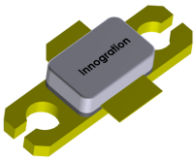
Gallium Nitride 28V 45W, RF Power Transistor

STAH70045GX



Description

The STAH70045GX is a 45W internally matched, GaN HEMT, designed from 6.0 to 7.0GHz, especially 5G NR or LTE application, as well as either Pulse or CW application

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

•Typical performance (on broadband fixture with device soldered)

V_{DD}=28V I_{DQ}=100mA, CW

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
5900	40.8	47.37	54.58	3.84	6.57	50.76
6100	41	47.87	61.24	4.04	6.87	54.13
6300	40.4	47.62	57.81	3.96	7.22	52.14
6500	40.6	47.35	54.33	3.7	6.75	52.44
6700	39.9	47.24	52.97	3.69	7.34	51.26
6900	39.5	46.98	49.89	3.41	7.48	52.25
7100	40.4	46.58	45.50	3.22	6.18	50.46

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°C	Igmax	12.6	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	+225	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	75	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	$R_{\theta JC}$	1.8	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}=12.6mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =12.6mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.16		V

Typical performance

5.9-7.1GHz

Figure 2: Small singal gain and return loss Vs Frequency

Vds=28V, Idq=100mA, input power=0dBm

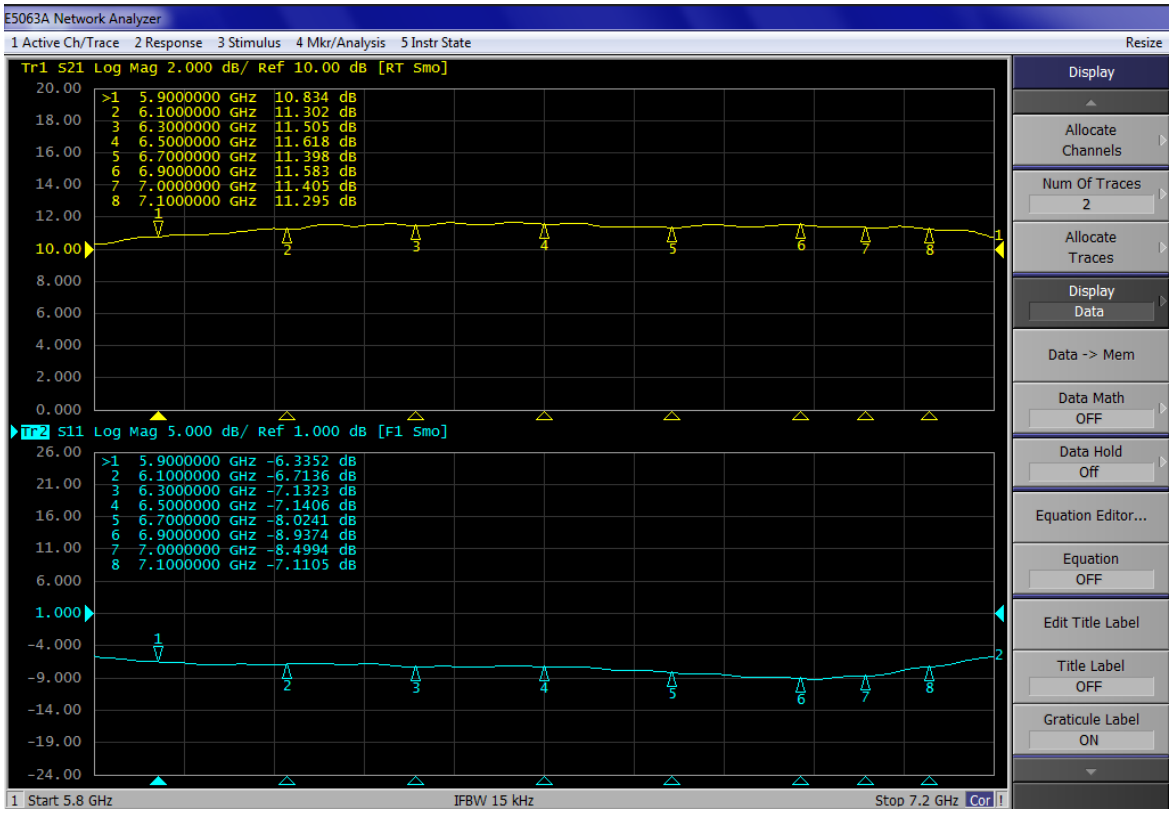
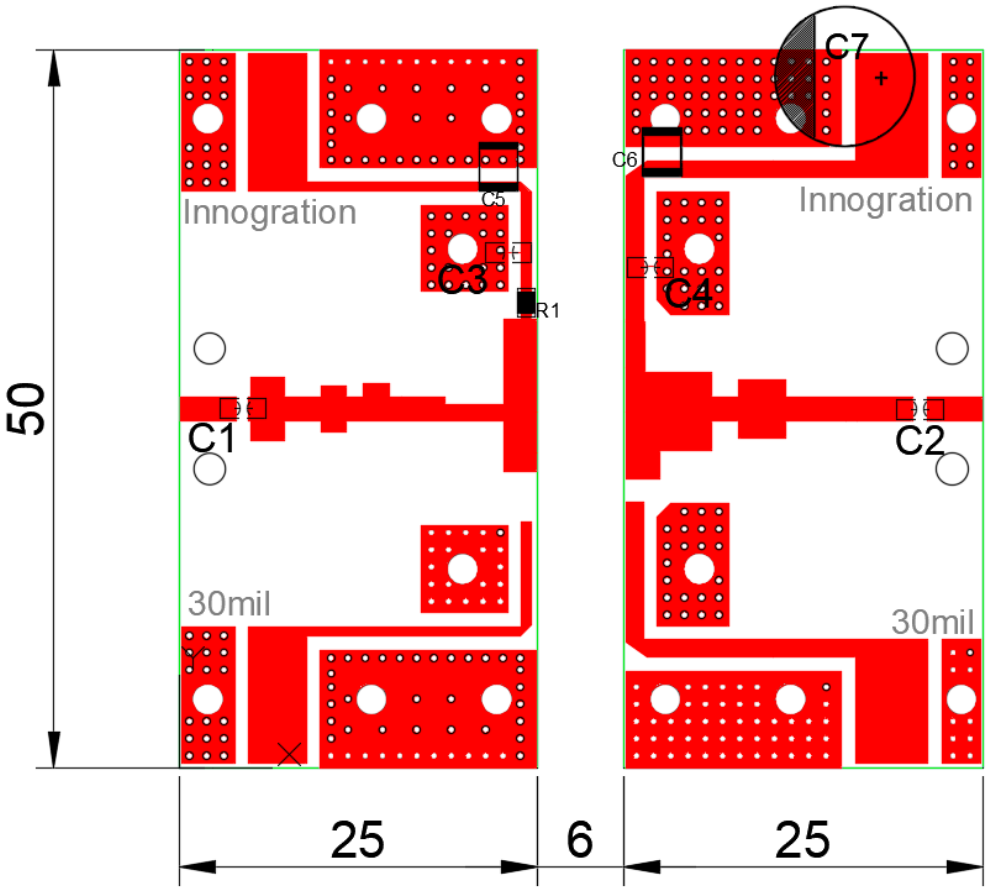


