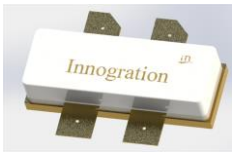
GaN HEMT 50V, 150W,6-8GHz RF Power Transistor

STCV75W125L4



Description

The STCV75W125L4 is a 150watt, single ended, GaN HEMT, ideal for applications from 6 to 8GHz.

It is housed in 15*5.5mm ceramic package with high thermally conductive flange.

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

- Typical RF performance on application board with device soldered

  VDS = 50 V, IDQ = 100 mA, 1ms,10%

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	Ids(A)	Gain(dB)	Eff (%)
6400	44.00	52.30	169.8	2.47	8.3	45.8
6500	44.00	52.30	169.8	2.57	8.3	44.1
6600	44.00	52.40	173.8	2.67	8.4	43.4
6700	44.00	52.60	182.0	2.75	8.6	44.1
6800	44.00	52.80	190.5	2.73	8.8	46.5
6900	44.00	52.80	190.5	2.69	8.8	47.2
7000	44.00	52.90	195.0	2.65	8.9	49.1
7100	44.00	52.80	190.5	2.52	8.8	50.4
7200	44.00	52.40	173.8	2.37	8.4	48.9

CW at 44V can reach 120W

Applications

- C band power amplifier application
- 5G Advanced PA

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

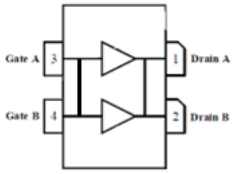
1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



***Notice: Both leads at input and output are internally connected, device is only usable as single ended**

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	Igs	21	mA
Storage Temperature Range	Tstg	-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°C, at Pout=150W Pulsed	RθJC	0.8	°C /W

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

DC Characteristics (main path, measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=21mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 21mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =50V, IDS=500mA, Measured in Functional Test	$V_{GS(Q)}$		-3.24		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	7GHz, Pout=150W Pulsed on All phase, No device damages	VSWR		10:1		

