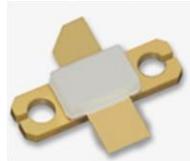


Gallium Nitride 28V 120W, RF Power Transistor

Description

The XTAH30120GX is a 120W internally matched, GaN HEMT, designed for multiple applications up to 3GHz. **In its typical wideband application from 100MHz to 2GHz, it can deliver >60W CW within the full band.**

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

XTAH30120GX

XTAH30120GX V _{gs} =-2.70V V _{ds} =28V I _{dq} =300mA CW								
Freq (MHz)	Pout (dBm)	Pout (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff(%)	2nd (dBc)	3rd (dBc)
100	48.75	75.0	4.11	38.16	10.59	65.16	-12.10	-11.50
200	48.40	69.2	3.35	36.93	11.47	73.76	-16.10	-10.20
300	49.32	85.5	4.66	38.50	10.82	65.53	-10.50	-13.90
400	51.10	128.8	7.88	39.48	11.62	58.39	-11.30	-13.10
500	50.99	125.6	7.65	35.66	15.33	58.64	-8.60	-12.00
600	50.72	118.0	7.43	35.99	14.73	56.74	-12.10	-14.80
700	50.02	100.5	5.29	36.60	13.42	67.82	-10.90	-8.50
800	49.72	93.8	5.07	36.71	13.01	66.04	-14.80	-31.50
900	49.08	80.9	4.27	36.91	12.17	67.67	-13.80	-30.30
1000	49.68	92.9	5.06	36.96	12.72	65.57	-24.20	-15.40
1100	49.72	93.8	5.57	35.85	13.87	60.12	-16.80	-19.10
1200	49.05	80.4	5.67	35.09	13.96	50.61	-29.00	-15.30
1300	50.10	102.3	5.81	36.11	13.99	62.90	-38.20	-38.60
1400	48.95	78.5	3.93	35.65	13.30	71.36	-23.60	-42.00
1500	48.76	75.2	5.08	36.12	12.64	52.84	-9.70	-42.00
1600	48.96	78.7	5.76	37.89	11.07	48.80	-10.60	-25.30
1700	50.37	108.9	8.58	39.16	11.21	45.33	-25.60	-32.00
1800	50.73	118.3	7.80	38.93	11.80	54.17	-18.40	-34.10
1900	50.28	106.7	5.67	37.25	13.03	67.18	-32.70	-39.20
2000	49.98	99.5	5.48	37.86	12.12	64.87	-40.80	-42.30

Recommended driver / predriver: G2MAH0133-12 / I2MEH0145-1

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_{DSS}	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}	27.2	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	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	P_{diss}	125	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 $T_c = 85^\circ\text{C}$, $T_j = 200^\circ\text{C}$, RF CW operation	$R_{\theta JC}$	1.5	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	$V_{GS} = -8\text{V}$; $I_{DS} = 27\text{mA}$	V_{DSS}	150			V
Gate Threshold Voltage	$V_{DS} = 28\text{V}$, $I_D = 27\text{mA}$	$V_{GS(th)}$		-3.0		V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$, $I_{DS} = 30\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.7		V

