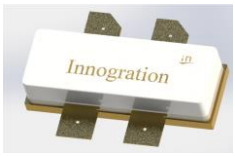
GTAH27200L4 GaN TRANSISTOR

Document Number: GTAH27200L4
Preliminary Datasheet V1.0

GaN 28V 200W, 2.7GHz RF Power Transistor

GTAH27200L4



Description

The GTAH27200L4 is a 200W internally matched, GaN HEMT, designed for multiple applications, up to 2.7GHz. There is no guarantee of performance when this part is used in applications designed outside of these frequencies.

In its typical wideband application like 0.6-2GHz, 1.8-2.7GHz, it can deliver 150W CW

- Typical **CW** performance (on 0.6-2.0GHz fixture with device soldered)：

Vds=28V, Idq=150mA

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Gain(dB)	Eff(%)
600	36.76	52.43	174.98	9.85	15.67	63.45
700	41.49	52.71	186.64	9.1	11.22	73.25
800	37.22	51.83	152.41	7.59	14.61	71.71
900	37.65	51.79	151.01	7.91	14.14	68.18
1000	38.49	51.82	152.05	8.67	13.33	62.64
1100	40.81	52.56	180.30	10.48	11.75	61.44
1200	40.83	52.56	180.30	10.46	11.73	61.56
1300	38.67	52.96	197.70	10.24	14.29	68.95
1400	41.19	52.49	177.42	9.11	11.3	69.55
1500	40.91	52.21	166.34	8.95	11.3	66.38
1600	40.93	52.02	159.22	9.18	11.09	61.94
1700	38.95	52.01	158.85	9.33	13.06	60.81
1800	37.98	52.94	196.79	11.1	14.96	63.32
1900	38	52.69	185.78	9.94	14.69	66.75
2000	38.4	52.15	164.06	8.57	13.75	68.37

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

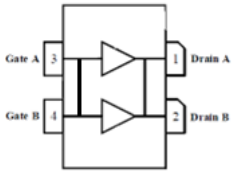
1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



***Notice: Both leads at input and output are internally connected, device is only usable as single ended**

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	32	Vdc
Maximum Forward Gate Current @ Tc = 25°C	Igmax	49	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
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	250	W

Note: 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, RF CW operation，Pout=200W, 2.7GHz	RθJC	0.75	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}=49mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =49mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=150mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

