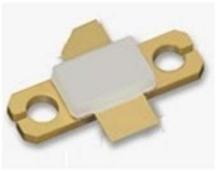
Gallium Nitride 28V 40W,7GHz RF Power Transistor

Description

The GTAH70040GX is a 40W,internally matched GaN HEMT,designed for multiple applications, up to 7GHz, especially for emerging WIFI 6E within 5925 to 7125MHz

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

GTAH70040GX



- Typical performance (on 6.7-7GHz wide band fixture with device soldered)

V_{DD}=28V I_{DQ}=170mA, CW.

Freq(MHz)	Pin(dBm)	Psat(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
6700	37.5	47	50	3.89	9.5	46
6850	37.7	47	50	3.53	9.3	51
7000	38.2	46.3	43	3.19	8.1	48

V_{DD}=32V I_{DQ}=170mA, CW.

Freq(MHz)	Pin(dBm)	Psat(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
6700	37.5	47.5	56	4.04	10	43
6850	37.8	47.6	58	3.73	9.8	48
7000	38.4	47.1	51	3.33	8.7	48

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
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+220	°C

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	$R_{\theta JC}$	2.4	C/W

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

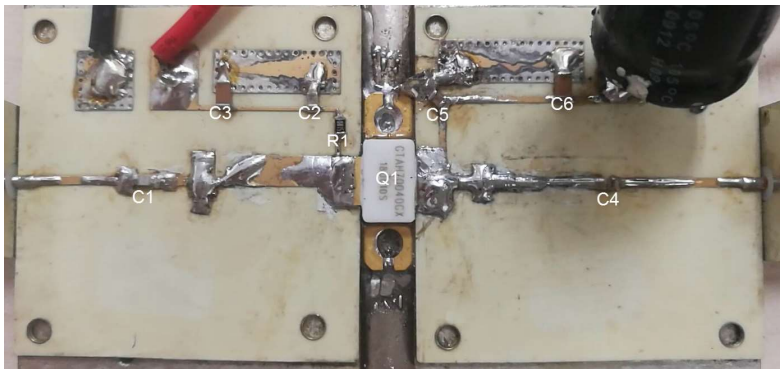
DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=12mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 12mA	V_{GS}(th)		-2.75		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=170mA, Measured in Functional Test	$V_{GS(Q)}$		-2.34		V

Functional Tests (In Test Fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 110 mA, f =7000 MHz, CW.

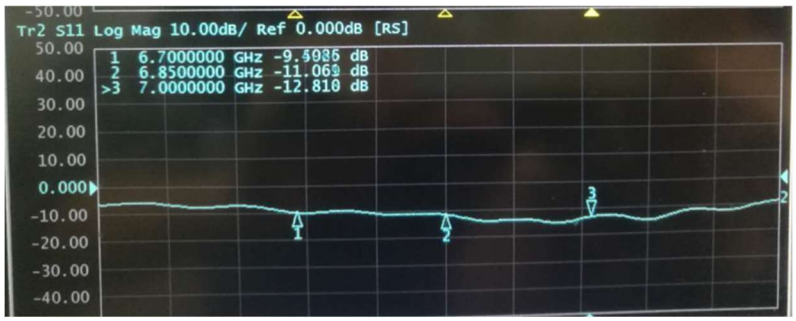
Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		8.5		dB
Drain Efficiency @ POUT	Eff		48		%
Output Power	P_{OUT}		42		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Figure 1: Photo of test fixture and bill of materials (Rogers RO4350B , Thickness 20Mils PCB layout upon request)



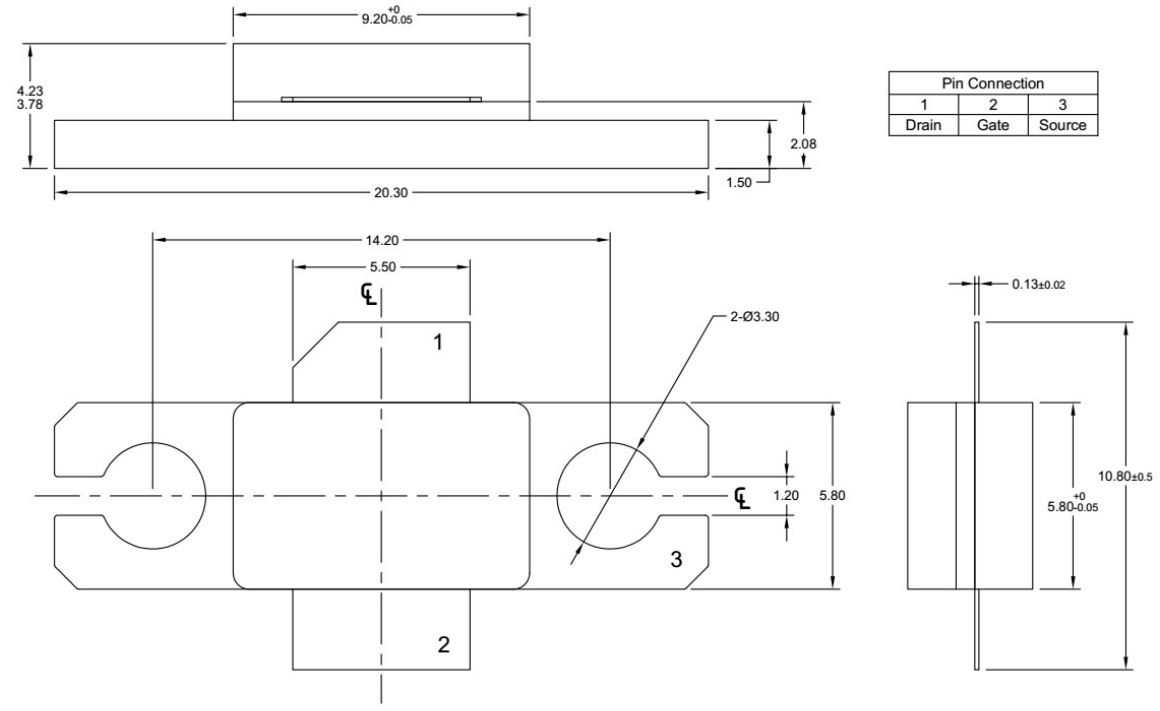
C1	2PF	ATC600F
C2,C5	3.3PF	ATC600F
C3,C6	10UF	10UF/50V
C4	4.7PF	ATC600F
R1	25 Ω	0805
Q1	GTAH70040GX	180610S

Figure 2: Network analyzer output S11



Package Outline

Flanged ceramic package; 2 leads



Unit: mm
Tolerances(unless specified): x.x ±0.1
x.xx ±0.05

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-GXB					10/10/2017

Figure 1. Package Outline PKG-G2E

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2018/3/2	V1.0	Preliminary Datasheet Creation
2021/1/4	V1.1	Add application data

Application data based on ZL-18-09

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