



GaN 28V, 250W, 2-3GHz RF Power Transistor

Description

The XTAH27251RC2 is a 250W, both input and output matched GaN HEMT, ideal for multiple applications from 2-3GHz, 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 2.2-2.7GHz class AB application circuit with device soldered at 28V

V_{ds}=28V, V_{gs}=-2.61V, I_{dq}=100mA;

XTAH27251RC2



Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)	2nd(dBc)	3rd(dBc)
2200	38.6	54.25	266.07	14.5	15.65	65.54	-18.60	-32.3
2300	37.7	54.18	261.82	14.8	16.48	63.18	-22.40	-44.8
2400	37.8	54.15	260.02	14.95	16.35	62.12	-23.50	-37.7
2500	38.3	54.15	260.02	14.89	15.85	62.37	-25.10	-40.0
2600	39.2	54.3	269.15	14.98	15.1	64.17	-24.50	-40.5
2700	37.5	54.03	252.93	14.17	16.53	63.75	-26.00	-46.5

● Applications

- S band power amplifier
- ISM
- UAV Jammer

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}	65.4	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 = 25°C, at T _j =200°C	R _{θJC}	0.55	°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	V _{GS} =-8V; I _{DS} =65.4mA	V _{DSS}		150		V



Gate Threshold Voltage	VDS =10V, ID = 65.4mA	V _{GS(th)}	-4		-2	V
Gate Quiescent Voltage	VDS =50V, IDS=500mA, Measured in Functional Test	V _{GS(Q)}		-2.5		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.4GHz, Pout=250W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 3: Network analyzer output, S11 and S21 (VDS=28V VGS=-2.5V IDQ=500mA)

