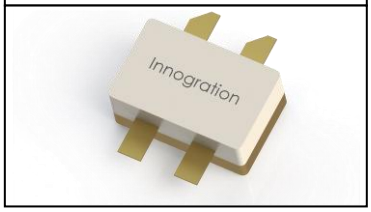
XTAH80010G4 GaN TRANSISTOR

Document Number: XTAH80010G4
Preliminary Datasheet V1.0

Gallium Nitride 28V 10W, 1-8GHz RF Power Transistor

XTAH80010G4



Description

The XTAH80010G4 is a 10W 28V GaN HEMT, implemented with patented match topology at both input and output side, enable extremely wideband applications with frequencies below 8GHz

In typical 1-8G broadband application, It can deliver >8W CW.

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

Please notice this device only makes use of half section of dual-path package, the rest half section is not connected

- Typical performance (on Innogration wide band fixture with device soldered)

Vgs= -2.5V，Vds= 28V，Idq = 50mA，Signal mode ：CW

Freq(GHz)	Pin(dBm)	Pout(dBm)	Pout(W)	Ids(A)	Gain(dB)	Eff(%)	2nd	3rd
1.0	31.4	39.6	9.1	0.61	8.2	53.2	-6.5	-11.4
1.5	32.9	41.8	15.2	0.80	8.9	67.7	-15.0	-15.0
2.0	33.0	41.7	14.8	0.75	8.7	70.4	-17.8	-16.4
2.5	33.1	41.0	12.7	0.71	7.9	63.8		
3.0	33.2	39.9	9.8	0.72	6.7	48.8		
3.5	33.2	40.1	10.1	0.89	6.9	40.6		
4.0	33.3	40.2	10.6	0.90	7.0	41.9		
4.5	33.3	40.9	12.4	1.15	7.7	38.5		
5.0	33.2	41.6	14.4	1.13	8.4	45.6		
5.5	33.2	41.3	13.6	1.10	8.2	44.2		
6.0	33.3	41.3	13.4	1.03	8.0	46.6		
6.5	33.4	40.4	11.0	1.08	7.0	36.3		
7.0	33.4	40.6	11.6	1.09	7.2	37.9		
7.5	33.5	40.7	11.8	1.07	7.2	39.3		
8.0	33.3	39.8	9.5	0.98	6.5	34.6		

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

Table 1. Maximum Ratings (Not simultaneous, TC = 25°C unless otherwise noted)

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	Igmax	2.5	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

1. **Continuous operation at maximum junction temperature will affect MTTF**

Table 2. Thermal Characteristics

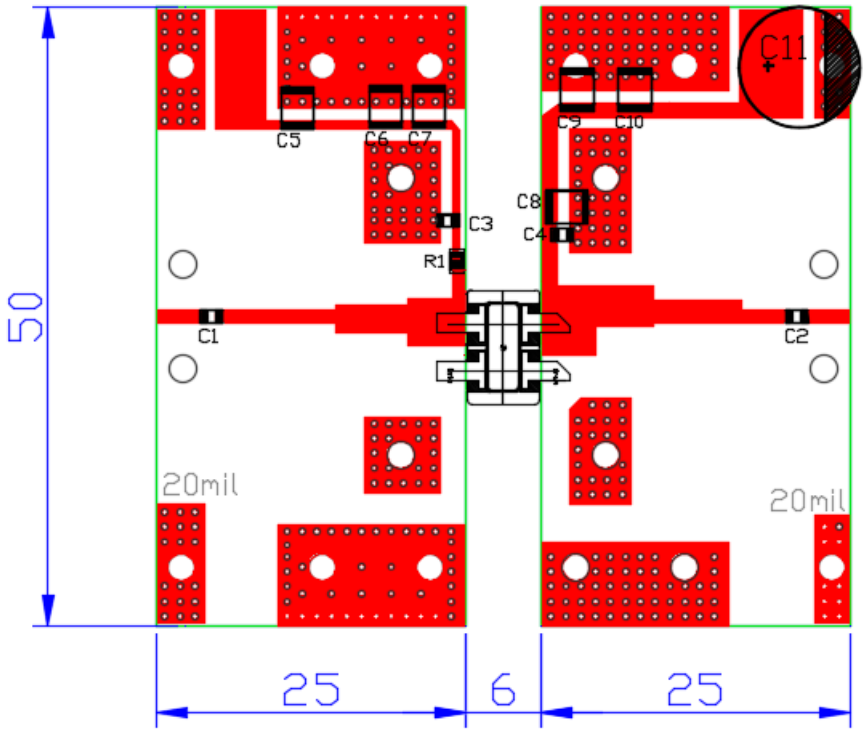
Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 25°C, FEA	$R_{\theta JC-DC}$	7.5	°C/W

