NR5803HS GaN TRANSISTOR

Document Number: NR5803HS
Preliminary Datasheet V1.0

GaN 28V 30W, VHF to C band RF Power Transistor

NR5803HS

Description

The NR5803HS is a 30W 28V GaN HEMT, implemented with unique match topology, enable extremely wideband applications with frequencies from VHF to C band. It can support CW, and pulse or any modulation format.

To use NR5803HS with broadband circuit topology, it can deliver 20W CW at 32V within 0.3-6.2GHz as its typical ultrawide band application

- Typical performance (on Innogration wide band fixture with device soldered)

NR5803HS VGS=-2.37V VDS=32V IDQ=220mA CW								
Freq (MHz)	Pout (dBm)	Pout (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff (%)	2nd （dBc）	3rd （dBc）
300	43.65	23.2	0.86	31.00	12.65	84.21	-12.90	-15.00
500	43.97	24.9	1.15	30.72	13.25	67.79	-17.20	-11.90
1000	44.56	28.6	2.01	32.08	12.48	44.43	-10.70	-12.40
1500	45.39	34.6	2.63	36.19	9.20	41.10	-11.40	-16.20
2000	46.04	40.2	3.11	37.82	8.22	40.37	-13.30	-18.30
2500	46.63	46.0	2.87	37.39	9.24	50.12	-16.30	-27.30
3000	45.51	35.6	2.64	37.35	8.16	42.10	-17.00	-25.40
3500	45.76	37.7	3.31	37.28	8.48	35.56	/	/
4000	45.66	36.8	3.06	37.60	8.06	37.59	/	/
4500	46.08	40.6	3.01	37.52	8.56	42.10	/	/
5000	45.48	35.3	2.90	37.38	8.10	38.06	/	/
5500	44.84	30.5	2.79	36.27	8.57	34.14	/	/
6000	44.13	25.9	2.84	36.08	8.05	28.48	/	/
6200	43.34	21.6	2.83	36.31	7.03	23.83	/	/

Recommended driver: G2MAH0163—8 (resistor network or attenuator might needed for interstage VSWR

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	9	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= 25°C, T_J=200°C,FEA	$R_{\theta JC-DC}$	2.6	°C/W

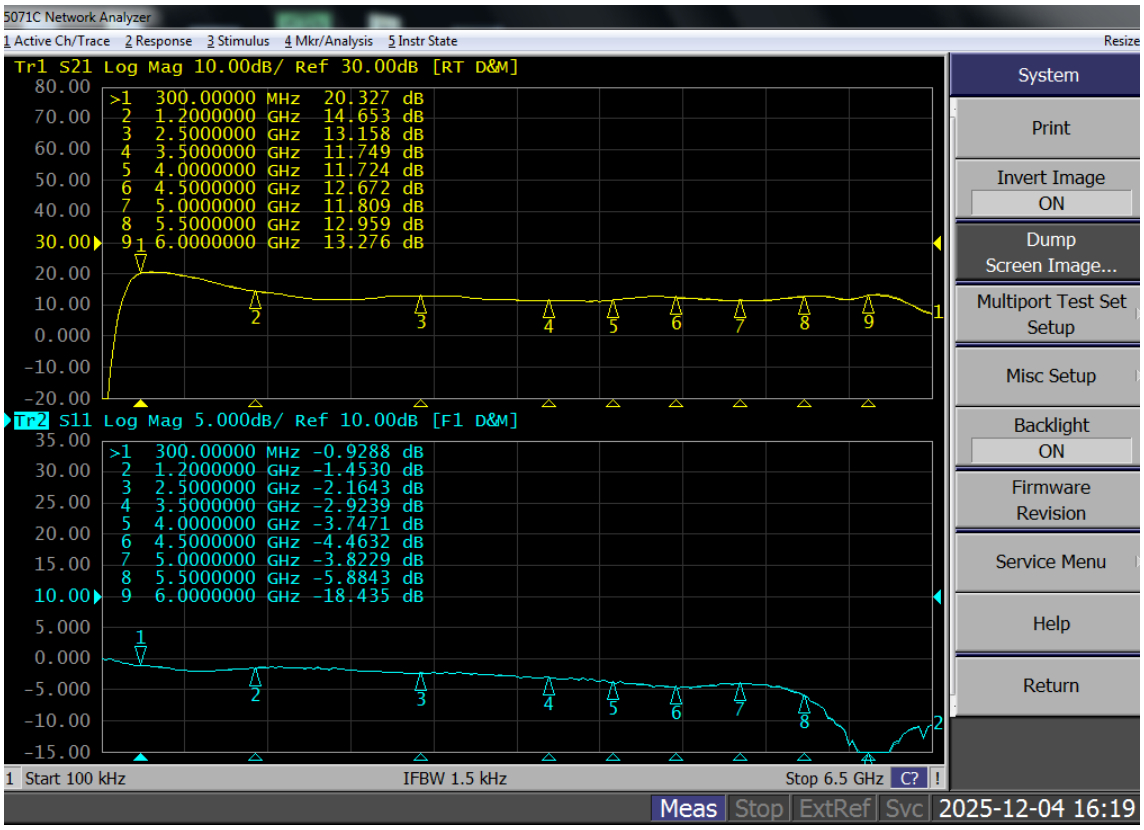
Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=9mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =9mA	V_{GS}(th)		-2.5		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=200mA, Measured in Functional Test	$V_{GS(Q)}$		-2.3		V