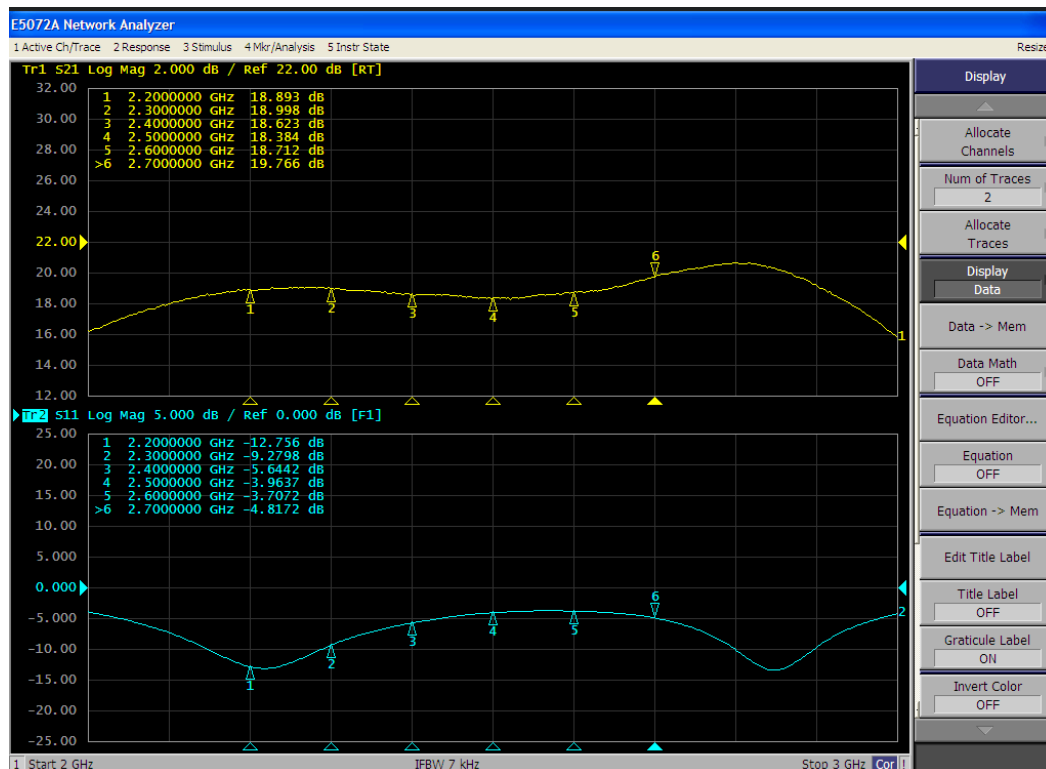


Figure 4: Picture of application board 2.2-2.7GHz class AB

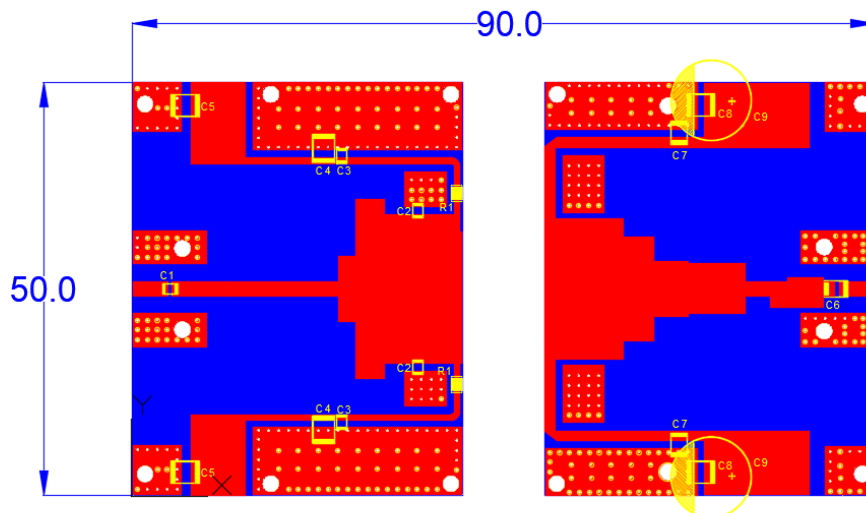




Table 4. Bill of materials of application board (PCB layout upon request)

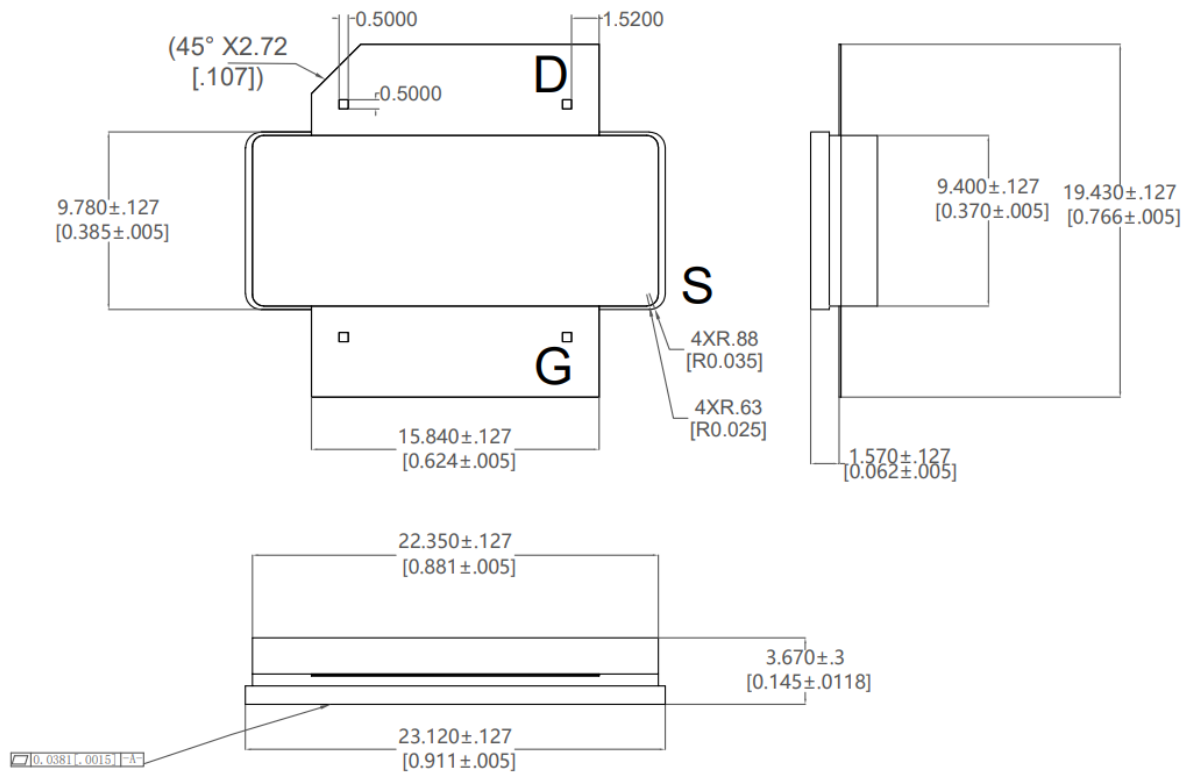
Component	Description	Suggested Manufacturer
C9	470uF/63V	/
C4,C5,C8	10uF	/
C1, C3,	15pF(MQ300805)	
C2	0.5pF(MQ300805)	
C6, C7,	15pF(MQ301111)	
R1	Chip Resistor,10Ω	/
PCB	30mil Rogers 4350B	/



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
2025/8/6	V1.0	Preliminary Datasheet Creation

Application data based on: YHG-25-31

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