XR5802HS GaN TRANSISTOR

Document Number: XR5802HS
Preliminary Datasheet V1.0

GaN 28V 20W, VHF to C band RF Power Transistor

XR5802HS

Description

The XR5802HS itself is a 20W 28V GaN HEMT, implemented with unique match topology, enable extremely wideband applications with frequencies from HF to C band. It can support CW, and pulse or any modulation format.

To use paired XR5802HS with broadband circuit topology, it can deliver 30W CW at 32V within 0.3-6.2GHz as its typical ultrawide band application

- Typical performance using XR5802HS*2 (on Innogration fixture with device soldered)

Vds = 32V,Vgs = -2.4V，Idq = 200mA Signal mode: CW

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	Ids(A)	Gain(dB)	Eff (%)	2nd (dBc)	3rd (dBc)
300	31.00	45.20	33.1	1.68	14.2	61.6	-10.4	-13.1
500	30.30	46.05	40.3	1.87	15.8	67.3	-14.3	-14.8
1000	34.40	46.60	45.7	3.02	12.2	47.3	-22.9	-19.3
1500	35.00	45.10	32.4	3.36	10.1	30.1	-30.6	-17.7
2000	38.90	46.10	40.7	3.76	7.2	33.9	-26.8	-13.5
2500	39.00	47.05	50.7	3.63	8.1	43.6	-23.0	-22.1
3000	39.00	45.00	31.6	3.58	6.0	27.6	-29.4	-27.5
3500	39.00	45.70	37.2	3.29	6.7	35.3	/	/
4000	39.00	46.15	41.2	4.15	7.2	31.0	/	/
4500	39.00	46.05	40.3	4.03	7.1	31.2	/	/
5000	39.00	47.54	56.8	3.70	8.5	47.9	/	/
5500	39.00	45.05	32.0	3.89	6.1	25.7	/	/
6000	39.00	46.65	46.2	3.99	7.7	36.2	/	/
6100	37.80	46.25	42.2	3.79	8.5	34.8	/	/
6200	36.20	46.10	40.7	3.68	9.9	34.6	/	/
6400	36.60	45.03	31.8	3.56	8.4	28.0	/	/

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	8	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,FEA	$R_{\theta JC\text{-}DC}$	4.2	°C/W

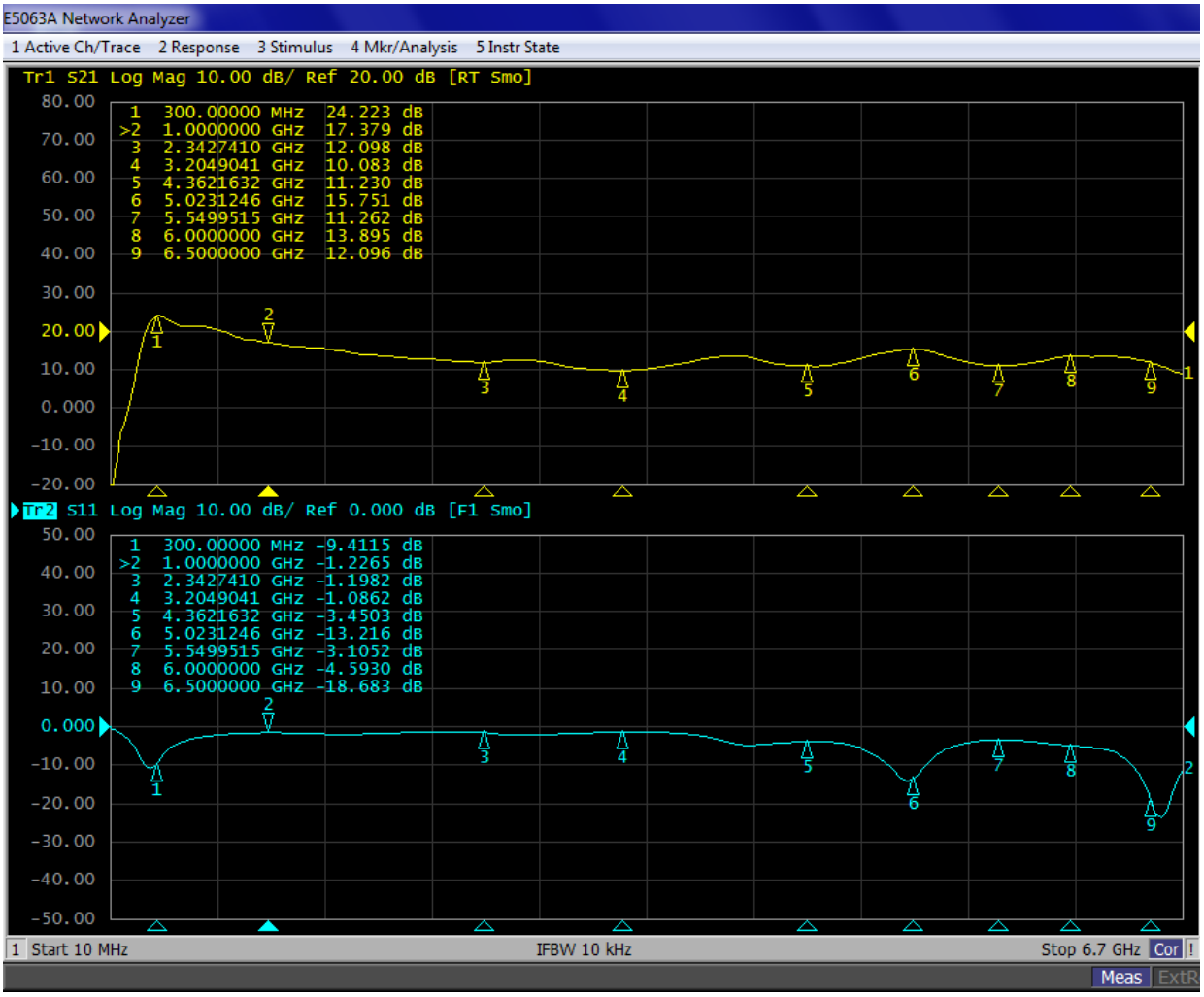
Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=5mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =5mA	V_{GS}(th)		-2.5		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