0.6-2.0GHz

Figure 1: Small singal gain and return loss Vs Frequency

Vgs=-2.3V, Vds=28V, Idq=500mA, input power=0dBm

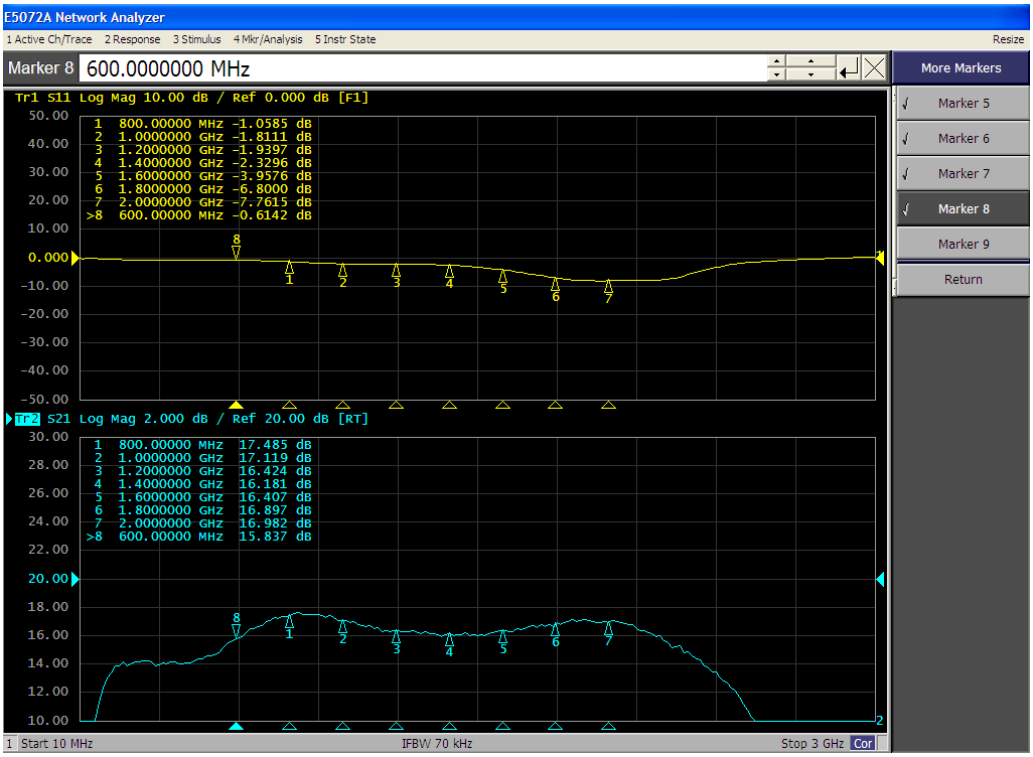
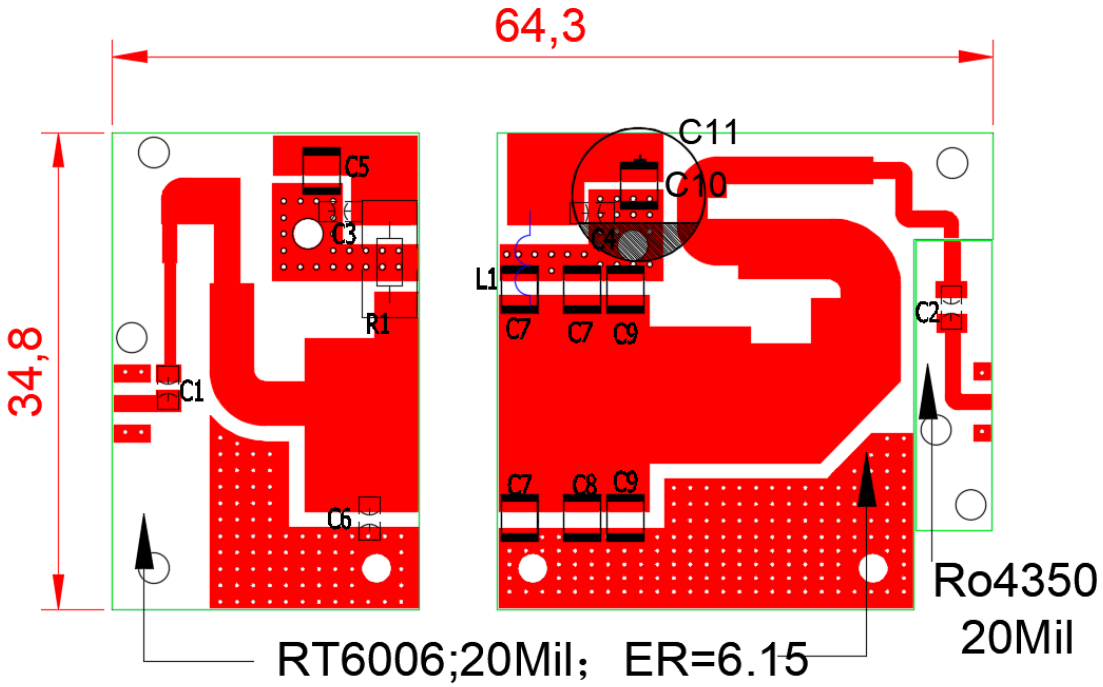


