



# GaN HEMT 50V, 150W, 5.8GHz RF Power Transistor

**STCV58150F4C**

## Description

The STCV58150F4C is a single ended 150watt, GaN HEMT, ideal for ISM applications at 5.8GHz.

It can support CW, pulse and linear applications.

There is no guarantee of performance when this part is used outside of stated frequencies.

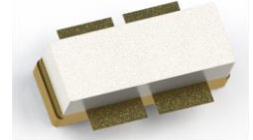
- Typical pulse CW performance across the band with device soldered

$V_{DD} = 50\text{ Vdc}$ ,  $I_{dq} = 20\text{ mA}$   $T_c = 25^\circ\text{C}$ , air cooling

CW:

Freq (GHz)	Psat (dBm)	Psat (W)	Psat Eff(%)	Power Gain(dB)
5.8	52.33	171	55	10.5

Recommended driver: STAV58030J2, and 5.7-5.9G data upon request



## Applications

- C band Class AB power amplifier
- 5.8GHz RF Energy

## 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
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	$V_{DSS}$	+200	Vdc
Gate--Source Voltage	$V_{GS}$	-8 to +0.5	Vdc
Operating Voltage	$V_{DD}$	55	Vdc
Maximum gate current	$I_{GS}$	21	mA
Storage Temperature Range	$T_{stg}$	-65 to +150	°C
Case Operating Temperature	$T_c$	+150	°C
Operating Junction Temperature	$T_j$	+225	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA $T_c = 25^\circ\text{C}$ , at $P_d = 140\text{ W}$ at 5.8GHz	$R_{\theta JC}$	0.85	°C /W

**Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)**

### DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{ V}$ ; $I_{DS} = 21\text{ mA}$	$V_{DSS}$		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{ V}$ , $I_D = 21\text{ mA}$	$V_{GS(th)}$	-4	-	-2	V



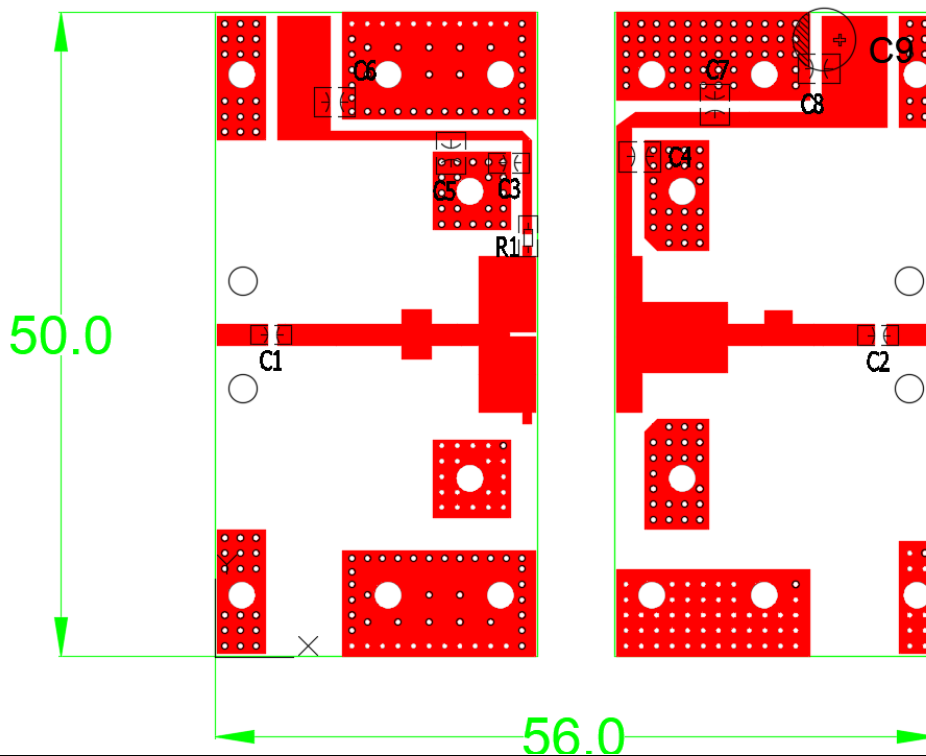
Gate Quiescent Voltage	VDS =50V, IDS=20mA, Measured in Functional Test	V <sub>GS(Q)</sub>		--3.1		V
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**Ruggedness Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	5.8GHz, Pout=150W pulse CW All phase, No device damages	VSWR		10:1		

