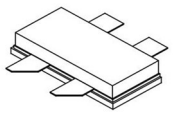
915MHz ,750W, RF Power GaN HEMT

STCV10751RBY4



Description

The STCV10751RBY4 is a 750-watt, prematched GaN HEMT, designed for multiple applications with frequencies at 915MHz narrower band.

It can support both CW and pulse operation or any other linear applications

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

•Typical Performance (On Innogration fixture with device soldered):

V_{DD} = 50 Volts, V_{GS}=-3.35V, I_{DQ} = 100 mA

Signal	Pin(dBm)	Pout(W)	Gain (dB)	Eff (%)
CW	40.9	832	18.3	80

Applications and Features

- Multiple 915MHz RF Energy applications
  - Commercial microwave oven
  - Industry heating
- P band power amplifier
- L band , avionics power amplifier
- 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
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}	-10 to +0.5	Vdc
Operating Voltage	V_{DD}	55	Vdc
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 by Finite Element Analysis, Channel--to—Case ,Case Temperature 25°C, P_D = 200W **(For reliability estimation)**	$R_{\theta CHC}$(FEA)	0.5	°C /W

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

DC Characteristics

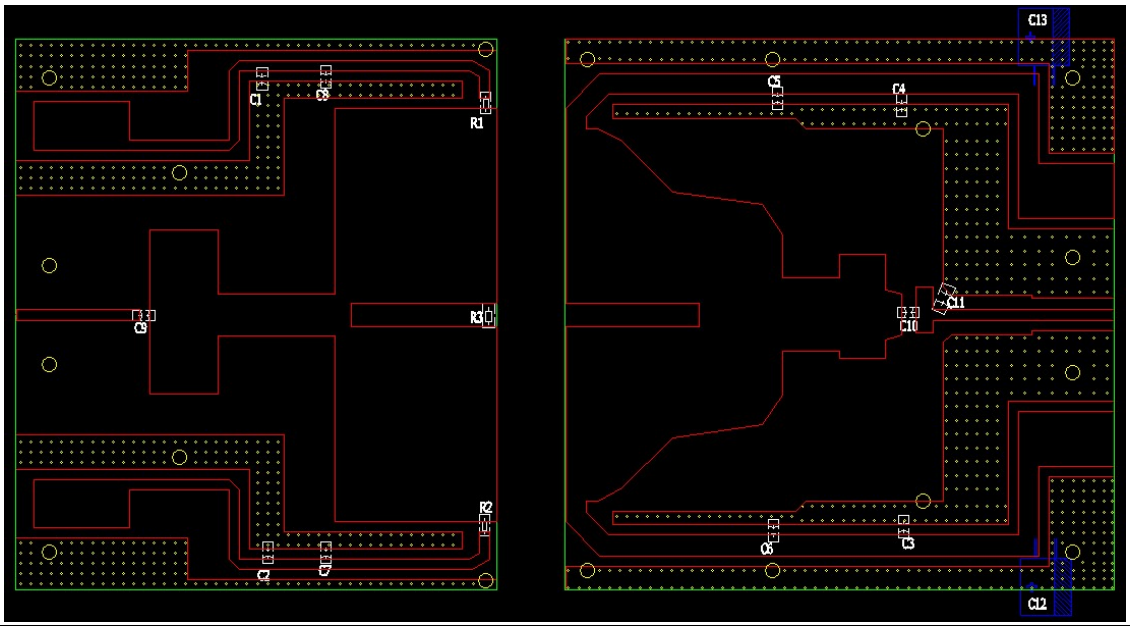
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=94mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 94mA	$V_{GS(th)}$		-3.7		V
Gate Quiescent Voltage	VDS =50V, IDS=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.3		V

Functional Tests (In Innogration Test Fixture, 50 ohm system) : V_{DD} = 50 Vdc, V_{GS}=-3.4V, f = 915MHz, Pulsed CW 20us/10% Pin=41dBm

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ Psat	Gp		18		dB
Saturated Power	Psat	750	800		W
Drain Efficiency@Psat	η_D	75	80		%
Input Return Loss	IRL	-5	-10		dB

Reference Circuit of Test Fixture Assembly Diagram

DXF file upon request



Component	Description	Suggestion
C1,C2,C3,C4	10uF	10uF/100V
C5~C9	56pF	MQ101111
C10	39pF	Mica capacitance
C11	3.3pF	Mica capacitance
C12,C13	4700uF/63V	Electrolytic Capacitor
R1，R2	18Ω	1206
R3	10Ω	1206
PCB	Input：30Mil Rogers 4350B Output：30Mil Taconic RF35-TC-A	