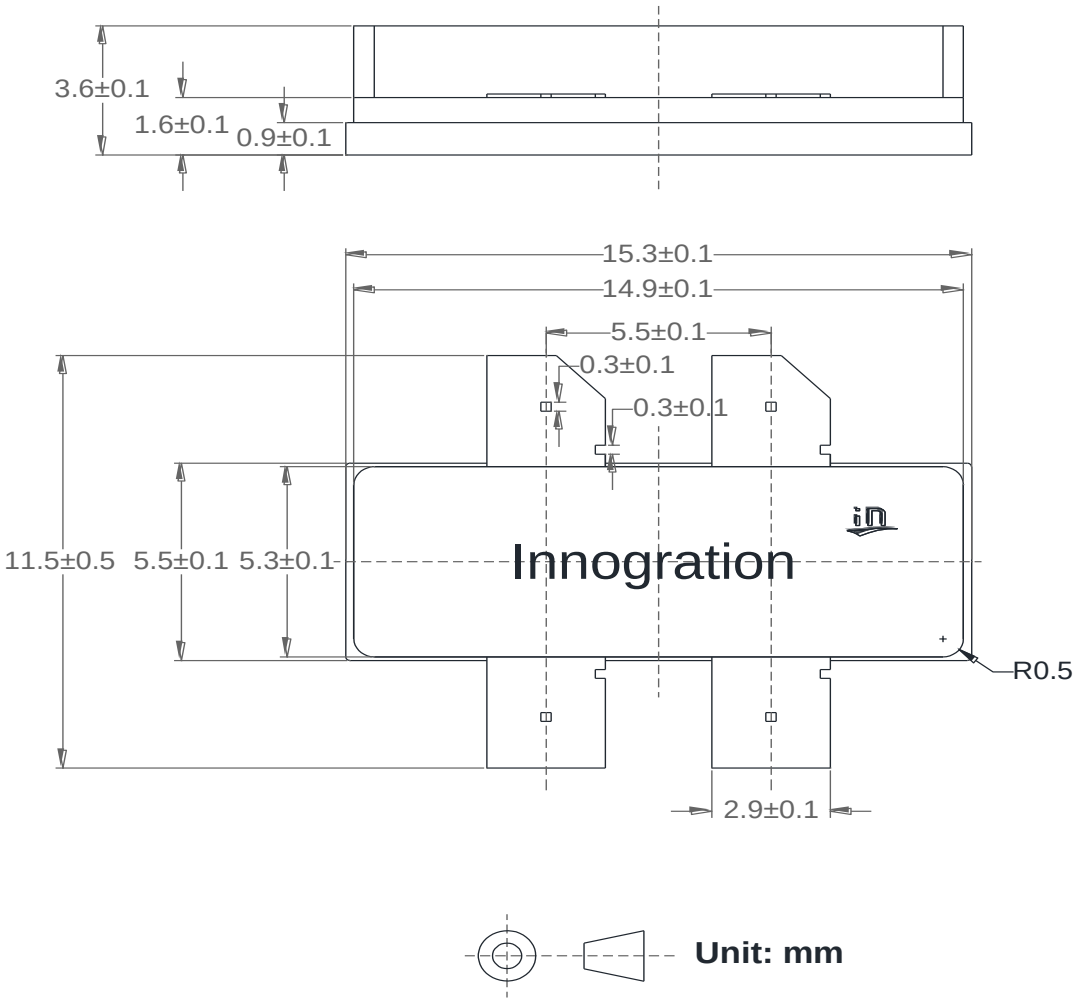
Figure 2: Picture and Bill of materials of 0.8-2GHz wide band application circuit

(Layout Gerber file upon request)



Component	Description	Suggestion
C11	470uF/63V	
C5,C10,	10uF	10uF/100V
C1,C3, C4	18pF	MQ300805
C2	18pF	MQ301111
C6,	1.3pF	MQ300805
C8, C9	0.8pF	MQ301111
C7	1.2pF	MQ301111
L1	1mm wire， 5mm diameter，3turns	DIY
R1	Chip Resistor,100Ω	1812
PCB	RT6006,ER=6.15,20mil / Rogers4350 20mil	

Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/4/17	**V1.0**	**Preliminary Datasheet Creation**

Application data based on YHG-25-16

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