



Gallium Nitride 28V, 200W, 1.1-1.7GHz RF Power Transistor

Description

The GTAH17210RC2 is a 200W, both input and output matched GaN HEMT, ideal for multiple applications from 1.1-1.7GHz, 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 1.1-1.7GHz class AB application circuit with device soldered at 28V/32V

GTAH17210RC2



GTAH17210RC2 VDS=28V VGS=-2.45V IDQ=200mA CW

Freq(MHz)	Psat(dBm)	Psat(W)	IDS(A)	Pin(dBm)	Gain(dB)	Eff(%)
1100	53.19	208.4	12.60	41.11	12.08	59.08
1200	53.45	221.3	13.78	40.15	13.30	57.36
1300	53.12	205.1	13.30	39.22	13.90	55.08
1400	53.37	217.3	15.20	41.74	11.63	51.05
1500	53.68	233.3	15.00	40.76	12.92	55.56
1600	53.43	220.3	13.00	39.90	13.53	60.52
1700	53.05	201.8	11.10	39.83	13.22	64.94

GTAH17210RC2 VDS=32V VGS=-2.45V IDQ=200mA CW

Freq(MHz)	Psat(dBm)	Psat(W)	IDS(A)	Pin(dBm)	Gain(dB)	Eff(%)
1100	54.16	260.6	14.20	42.01	12.15	57.35
1200	54.35	272.3	14.90	40.15	14.20	57.10
1300	53.89	244.9	14.00	39.22	14.67	54.67
1400	54.04	253.5	15.60	41.74	12.30	50.78
1500	54.49	281.2	16.10	41.53	12.96	54.58
1600	54.35	272.3	14.30	40.65	13.70	59.50
1700	53.94	247.7	12.32	39.83	14.11	62.84

Applications

- L band power amplifier
- GPS, Beidou jammer
- 1.5GHz LTE amplifier

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}	72	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 $T_C = 25^\circ\text{C}$, at $T_J = 200^\circ\text{C}$	$R_{\theta JC}$	0.65	°C /W

Table 3. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 54\text{mA}$	V_{DSS}		150		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 54\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$, $I_{DS} = 450\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.2 GHz, $P_{out} = 200\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 3: Network analyzer output, S11 and S21 ($V_{DS} = 28\text{V}$ $V_{GS} = -2.4\text{V}$ $I_{DQ} = 450\text{mA}$)