Figure 3: Picture and Bill of materials of 5.9-7.1GHz wide band application circuit

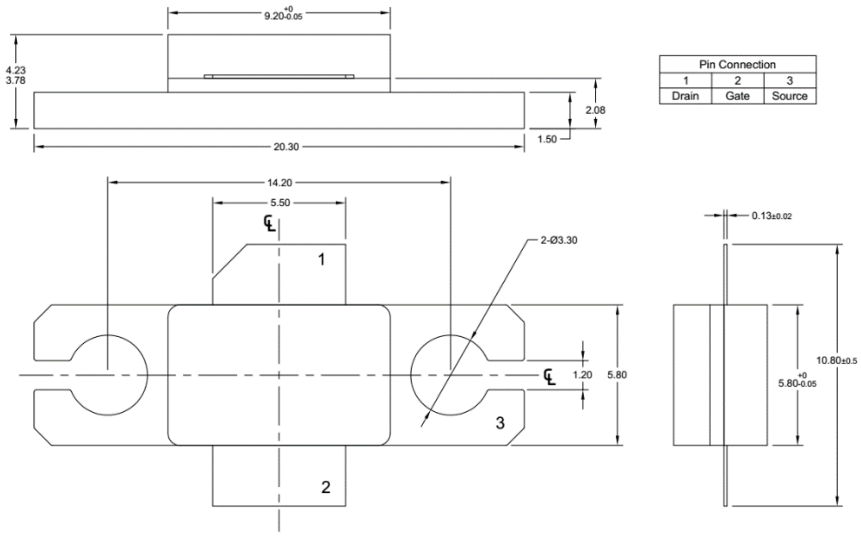
(Layout Gerber file upon request)



Component	Description	Suggestion
C7	470uF/63V	-
C5,C6	10uF/1210	-
C1、C2、C3、C4	3pF/ MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
R1	Chip Resistor ,10Ω/0805	-
PCB	30mil / Rogers 4350 30mil	-

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 5. Document revision history

Date	Revision	Datasheet Status
2025/1/9	**V1.0**	**Preliminary Datasheet Creation**

Application data based on YHG-25-01

Notice