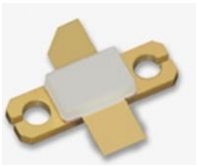
Gallium Nitride 28V 120W, RF Power Transistor

Description

The GTAH09120GX is a 120W, GaN HEMT, designed for multiple applications especially broad band communication applications with frequencies up to 1.8GHz, especially MC-GSM/WCDMA/LTE.

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

GTAH09120GX



•Typical performance (on wide band fixture with device soldered)：

Test signal: WCDMA, 3GPP test model 1; 1 to 64 DPCH; Channel Bandwidth=3.84MHz,PAR =10.5 dB at 0.01 % probability on CCDF.

Frequency (MHz)	V_{DD}=28V I_{DQ}=340mA, P_{AVG}=20W					V_{DD}=28V I_{DQ}=1200mA, P_{AVG}=20W				
	Gp (dB)	η_D (%)	$ACPR_{5MHz}$ (dBc)	CCDF (dB)	P_{peak} (W)	Gp (dB)	η_D (%)	$ACPR_{5MHz}$ (dBc)	CCDF (dB)	P_{peak} (W)
750	18.2	31.2	-29.1	8.6	144	19.0	29.2	-35.4	8.4	139
850	21.0	30.4	-33.3	8.6	145	21.8	28.9	-41.4	8.4	139
950	20.8	37.8	-32.4	8.2	131	21.3	36.1	-37.8	8.1	130

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

V_{DD}=28V I_{DQ}=340mA, CW.

Frequency(MHz)	P_{SAT}(W)	Efficiency (%)
750	122	58.6
850	143	67.6
950	134	80.0

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}	40	Vdc

Maximum Forward Gate Current @ Tc = 25°C	Igmax	27	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_c	+150	°C
Operating Junction Temperature(See not2 1)	T_J	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	125	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2.Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, RF CW operation	RθJC	1.44	C/W

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

DC Characteristics

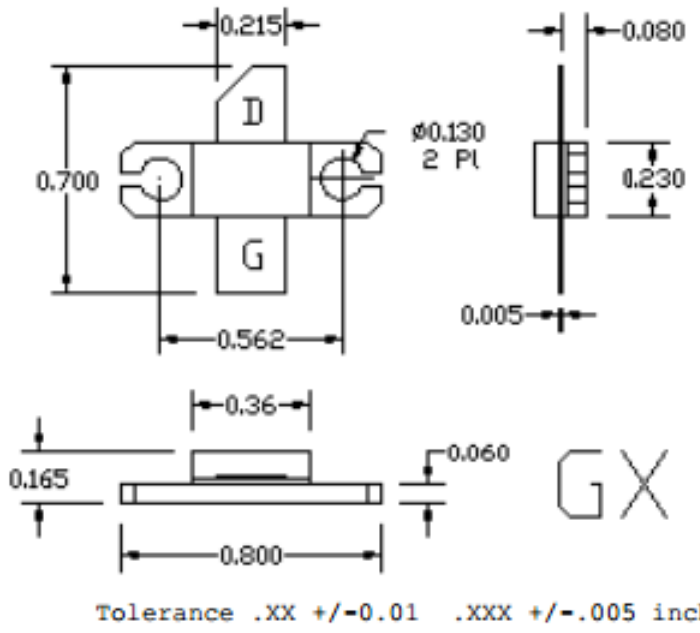
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=27mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 27 mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=1200mA, Measured in Functional Test	$V_{GS(Q)}$		-2.31		V

Functional Tests (In 0.7-1GHz Test Fixture, 50 ohm system) : V_{DD} = 28 Vdc, I_{DQ} = 1200 mA, f = 950 MHz, WCDMA signal, Pout=24W

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		21		dB
Drain Efficiency @ P_{out}	Eff		39		%
Saturated Power by CCDF test	P_{SAT}	120			W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Package Outline

Flanged ceramic package; 2 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-G2E					03/12/2013

Figure 1. Package Outline PKG-G2E

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/6/12	V1.0	Preliminary Datasheet Creation
2017/6/20	V1.1	Maximum rating modified, and function test condition modified
2017/7/27	V1.2	Maximum rating modified, and function test data modified

Notice