0.1-2GHz

Figure 1: Output of network analyzer S11, S21

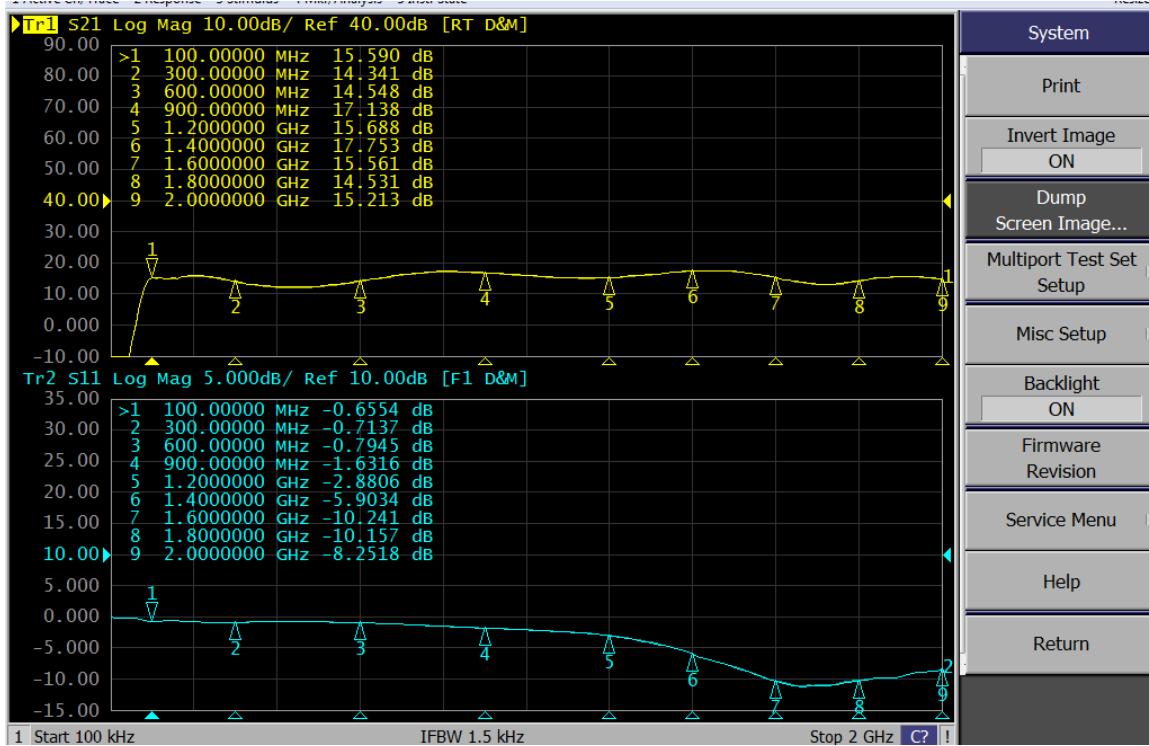
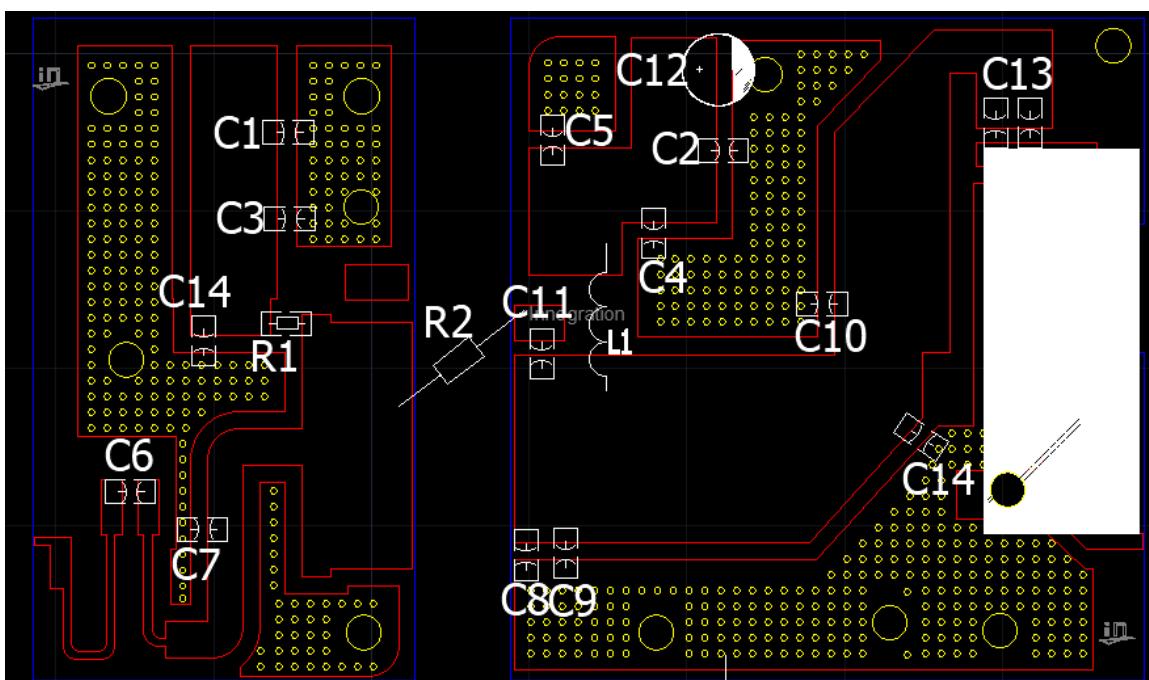


