



GaN 28V, 70W, RF Power Transistor

Description

The XTAH42070GX is a 70W internally matched, GaN HEMT, designed for ultrawide RF CW or pulse applications under 4.2GHz. In typical application within 0.4-4GHz, it can deliver >50W CW across the full band

There is no guarantee of performance when it is used in applications designed outside of these frequencies.

- $V_{ds}=28V$, $I_{dq}=100mA$, signal: CW, with device soldered (Data up to 40V upon request)

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
400	30.94	47.56	57.02	3.53	16.62	57.69
600	33.32	48.09	64.42	3.64	14.77	63.20
1000	34.04	48.19	65.92	3.92	14.15	60.06
1500	37.5	48.19	65.92	3.62	10.69	65.03
2000	39.19	47.95	62.37	4.18	8.76	53.29
2500	37.94	48.69	73.96	4.75	10.75	55.61
3000	38.7	47	50.12	5.05	8.3	35.44
3500	39.25	47.61	57.68	4.86	8.36	42.38
4000	38.4	47.5	56.23	4.17	9.1	48.16

XTAH42070GX



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

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current @ $T_c = 25^\circ C$	I_{gmax}	16.8	mA
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ C$
Case Operating Temperature	T_c	+150	$^\circ C$
Operating Junction Temperature(See note 1)	T_j	+225	$^\circ C$

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 $T_C = 85^{\circ}\text{C}$, $T_J = 200^{\circ}\text{C}$, RF CW operation	$R_{\theta JC}$	2.3	C/W

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

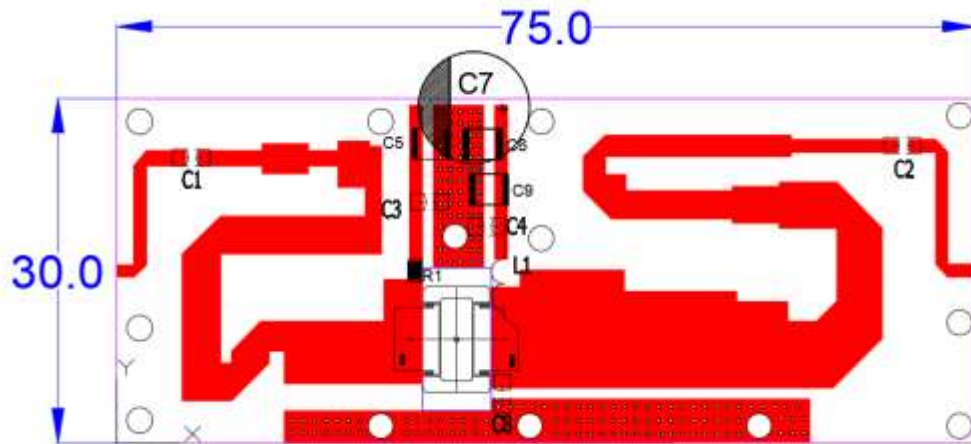
DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 16.8\text{mA}$	V_{DSS}	150			V
Gate Threshold Voltage	$V_{DS} = 28\text{V}$, $I_D = 16.8\text{mA}$	$V_{GS(th)}$	-4	-	-2	V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$, $I_{DS} = 100\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.35		V

Figure 2: Output of network analyzer S11, S21 $V_{GS} = -2.4\text{V}$, $V_{DS} = 32\text{V}$, $I_{DQ} = 130\text{mA}$, input power = 0dBm



Figure 3: Layout info and bill of materials for 0.7-4GHz application circuit



Component	Description	Suggestion
C7	470uF/63V	
C5,C6,C9	10uF	10uF/100V
C1,C2, C3, C4	18pF(MQ300805)	
C8	0.9pF(MQ300805)	
L1	0.5mm wire, 4mm innerdiameter, 3turns	DIY
R1	Chip Resistor,10Ω	0805
PCB	20mil Rogers 4350B	