**Reference Circuit of Test Fixture Assembly Diagram**

PCB materials: Ro4350B , DXF file upon request



Component	Description	Suggestion
C9	470uF/63V	
C5,C6,C7,C8	10uF	10uF/100V
C1, C3,	3.9pF( MQ300805)	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD
C2 ,C4	3.9pF( MQ301111)	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD
R1	Chip Resistor,10Ω	0805
PCB	30mil Rogers 4350B	



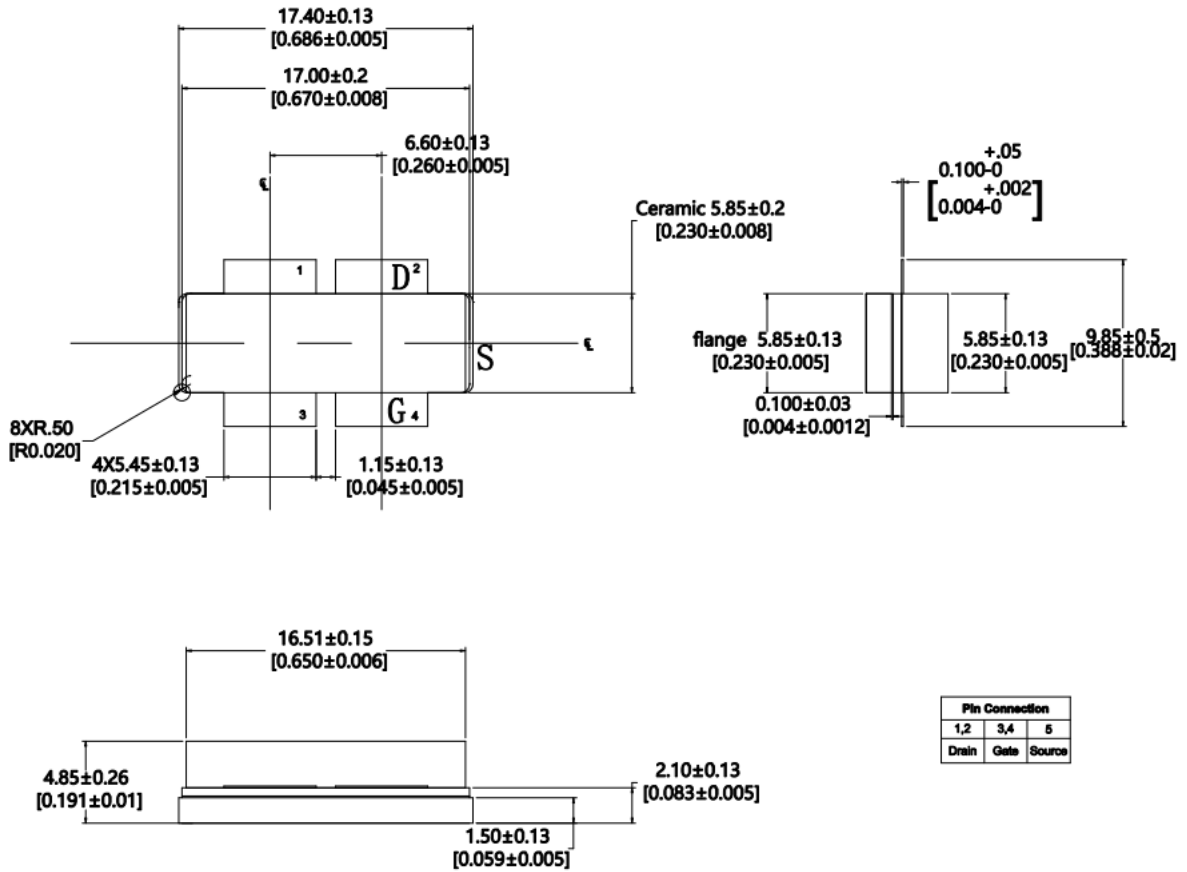
Figure 4: S11/S21 output from Network analyser (VDS= 50V, IDQ=200 mA Vgs =-3.0V)





Package Outline

Flangeless ceramic package; 4 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-LBS					07/31/2023



## Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2024/10/12	V1.0	Preliminary Datasheet Creation

Application data based on: YHG-24-18

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