Figure 2: Layout info and bill of materials for 0.1-2GHz application circuit



Package Outline

Flanged ceramic package; 2 leads

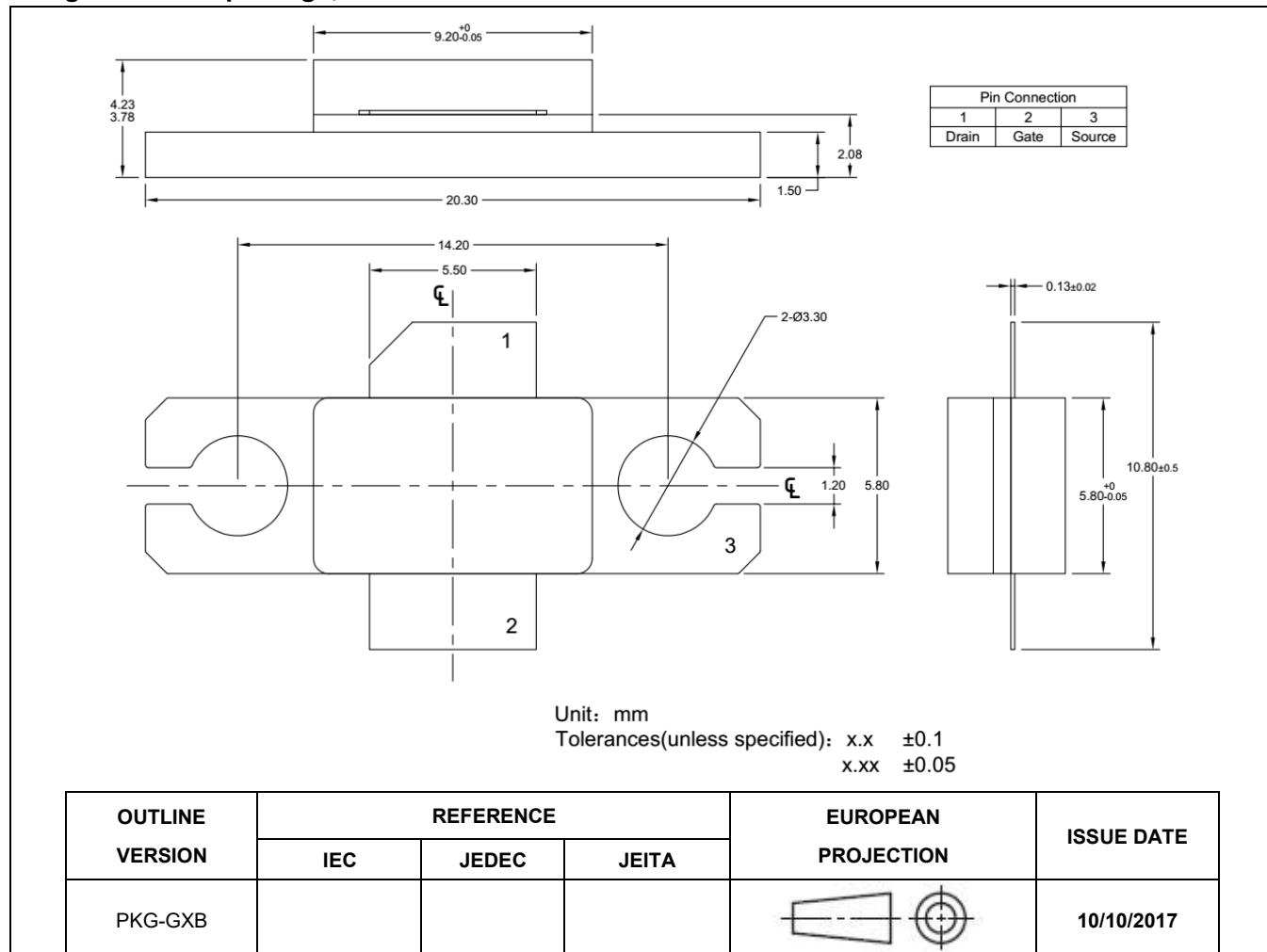


Figure 1. Package Outline PKG-G2E



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/1/4	V1.0	Preliminary Datasheet Creation

Application data based on TC-26-01

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