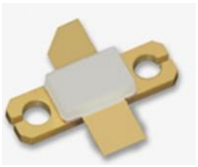
Gallium Nitride 28V 120W, RF Power Transistor

Description

The GTAH30110GX is a 110W internally matched, GaN HEMT, designed for multiple applications, from 0.5GHz up to 3GHz

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

GTAH30110GX



- Typical performance (on 0.5-2.5GHz wideband fixture with device soldered)：

V_{DD}=32V I_{DQ}=900mA, Test signal:CW, Tc=25 degree C

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
500	35.2	49.7	93	4.61	14.5	63
600	37.1	49.5	89	3.83	12.4	73
700	38.3	49	79	3.42	10.7	73
800	33.8	49	79	3.66	15.2	68
900	36.1	49.4	87	4.21	13.3	65
1000	36.1	49.4	87	4.1	13.3	66
1100	36.2	48.9	78	3.86	12.7	63
1200	36.2	49.1	81	4.26	12.9	60
1300	37.1	49.5	89	4.47	12.4	62
1400	37.2	50.1	102	5.53	12.9	58
1500	37.1	50	100	4.5	12.9	69
1600	37.3	49.4	87	4.2	12.1	65
1700	37.1	49.1	81	4.14	12	61
1800	38.1	48.6	72	4.41	10.5	51
1900	37.7	48.6	72	5.06	10.9	45
2000	37	48.9	78	5.33	11.9	46
2100	37	49.4	87	4.99	12.4	55
2200	37.8	48.8	76	4.39	11	54
2300	38.1	48.6	72	4.86	10.5	47
2400	36.8	49.1	81	5.33	12.3	48
2500	36	49.1	81	4.97	13.1	51

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	24.5	mA
Storage Temperature Range	Tstg	-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)	Pdiss	100	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	1.75	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}=24.5mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =24.5mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=200mA, Measured in Functional Test	$V_{GS(Q)}$		-2.3		V

Figure 1: Small singal gain and return loss Vs Frequency

Vgs=-2.3V, Vds=28V, Idq=200mA, input power=0dBm

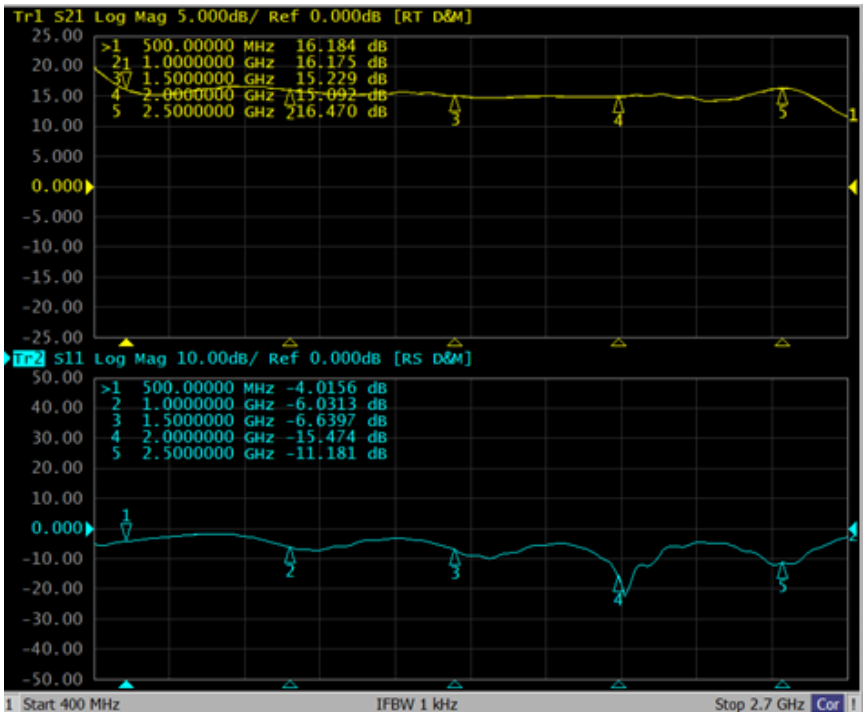
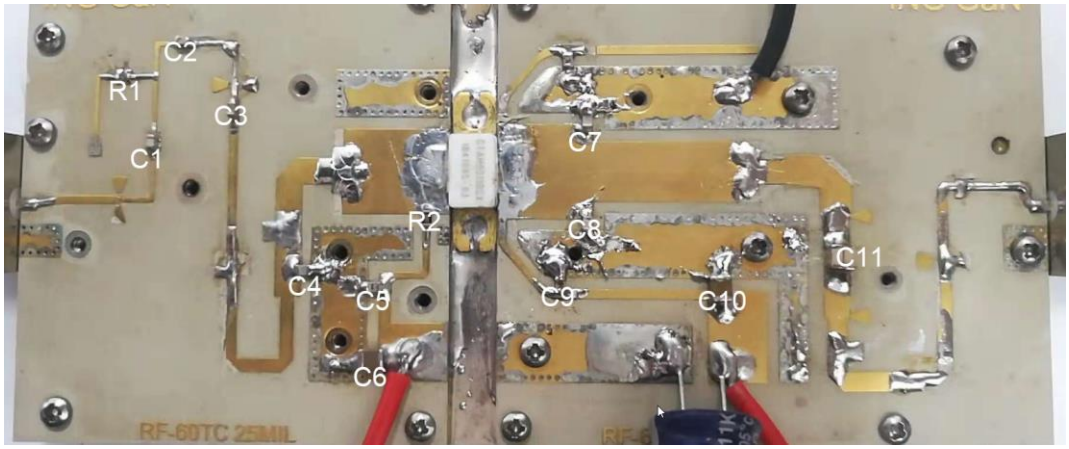