TYPICAL CHARACTERISTICS

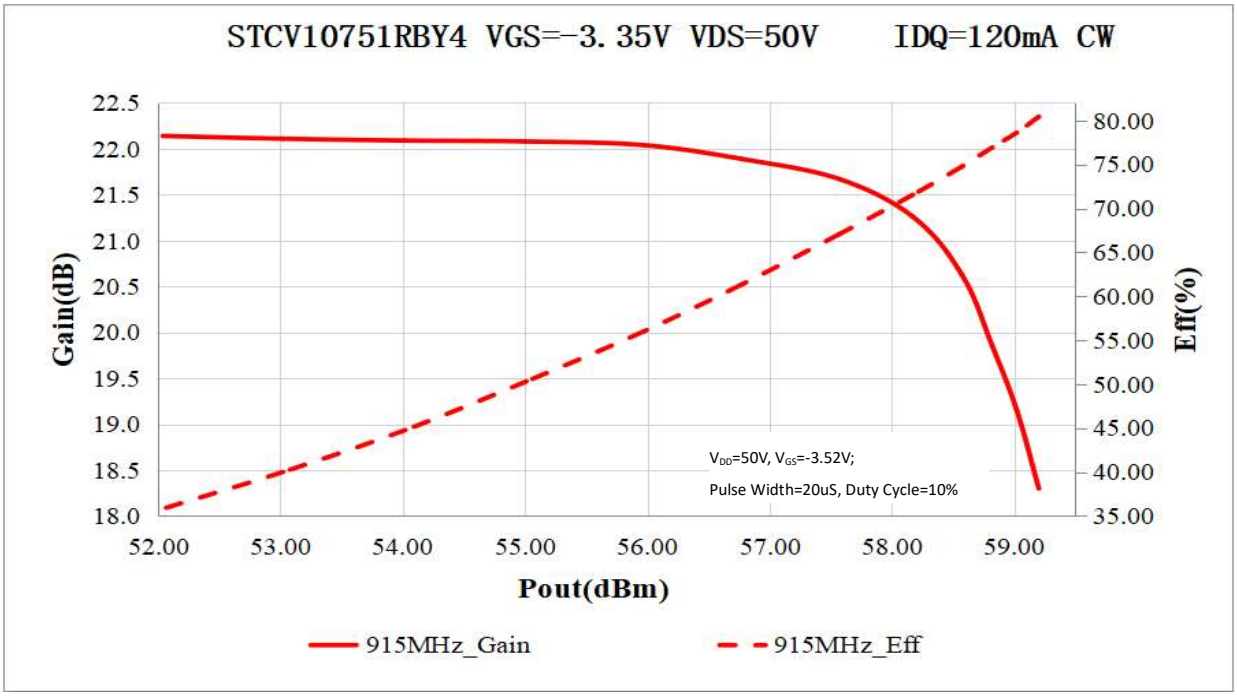


Figure 1. Power gain and drain efficiency as function of CW output power

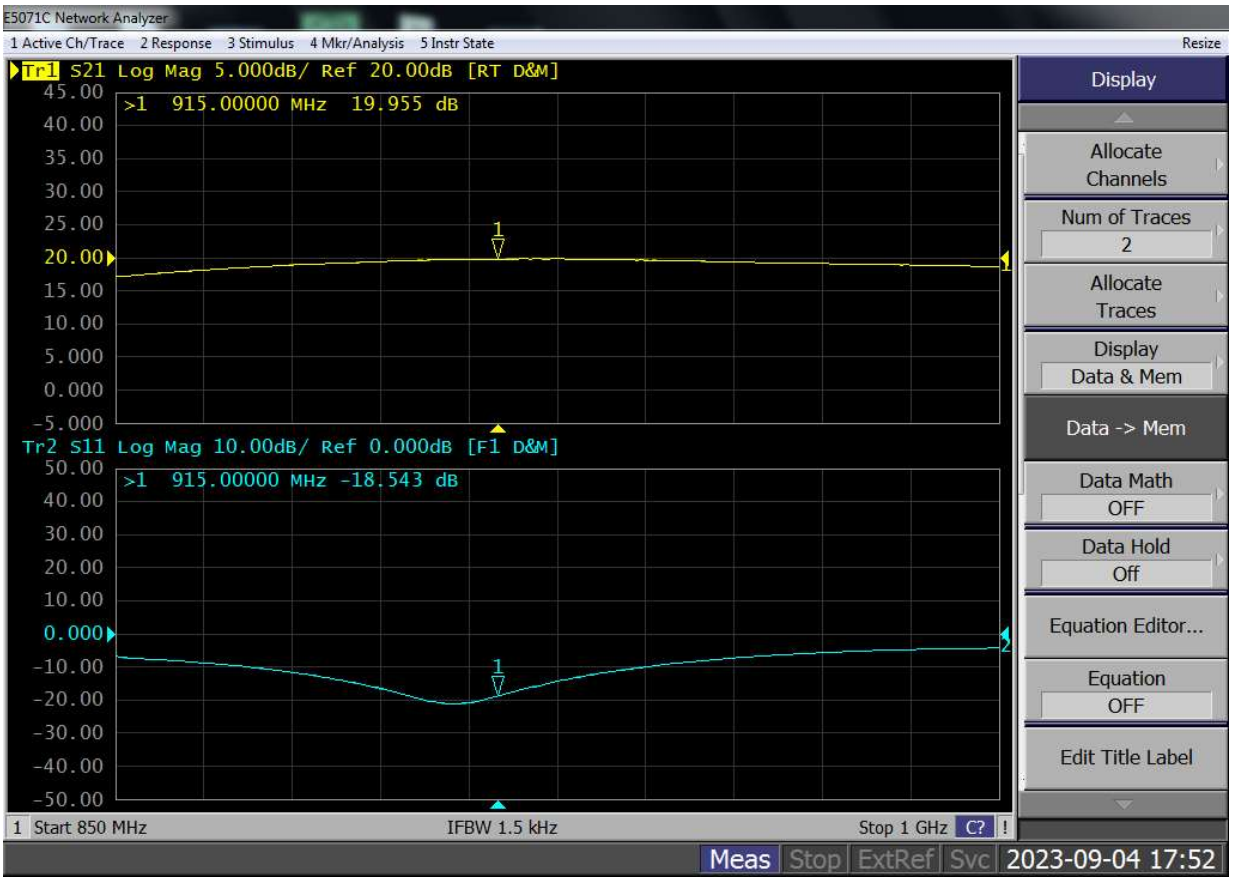
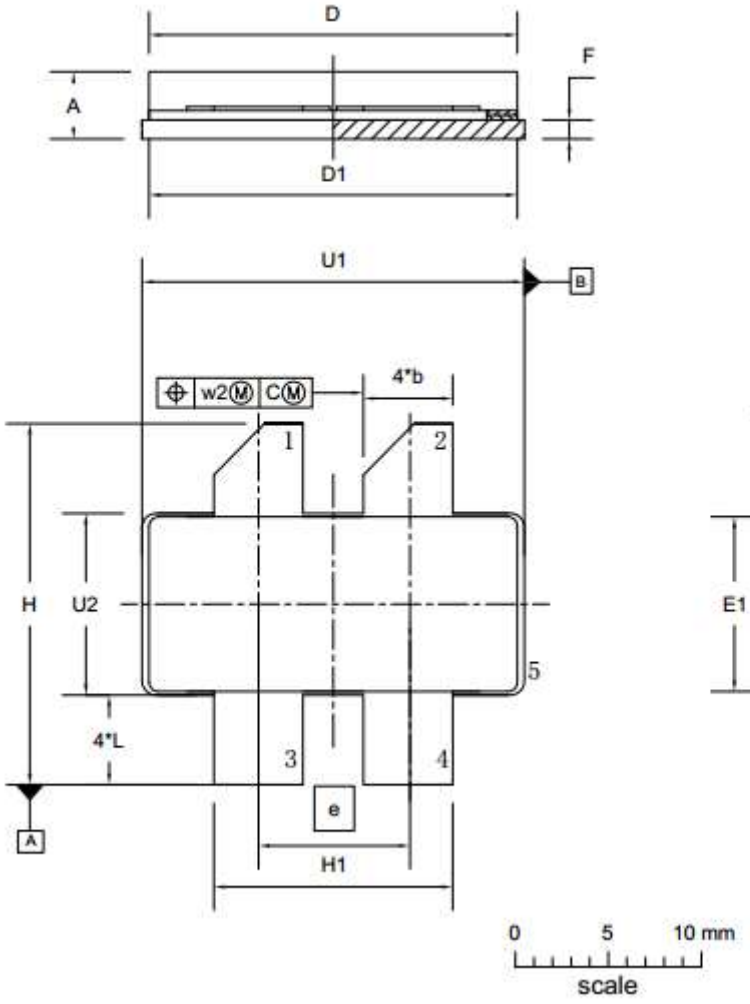


Figure 2. Network analyzer output S11/S21

Earless Flanged Ceramic Package; 4 leads



Drain		Gate		Source
1	2	3	4	5

UNIT	A	b	c	D	D_1	e	E	E_1	F	H	H1	L	Q	U_1	U_2	W_1	W_2
mm	4.72 3.43	4.67 4.93	0.15 0.08	20.02 19.61	19.96 19.66	7.90	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	12.98 12.73	5.33 4.32	1.70 1.45	20.70 20.45	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.194 0.184	0.006 0.003	0.788 0.772	0.786 0.774	0.311	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.511 0.501	0.210 0.170	0.067 0.057	0.815 0.805	0.390 0.380	0.01	0.02

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4					03/12/2013

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/9/4	**V1.0**	**Preliminary Datasheet Creation**

Application data based on TC-23-54

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