

GTAH80025GX GaN TRANSISTOR

Document Number: GTAH80025GX
Preliminary Datasheet V1.0

Gallium Nitride 28V 20W, 4-8GHz RF Power Transistor

Description

The GTAH80025GX is a 20W 28V GaN HEMT, implemented with patented match topology at both input and output side, enable extremely wideband applications with frequencies from 4 to 8GHz. It can support CW, and pulse or any modulation format.

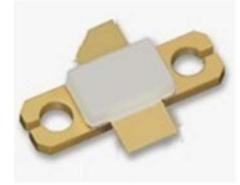
There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

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

Vgs= -2.5V, Vds= 28V, Idq = 100mA, Signal mode : CW

Freq(MHz)	Pin(dBm)	PoutdBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
4000	37.95	43.38	21.78	1.34	5.43	58.04
4100	37.35	43.8	23.99	1.45	6.45	59.08
4200	38.14	44.49	28.12	1.58	6.35	63.56
4300	37.45	44.54	28.44	1.66	7.09	61.20
4400	37.36	44.71	29.58	1.74	7.35	60.71
4500	37.86	44.91	30.97	1.75	7.05	63.21
4600	37.59	44.62	28.97	1.69	7.03	61.23
4700	37.89	44.25	26.61	1.60	6.36	59.39
4800	38.08	44.37	27.35	1.75	6.29	55.82
4900	37.57	44.12	25.82	1.86	6.55	49.58
5000	38.09	44.03	25.29	1.83	5.94	49.36
5100	38.1	44.02	25.23	2.04	5.92	44.18
5200	38	44.18	26.18	2.10	6.18	44.53
5300	38.05	44.03	25.29	2.18	5.98	41.44
5400	38.06	44.18	26.18	2.25	6.12	41.56
5500	37.88	44.02	25.23	2.20	6.14	40.97
5600	37.43	44.36	27.29	2.22	6.93	43.90
5700	36.28	44.25	26.61	2.42	7.97	39.27
5800	37.78	44.04	25.35	2.42	6.26	37.41
5900	37.44	44.62	28.97	2.30	7.18	44.99
6000	37.48	44.56	28.58	2.34	7.08	43.61
6100	37.8	44.86	30.62	2.24	7.06	48.82
6200	37.6	44.66	29.24	2.42	7.06	43.15
6300	37.05	44.56	28.58	2.35	7.51	43.43
6400	37.39	44.49	28.12	2.30	7.1	43.66
6500	37.39	43.91	24.60	2.38	6.52	36.92
6600	38.05	43.87	24.38	2.29	5.82	38.02
6700	37.76	44.06	25.47	2.52	6.3	36.09
6800	37.91	43.56	22.70	2.40	5.65	33.78
6900	37.44	44.14	25.94	2.61	6.7	35.50
7000	37.49	44.21	26.36	2.57	6.72	36.64

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7100	37.47	44.17	26.12	2.53	6.7	36.87
7200	37.06	44.11	25.76	2.52	7.05	36.51
7300	37.52	43.74	23.66	2.41	6.22	35.06
7400	37.04	43.99	25.06	2.55	6.95	35.10
7500	36.99	44.02	25.23	2.52	7.03	35.76
7600	36.08	43.92	24.66	2.45	7.84	35.95
7700	37.07	43.98	25.00	2.57	6.91	34.75
7800	37.16	43.83	24.15	2.58	6.67	33.44
7900	36.56	43.49	22.34	2.37	6.93	33.66
8000	37.34	43.65	23.17	2.44	6.31	33.92

Note: 32V data upon request

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	I _{gmax}	9	mA
Storage Temperature Range	T _{stg}	-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 _{θJC-DC}	2.2	°C/W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} =-8V; I _{DS} =9mA	V _{DSS}	150			V
Gate Threshold Voltage	V _{DS} = 28V, I _D =9mA	V _{GS(th)}		-2.7		V
Gate Quiescent Voltage	V _{DS} =28V, I _{DS} =100mA, Measured in Functional Test	V _{GS(Q)}		-2.5		V

