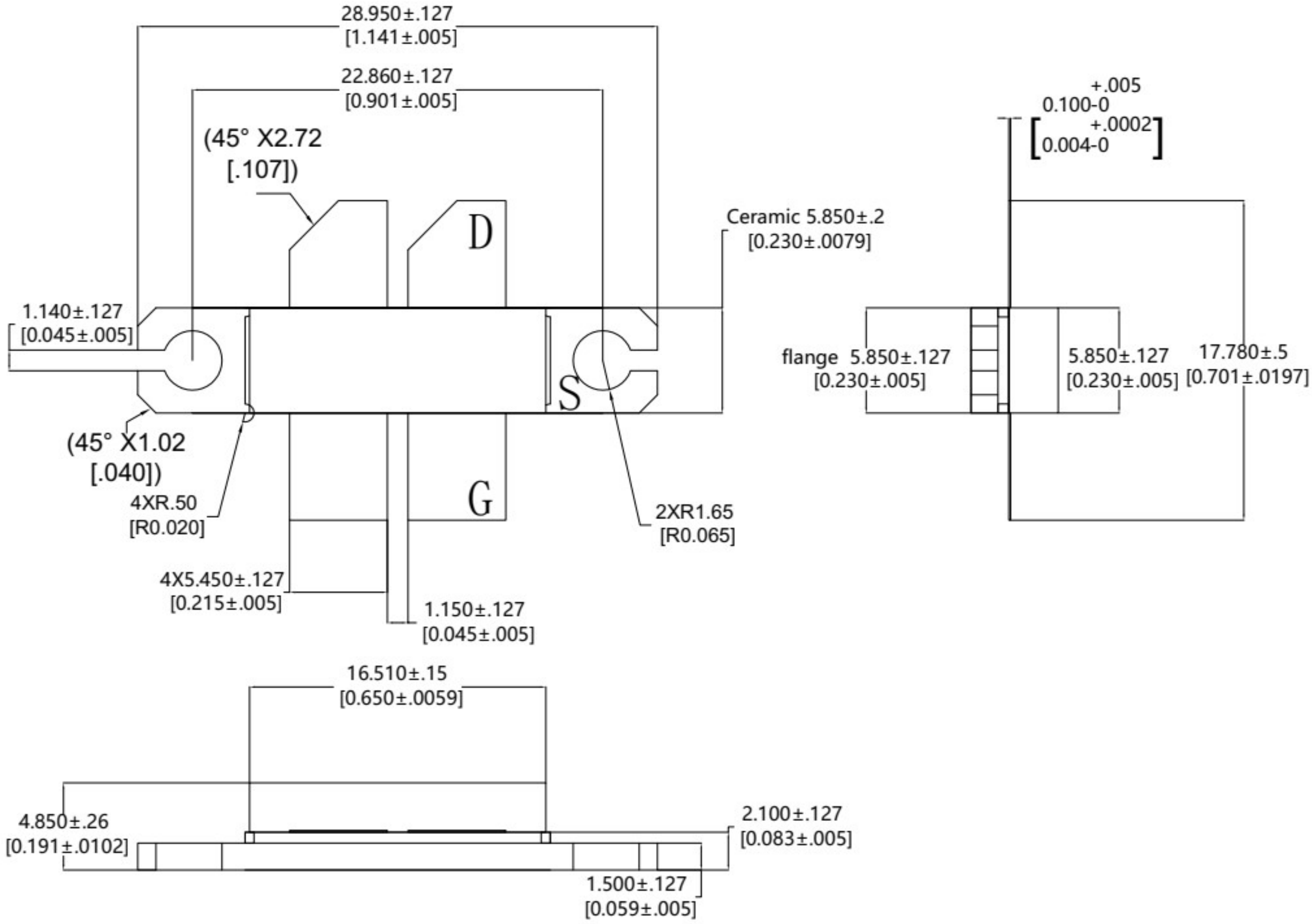
Component	Description	Suggestion
C1~C7	10uF/100V-1210	Ceramic multilayer capacitor
C8~C10,C15,C16	820pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C11~C14	270pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C17	9.1pf	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C18	3pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C19	470uF/63V	Electrolytic Capacitor
R1,R2	10Ω-1206	Chip Resistor
R3~R5	300Ω-3W	Color ring resistance
L1,L2	1.5mm wire，3mm innerdiameter，2turns	DIY
T1	50 ohm，70mm	RFSFBU-086-50
T2~T5	16.7 ohm，50mm	SFF-16.7-1.5
T6	50 ohm，80mm	RFSFBU-086-50
PCB	30Mil Rogers4350	

Figure 2. Network Analyzer result S11 and S21



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
2021/11/22	V1.0	Preliminary datasheet creation
2024/6/24	V1.1	Add application data

Application data based on TC-24-40

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