Figure 2: Photo and Bill of materials of 0.5-2.5GHz wide band application circuit



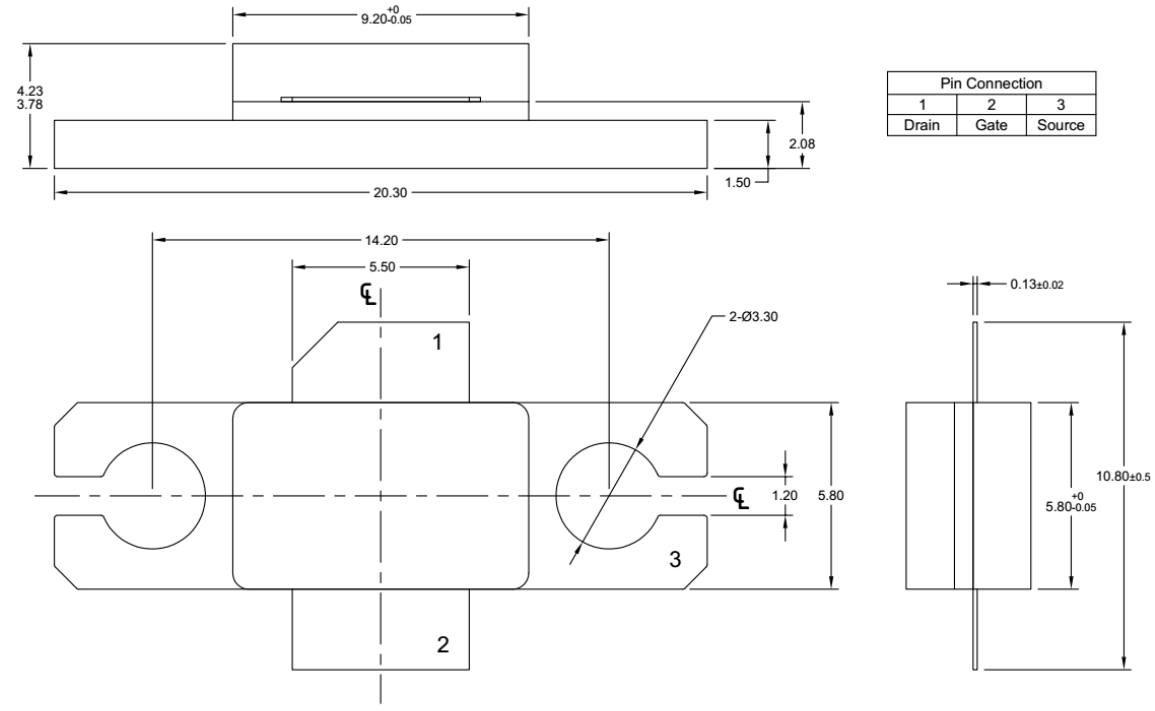
PCB:RF-60TC 25mil(Layout Gerber file upon request)

Bill of materials

Part	description	Model
C1,C2	22PF	ATC600F
C3,C5,C9	33PF	ATC600F
C4,C7,C8	0.5PF	ATC600F
C11	24PF*2	ATC800B
C6,C10	10UF	10UF/50V
R1	220Ω	0603
R2	20Ω	0603

Package Outline

Flanged ceramic package; 2 leads



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
2018/10/30	**V1.0**	**Preliminary Datasheet Creation**

Notice