Reference Circuit of Test Fixture Assembly Diagram

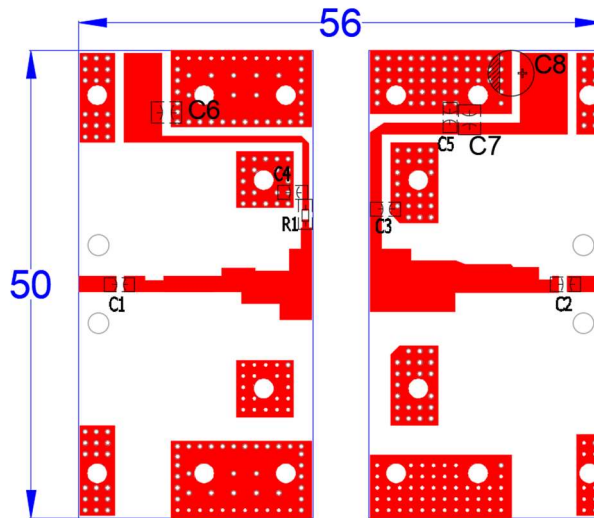
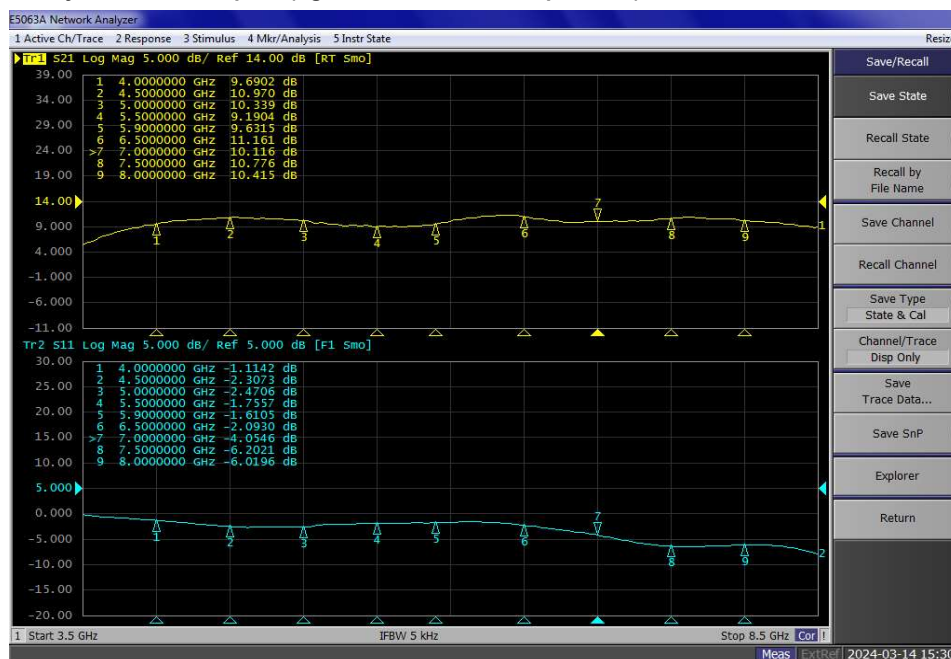


Figure 1. Test Circuit Component Layout (4-8GHz)

Table 4. Test Circuit Component Designations and Values

Component	Description	Suggestion
C8	470uF/63V	
C6,C7	10uF	10uF/100V
C5	100pF	MQ300805
C1	3pF	MQ300805
C2	2.4pF	MQ300805
C3, C4	1.2pF	MQ300805
R1	Chip Resistor,10Ω	0805
PCB	30mil Rogers 4350B	

Figure 2. Network Analyzer S11/S21 output (Vgs=-2.41V, Vds=28V, Idq=200mA)



