

GTAH58070L4 GaN TRANSISTOR

Document Number: GTAH58070L4
Preliminary Datasheet V1.0

Gallium Nitride 28V 70W, C band RF Power Transistor

Description

The GTAH58070L4 is a 70W internally matched, GaN HEMT, designed from 5GHz to 6GHz, 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.

GTAH58070L4



- Typical **CW** performance (on 5.7-5.9GHz fixture with device soldered):

GTAH58070L4V0 Vgs=-2.59V Vds=28V Idq=40mA CW						
Freq (MHz)	Psat (dBm)	Psat (W)	Ids (A)	Pin (dBm)	Gain (dB)	Eff (%)
5700	48.87	77.1	4.99	36.02	12.85	55.17
5750	48.85	76.7	4.86	35.48	13.37	56.39
5800	48.66	73.5	4.70	35.40	13.26	55.81
5850	48.67	73.6	4.60	35.68	12.99	57.16
5900	48.60	72.4	4.58	35.80	12.80	56.49

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

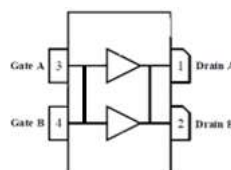
1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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**

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Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum Forward Gate Current @ $T_C = 25^\circ\text{C}$	I_{gmax}	18	mA
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Case Operating Temperature	T_c	+150	$^\circ\text{C}$
Operating Junction Temperature(See note 1)	T_j	+225	$^\circ\text{C}$
Total Device Power Dissipation (Derated above 25°C , see note 2)	P_{diss}	120	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2. Bias Conditions should also satisfy the following expression: $P_{diss} < (T_j - T_c) / R_{JC}$ and $T_c = T_{case}$

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}$, RF CW operation, $P_{out} = 70\text{W}$, 5.8GHz	$R_{\theta JC}$	1	C/W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 18\text{mA}$	V_{DSS}	150			V
Gate Threshold Voltage	$V_{DS} = 28\text{V}$, $I_D = 18\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$, $I_{DS} = 40\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.6		V

Typical performance

5.7-5.9GHz

Figure 1: Small signal gain and return loss Vs Frequency

Vgs=-2.5V, Vds=28V, Idq=100mA, input power=0dBm

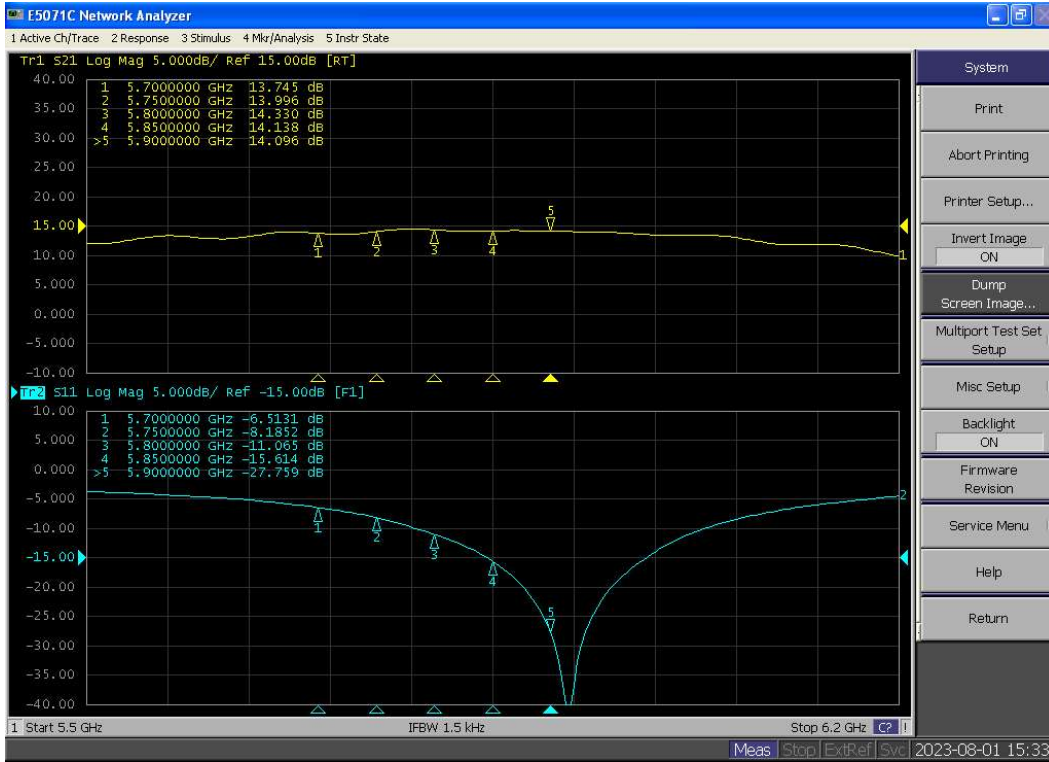
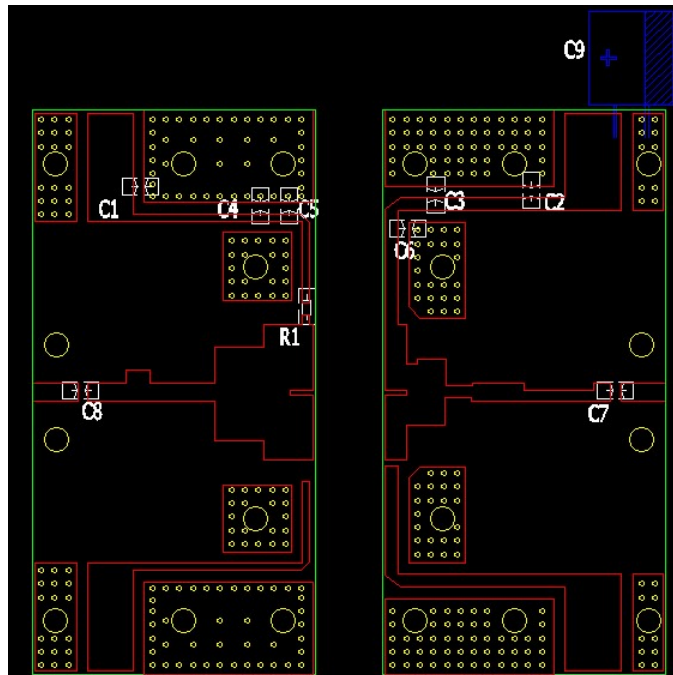


