



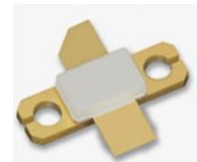
## Gallium Nitride 28V 120W, RF Power Transistor

### 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 Vgs=-2.70V Vds=28V Idq=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	$V_{DS}$	150	Vdc
Gate--Source Voltage	$V_{GS}$	-10,+2	Vdc
Operating Voltage	$V_{DD}$	36	Vdc
Maximum Forward Gate Current @ $T_C = 25^{\circ}\text{C}$	$I_{gmax}$	27.2	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)	$T_J$	+200	$^{\circ}\text{C}$
Total Device Power Dissipation (Derated above $25^{\circ}\text{C}$ , 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

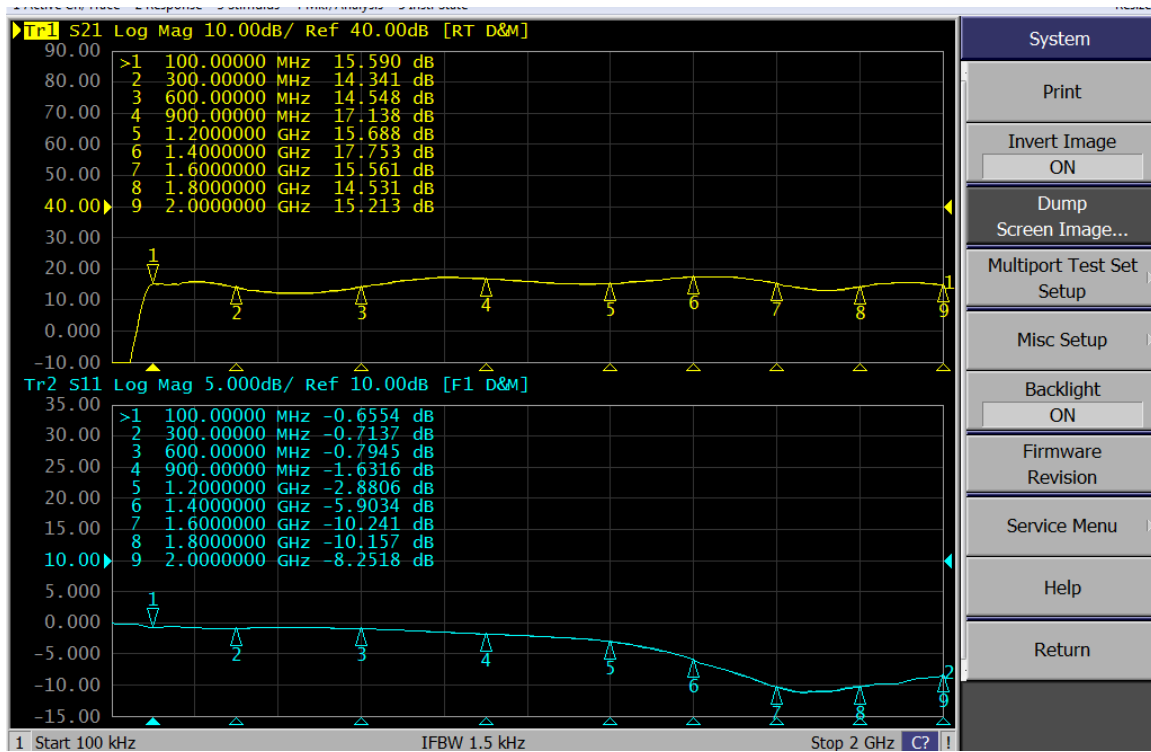
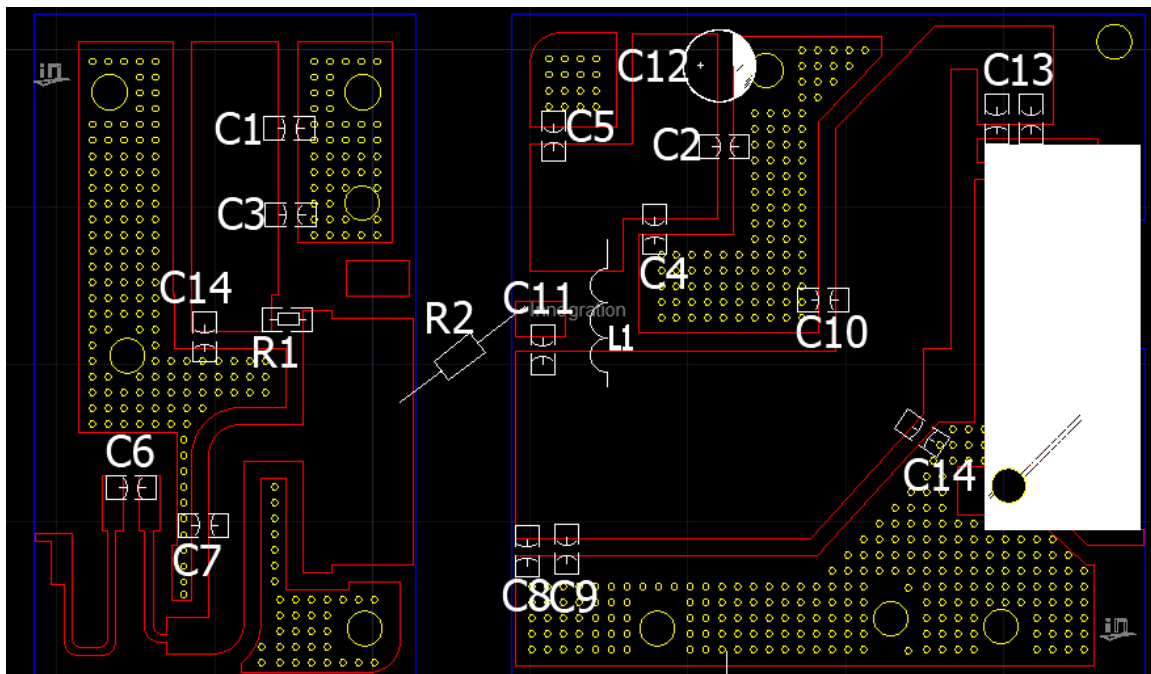


