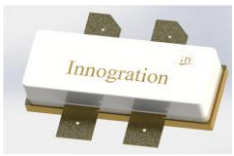
GTAH50080L4 GaN TRANSISTOR

Document Number: GTAH50080L4
Preliminary Datasheet V1.0

Gallium Nitride 28V 80W, C band RF Power Transistor

GTAH50080L4



Description

The GTAH50080L4 is a 80W internally matched, GaN HEMT, designed from 3 to 5GHz, especially 5G NR or LTE application, as well as either Pulse or CW application

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical **CW** performance (on 3-4.9GHz fixture with device soldered)：

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
3000	39	48.04	63.68	4.42	9.04	51.45
3100	39	48.73	74.64	5.02	9.73	53.11
3200	39	48.67	73.62	4.93	9.67	53.33
3300	39	48.7	74.13	5.09	9.7	52.01
3400	39	48.85	76.74	5.19	9.85	52.80
3500	39	48.78	75.51	5.65	9.78	47.73
3600	39	48.96	78.70	5.56	9.96	50.56
3700	39	48.91	77.80	5.49	9.91	50.61
3800	39	48.71	74.30	5.35	9.71	49.60
3900	39	48.58	72.11	5.35	9.58	48.14
4000	39	48.69	73.96	5.59	9.69	47.25
4100	39	48.64	73.11	5.48	9.64	47.65
4200	39	48.58	72.11	5.47	9.58	47.08
4300	39	48.48	70.47	5.32	9.48	47.31
4400	39	48.44	69.82	5.16	9.44	48.33
4500	39	48.24	66.68	5.09	9.24	46.79
4600	39	48.27	67.14	5.19	9.27	46.20
4700	39	48.31	67.76	5.25	9.31	46.10
4800	39	48.35	68.39	5.35	9.35	45.65
4900	39	48.39	69.02	5.46	9.39	45.15

Recommended driver: G2MAH3050-10C9

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

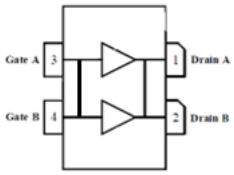
1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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}	36	Vdc
Maximum Forward Gate Current @ Tc = 25°C	Igmax	21.6	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	120	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=80W, 5GHz	RθJC	1.05	C/W

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

DC Characteristics

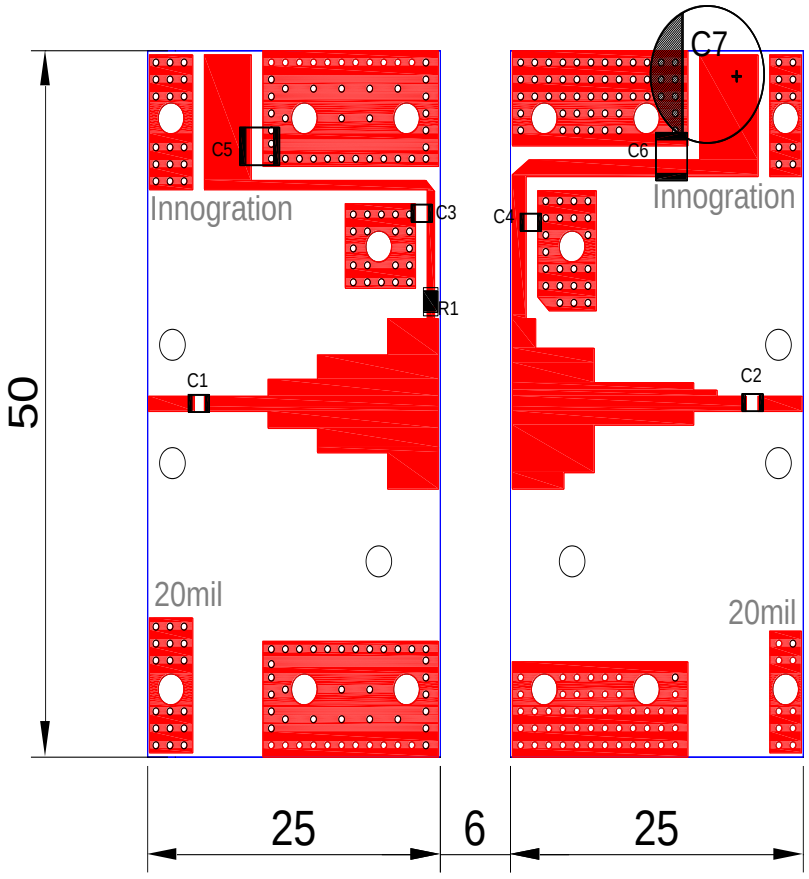
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=21.6mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =21.6mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=40mA, Measured in Functional Test	$V_{GS(Q)}$		-2.6		V