Figure 3: Picture and Bill of materials of 5.7-5.9GHz wide band application circuit
(Layout Gerber file upon request)



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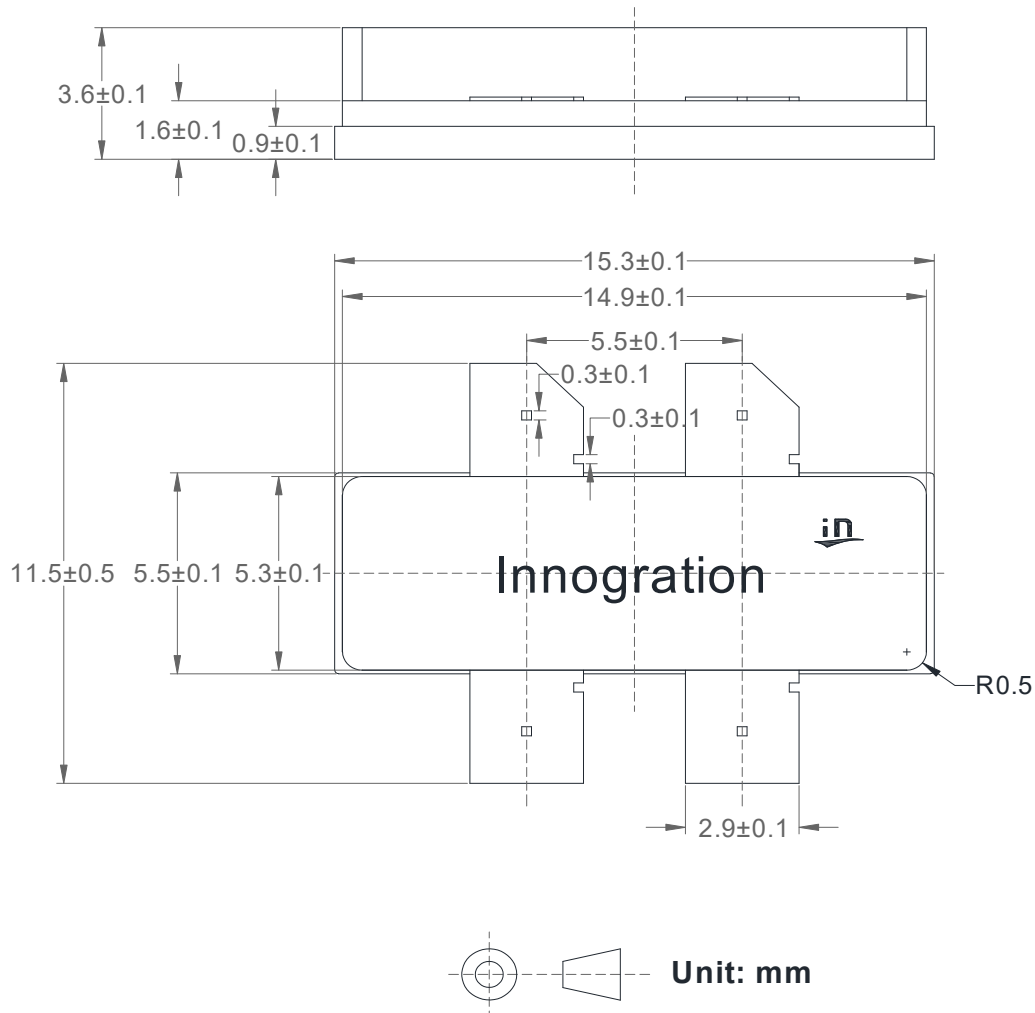
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Component	Description	Suggestion
C1,C2	10uF	10uF/100V
C3	6.2pF	MQ101111
C4	6.8pF	MQ101111
C5,C6	3pF	MQ101111
C7	3pF	0805
C8	4.7pF	0805
C9	470uF/63V	Electrolytic Capacitor
R1	10 Ω	Chip Resistor
PCB	30Mil Rogers4350	

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Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/8/2	V1.0	Production Datasheet Creation

Application data based on TC-23-48

Notice

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