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Package Outline

Flanged ceramic package; 2 leads

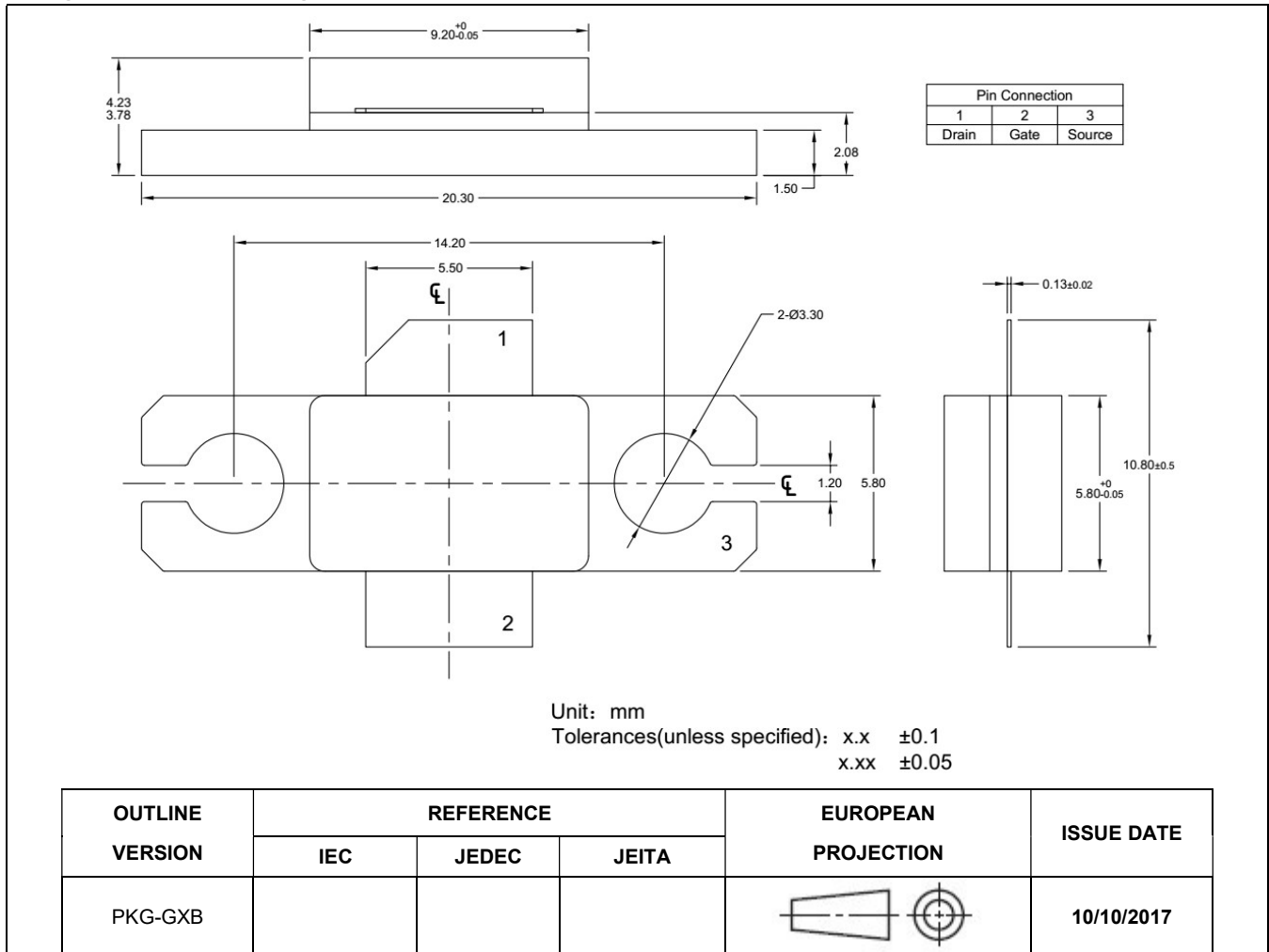


Figure 1. Package Outline PKG-G2E

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/3/14	V1.0	Preliminary datasheet creation due to better performance than NU8004H

Application data based on YHG-24-05

Notice

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