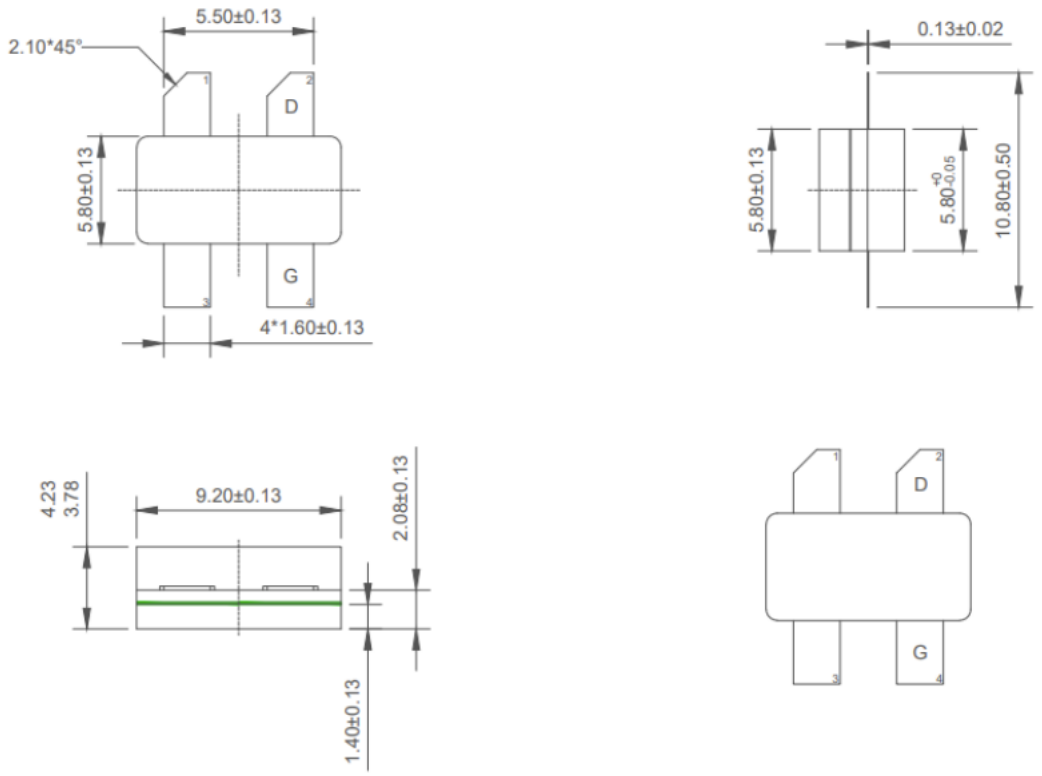
0.3-6GHz with XR5802HS*2

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
2025/11/24	V1.0	Preliminary datasheet creation

Application data based on RXT-25-40

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