Typical performance

3-4.9GHz

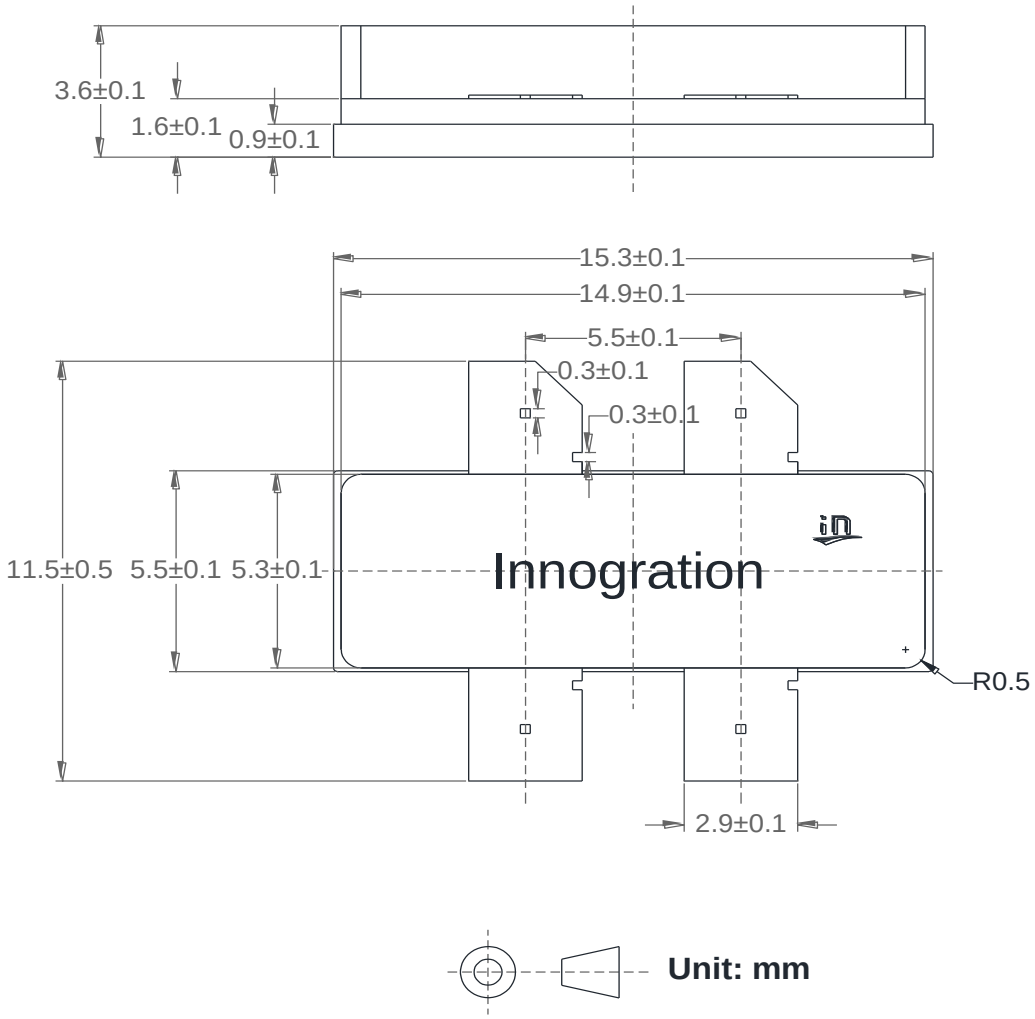
Figure 2: Picture and Bill of materials of wide band application circuit

(Layout Gerber file upon request)



Component	Description	Suggestion
C7	470uF/63V	-
C5,C6	10uF/1210	-
C1,C2，C3,C4	6.2pF/ MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
R1	Chip Resistor ,10Ω/0805	-
PCB	20mil / Rogers 4350 20mil	-

Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2024/9/2	V1.0	Production Datasheet Creation

Application data based on YHG-24-16

Notice

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