GaN 28V, 250W,3-4GHz RF Power Transistor

XTAH35251RC2

Description

The XTAH35251RC2 is a 250W，both input and output matched GaN HEMT, ideal for multiple applications from 3-4GHz, with excellent RF 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 3.3-3.6GHz class AB application circuit with device soldered at 28V **Vds=28V, Vgs=-2.61V,Idq=100mA;**

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)	2nd(dBc)	3rd(dBc)
3300	41	54.5	281.84	16.8	13.5	59.91	-29.60	-53.8
3400	41	54.5	281.84	16.8	13.5	59.91	-28.60	-58.1
3500	41	54.36	272.90	16.3	13.36	59.79	-26.80	-57.6
3600	41	54.55	263.03	15.7	13.2	59.83	-28.60	-55.2

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	Igs	65.4	mA
Storage Temperature Range	Tstg	-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 Tj=200°C	$R_{\theta JC}$	0.55	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit

Drain-Source Breakdown Voltage	VGS=-8V; IDS=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	3.4GHz, 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）

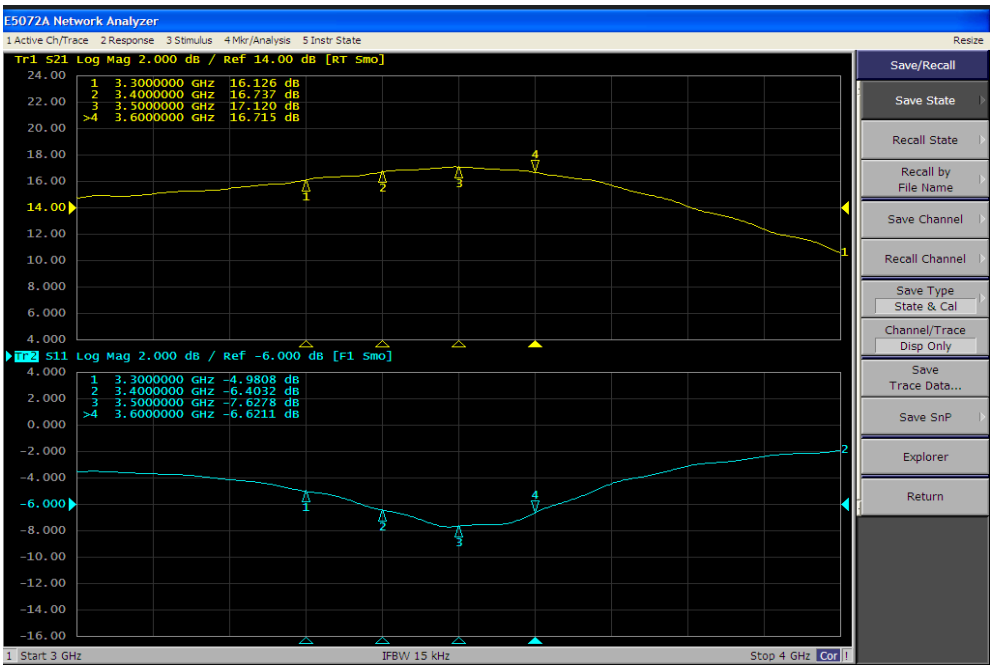


Figure 4: Picture of application board 3.3-3.6GHz class AB

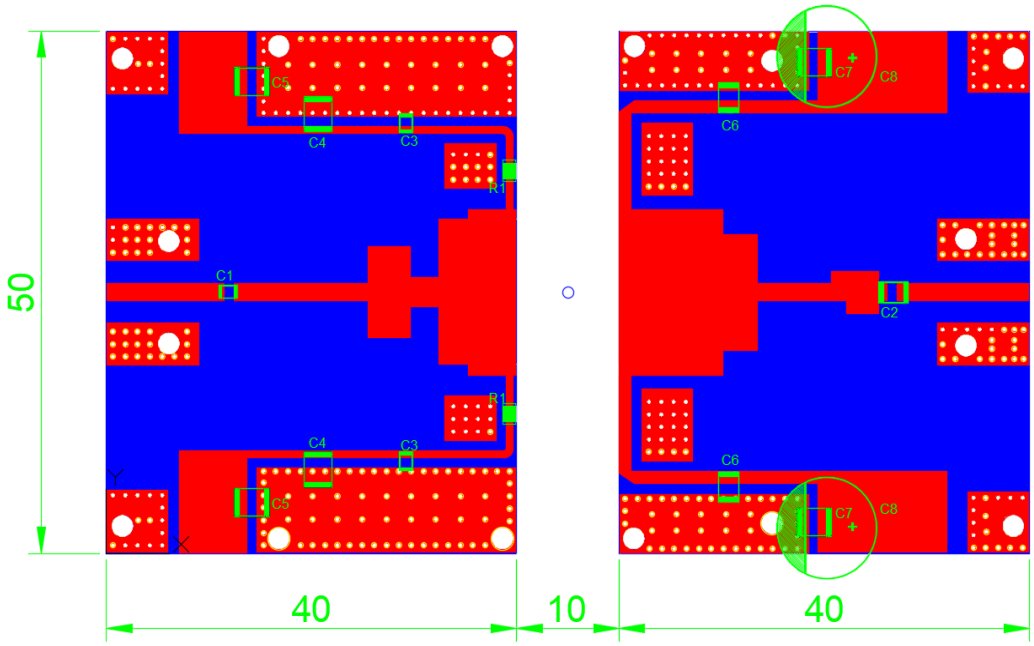


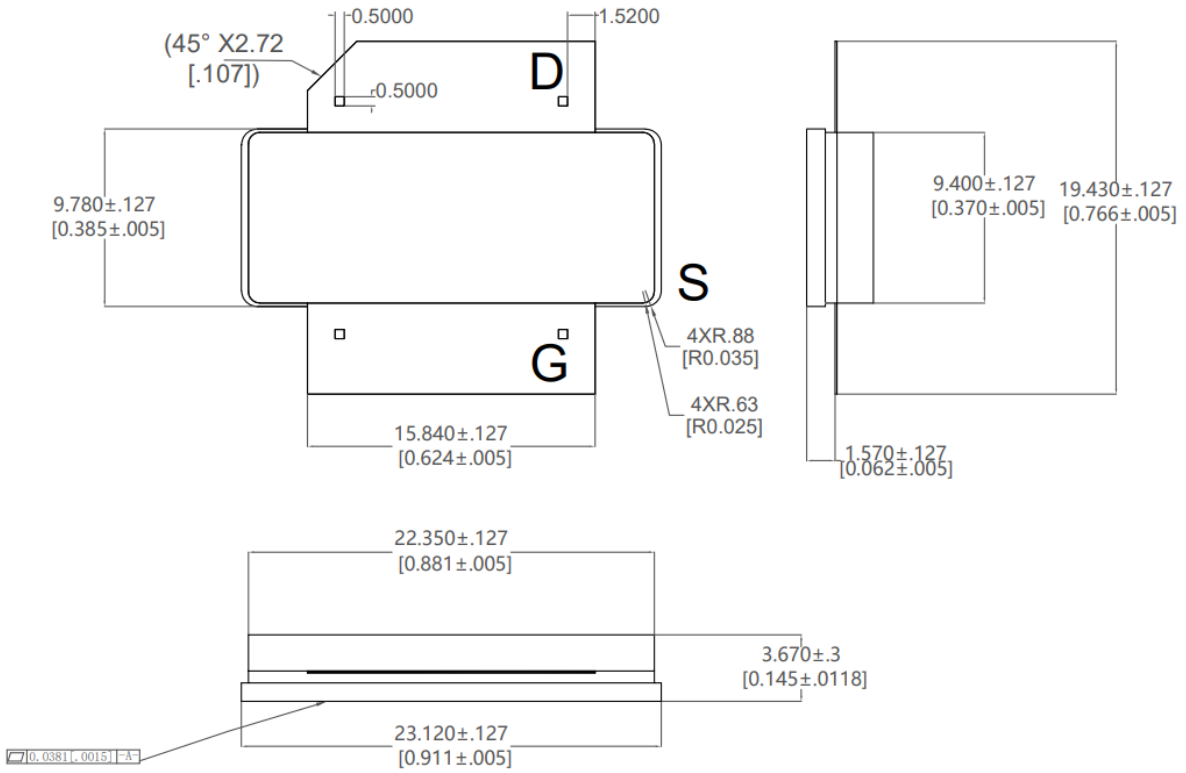
Table 4. Bill of materials of application board (PCB layout upon request)

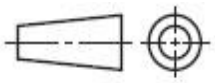
Component	Description	Suggested Manufacturer
C8	470uF/63V	/
C4,C5,C7	10uF	/
C1, C3,	10pF(MQ300805)	
C2, C6,	10pF(MQ301111)	
R1	Chip Resistor,10Ω	/
PCB	30mil Rogers 4350B	/

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
2025/8/26	**V1.0**	**Preliminary Datasheet Creation**

Application data based on: YHG-25-32

Notice