6.4-7.2GHz

Figure 4: Network analyzer output, S11 and S21

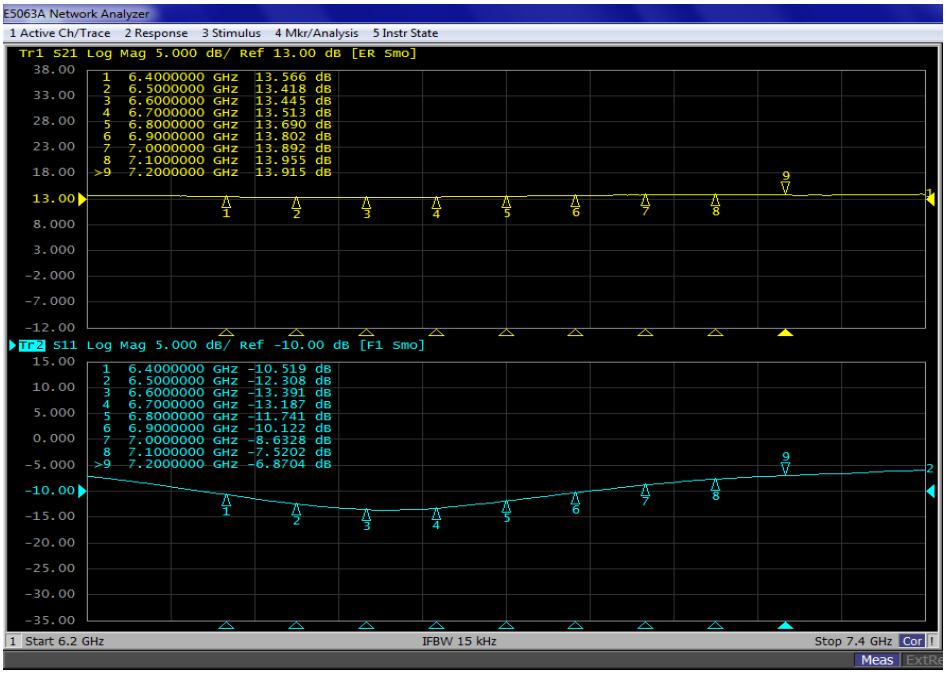


Figure 5: Picture of application board circuit

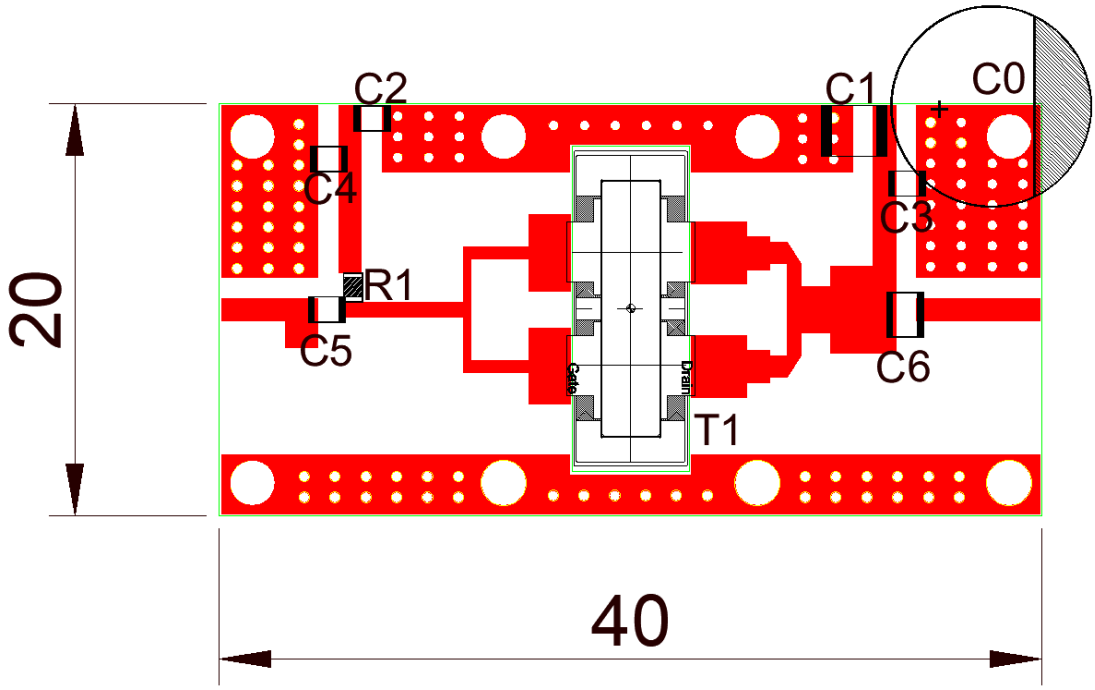
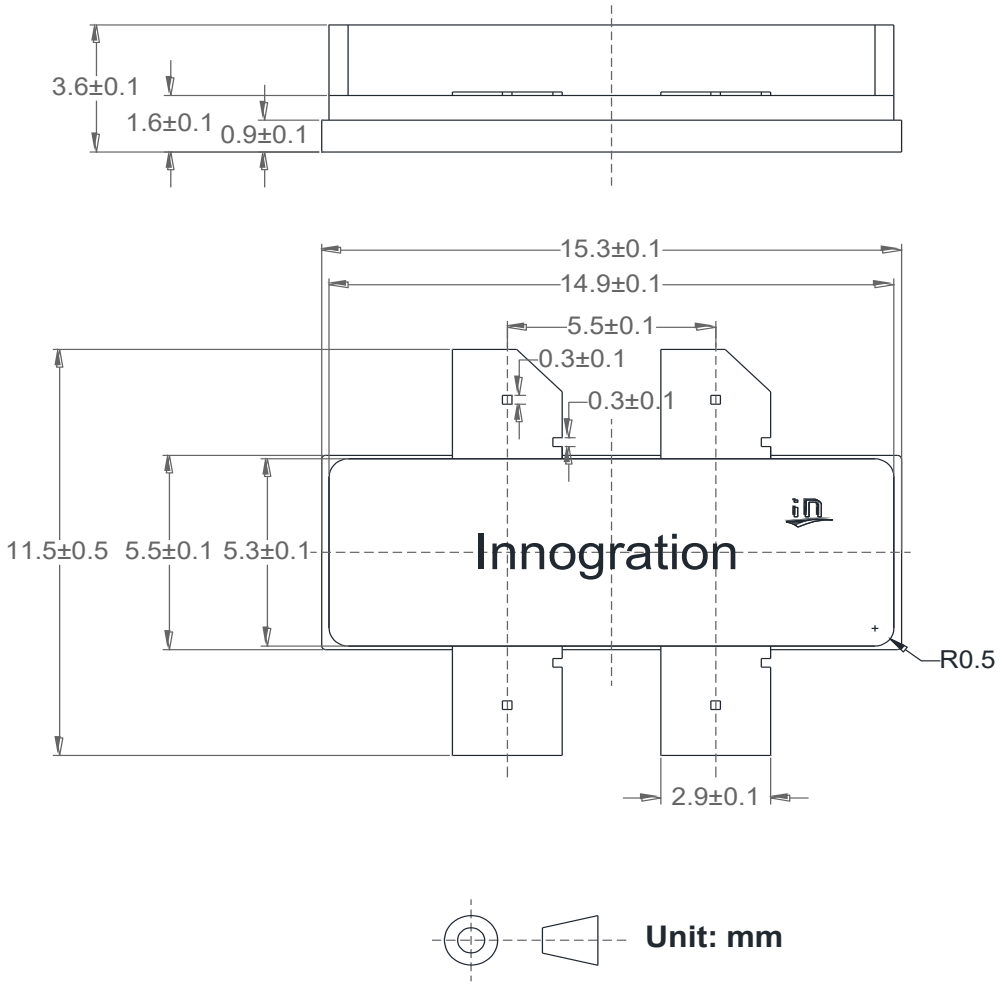


Table 4. Bill of materials of application board (PCB layout upon request, 20mils)

Reference Designator	Description	Quantity	Suggestion
C0	4700uF/63V	1	-
C1	10uF/200V, 1210	1	
C2	1uF/100V, 0805	1	
C3, C4	2.4 pF, 0603/0805	2	Beijing YuanLu HongYuan Electronic Technology CO., LTD
C5	3 pF, 0603/0805	1	
C6	2.7 pF, 0709/1111	1	
R1	10 Ω, 0603/0805	1	Murata
T1	STCV75W125L4	1	Innogration
PCB	Rogers TC350, 20mil		-

Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/11/6	V1.0	Preliminary Datasheet Creation

Application data based on RXT-25-36

Notice

Specifications are subject to change without notice. Innogration believes the information within the data sheet to be reliable. Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.
"Typical" parameter is the average values expected by Innogration in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer's technical experts for each application.
Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility.
For any concerns or questions related to terms or conditions, please check with Innogration and authorized distributors