Figure 2: Layout info and bill of materials for 0.1-2GHz application circuit





## Package Outline

### Flanged ceramic package; 2 leads

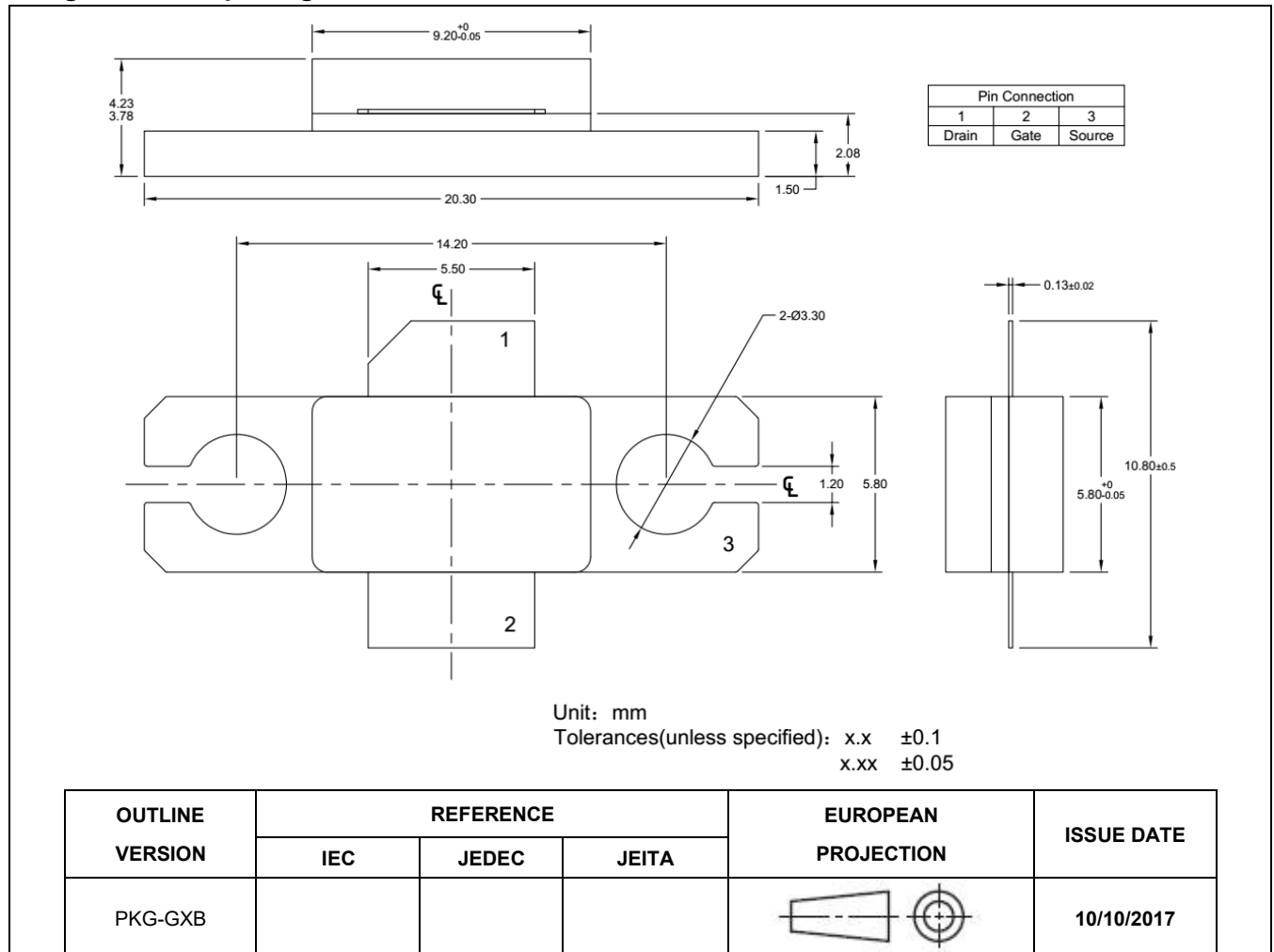


Figure 1. Package Outline PKG-G2E



## 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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