Package Outline

Flanged ceramic package; 2 leads

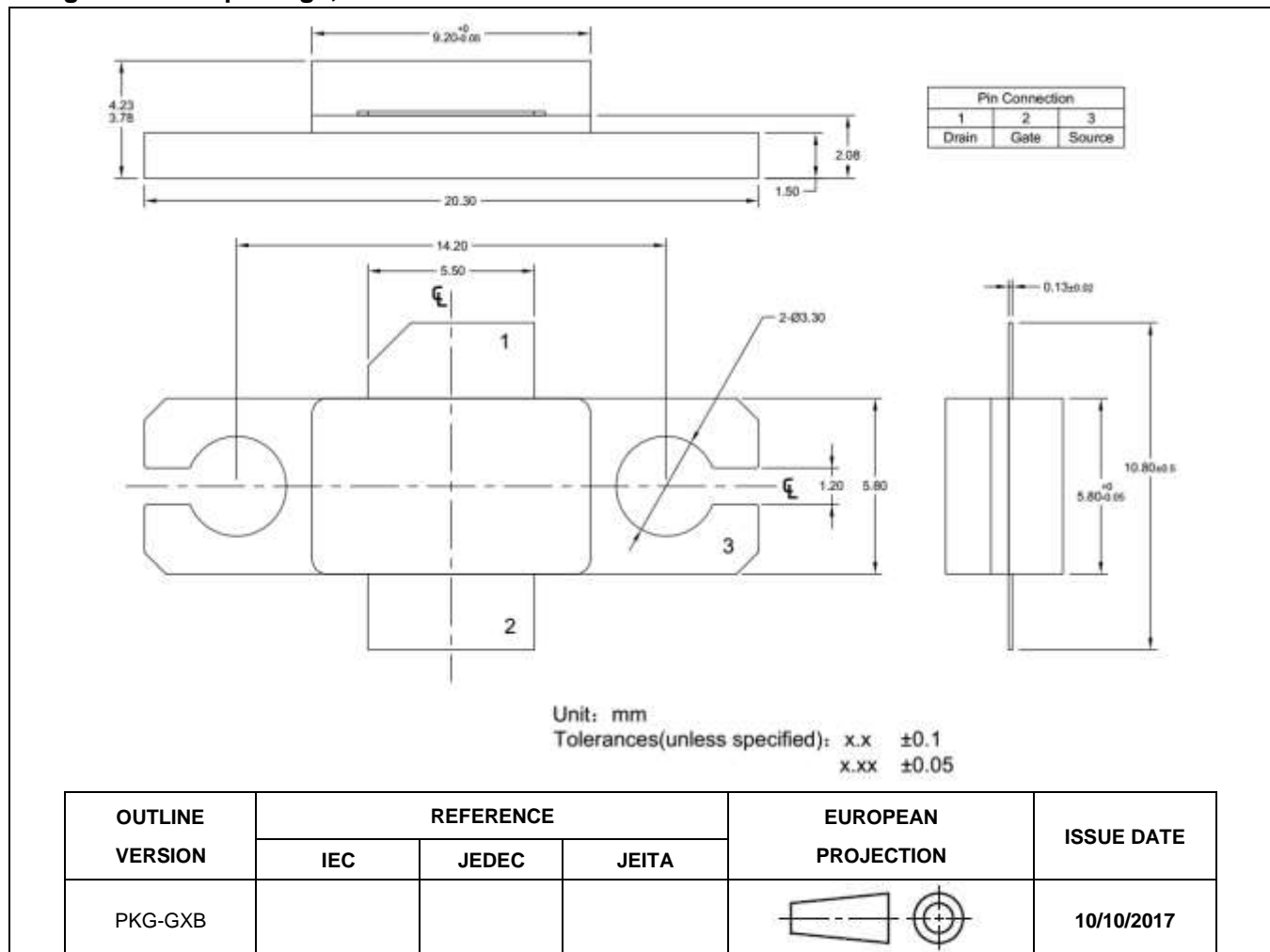


Figure 1. Package Outline PKG-G2E



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/3/28	V1.0	Preliminary Datasheet Creation

Application data based on YHG-25-13

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