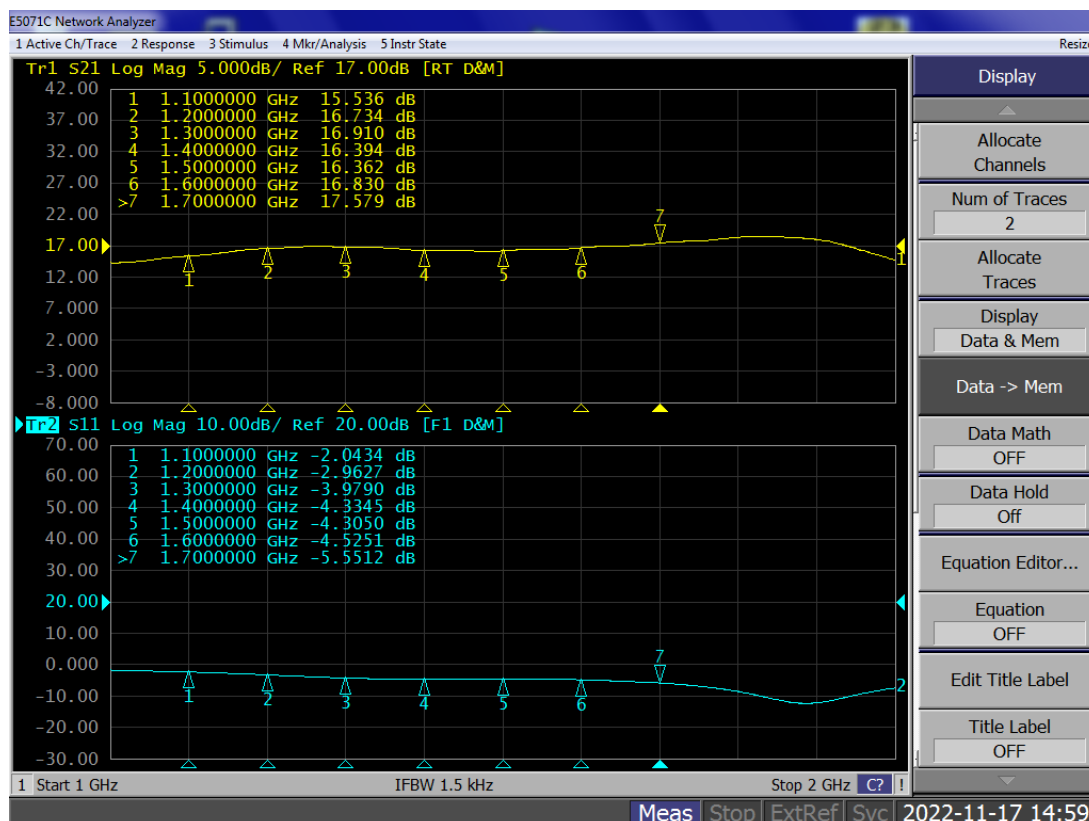


Figure 4: Picture of application board 1.1-1.7GHz class AB

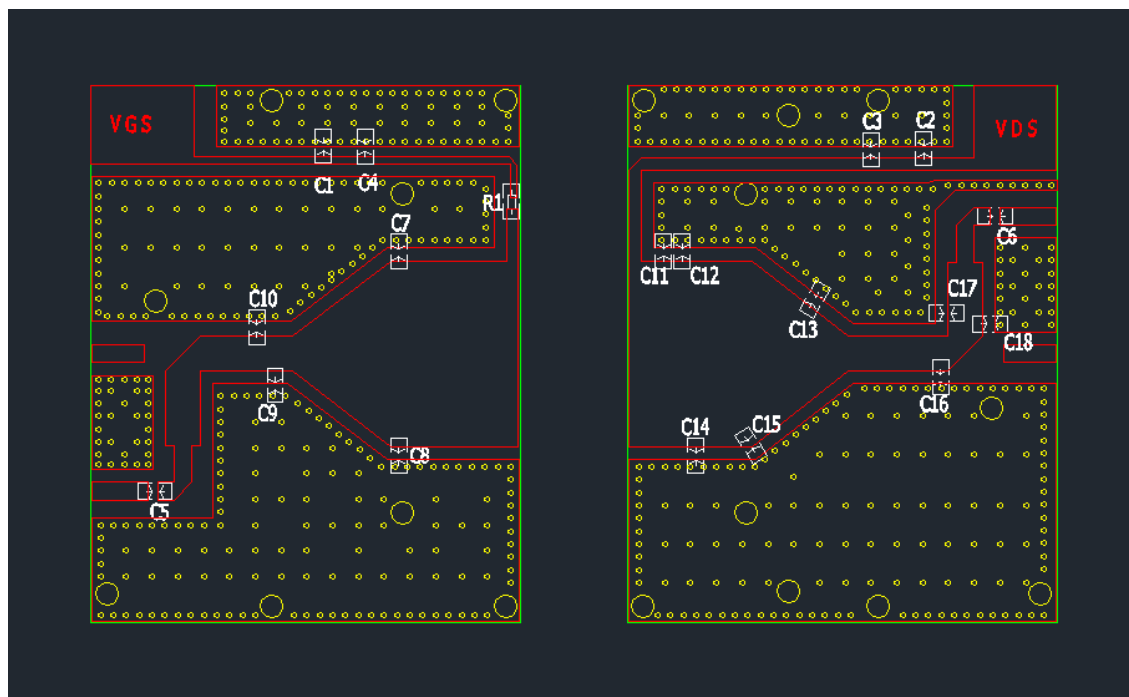


Table 4. Bill of materials of application board (PCB layout upon request)