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

DC Characteristics

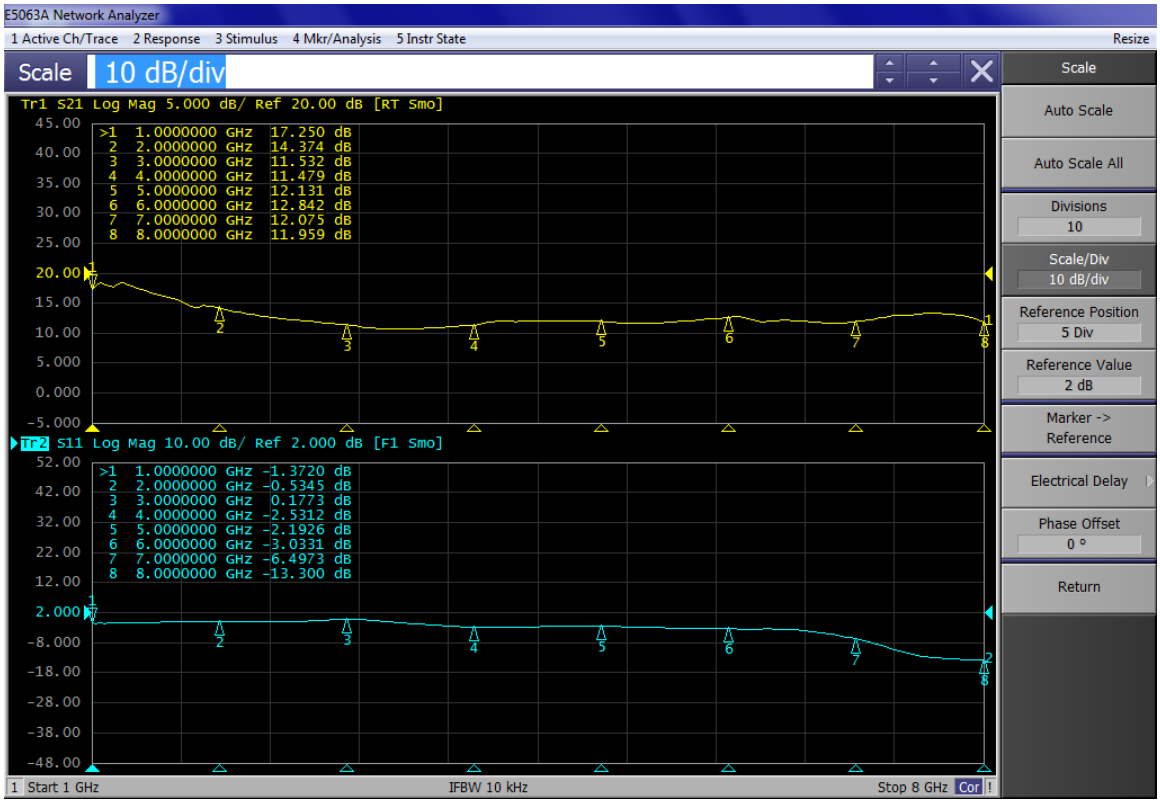
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=2.5mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =2.5mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=50mA, Measured in Functional Test	$V_{GS(Q)}$		-2.5		V

Reference Circuit of Test Fixture Assembly Diagram



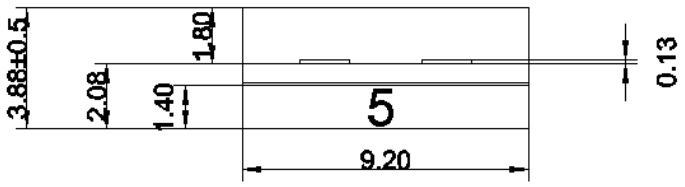
Component	Description	Suggestion
C11	470uF/63V	
C5~C10	10uF	1210
C1	3.9pF	MQ100603
C2	2.4pF	MQ100805
C3，C4	200pF	MQ100805
PCB		Rogers 4350B , Er = 3.48, thickness 20 mils,

Figure 2. Network Analyzer S11/S21 output (Vgs=-2.5V, Vds=28V, Idq=50mA)

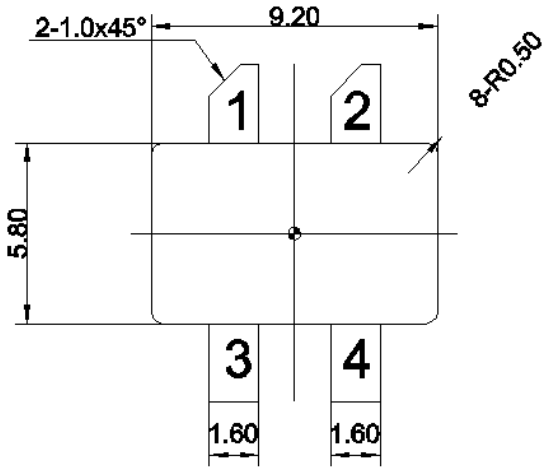


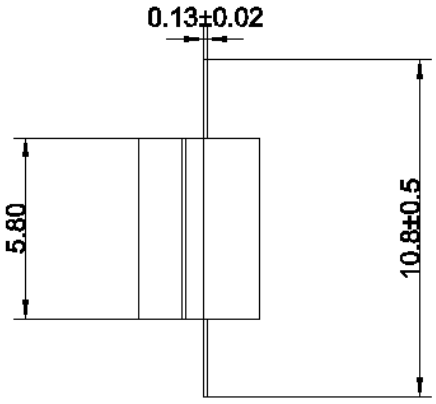
Package Outline

Ceramic package; 4 leads



Pin Connection		
1,2	3,4	5
Drain	Gate	Source





Unit:mm
Tolerances(unless specified): x.x ±0.25
x.xx ±0.13

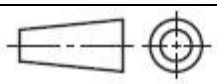
OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-G4					

Figure 1. Package Outline PKG-G4

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/7/15	V1.0	Preliminary datasheet creation

Application data based on YHG-25-23

Notice

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