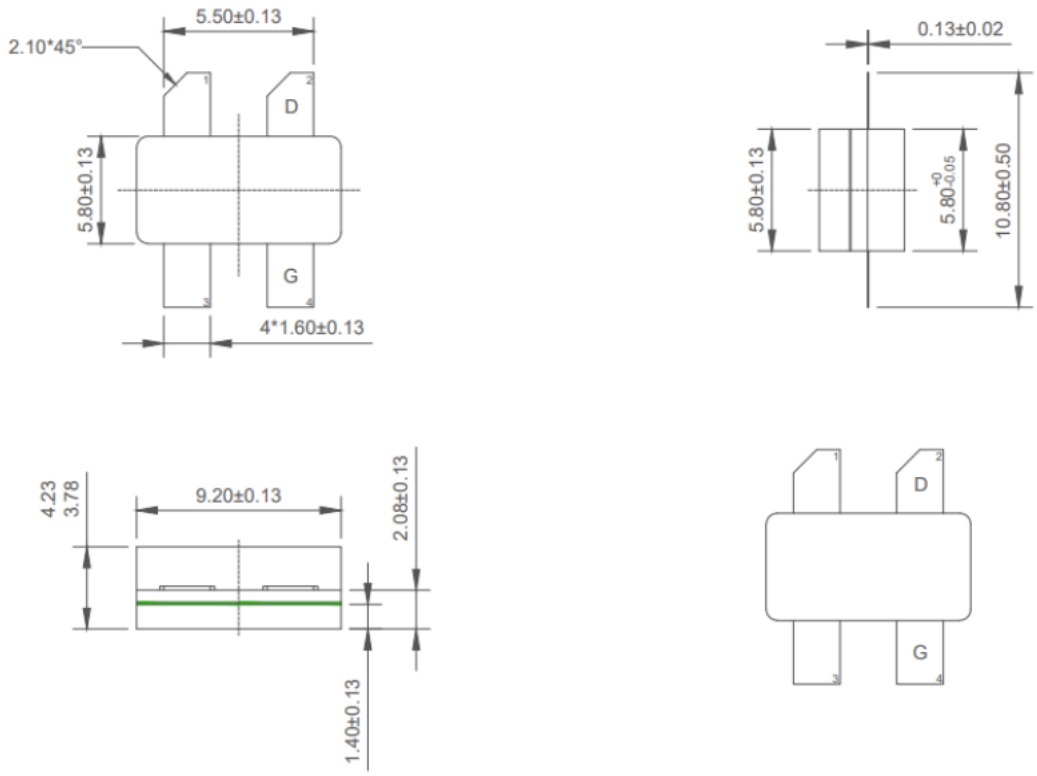
0.3-6.2GHz

Figure 2. Network Analyzer S11/S21 output



Package Outline

Earless ceramic package; 4 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-G4/G4H					3/10/2025

Figure 1. Package Outline PKG-G4/G4H

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/12/4	V1.0	Preliminary datasheet creation, XTAH58030G4H renamed to NR5803HS

Application data based on TC-25-44

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