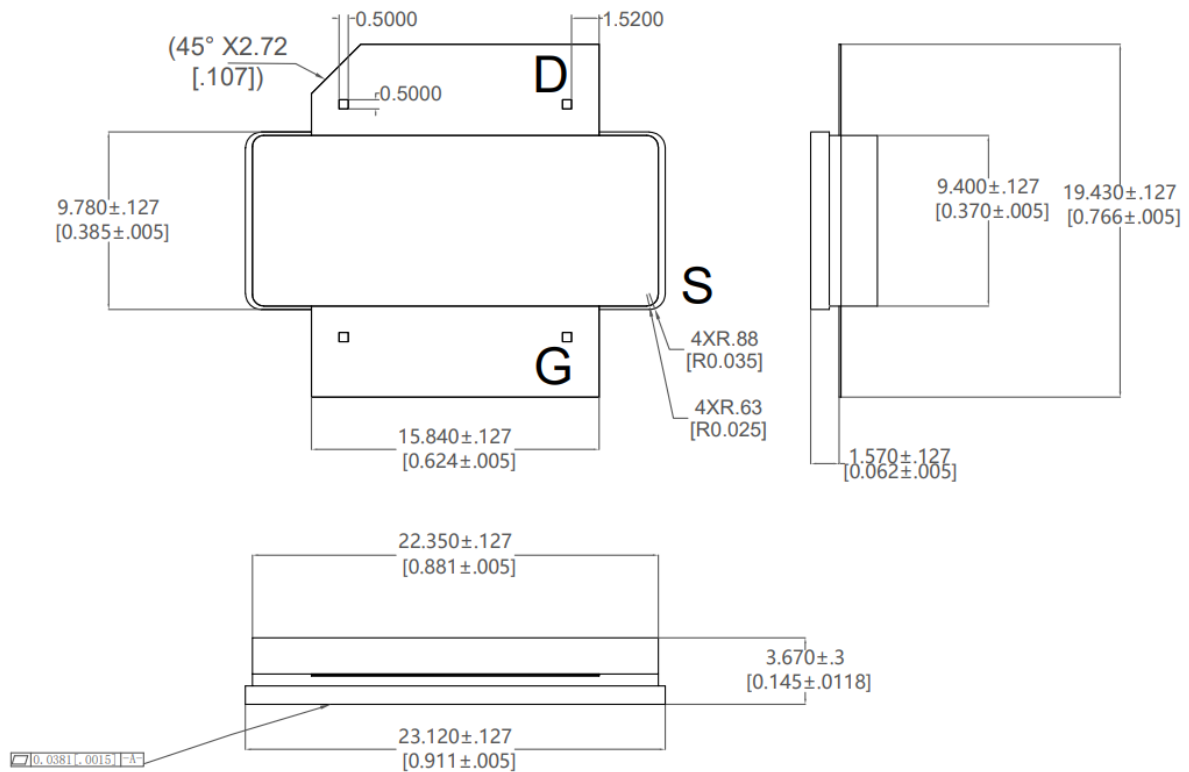
Component	Description	Suggested Manufacturer
C1,C2,	10uF	10uF/50V
C3,C4,C5,C6	18pF	Beijing YN MQ101111
C7,C8	2.2pF	Beijing YN MQ101111
C9,C15	1.5pF	Beijing YN MQ101111
C10	1pF	Beijing YN MQ101111
C11	3.3pF	Beijing YN MQ101111
C12,C16,C17,C18	0.5pF	Beijing YN MQ101111
C13	2pF	Beijing YN MQ101111
C14	3pF	Beijing YN MQ101111
R1	Chip Resistor,9.1ohm	1206
PCB	30Mil RO4350B	



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
2022/11/18	V1.0	Preliminary Datasheet Creation

Application data based on: TC-22-11

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