



Gallium Nitride 50V, 800W, 0.6-1GHz RF Power Transistor

Description

The STCV10800RBY4 is a 800watt Doherty pair capable, GaN HEMT, ideal for for 4G/5G cellular applications up to 1GHz.

It can be configured as asymmetrical Doherty delivering 100-115W average power, according to normal 8-9dB back off.

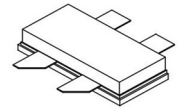
There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical RF performance on 758-803MHz Doherty

$V_{DD} = 50 \text{ Vdc}$, $I_{DQ_main} = 150\text{mA}$, $V_{gs_peak} = -5.2\text{V}$, 1 carrier WCDMA signal PAR=10.5dB

Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Eff(%)
758	50.5	8.39	58.87	771.0	-30.6	16.2	60.4
780	50.5	8.80	59.28	847.0	-29.9	15.8	61.2
803	50.5	8.25	58.74	748.2	-29.7	14.9	62.8

STCV10800RBY4



Applications

- Asymmetrical Doherty amplifier within <1GHz
- UHF TV
- P band communication

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)

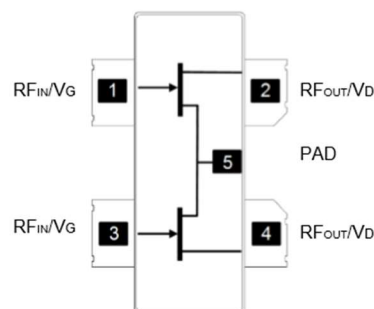


Table 1. Maximum Ratings

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}	82	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 = 85°C, at Pd=70W, on Doherty application board	R _{θJC}	1.4	°C /W

Table 3. Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	700MHz, Pout=115W pulse CW for All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature

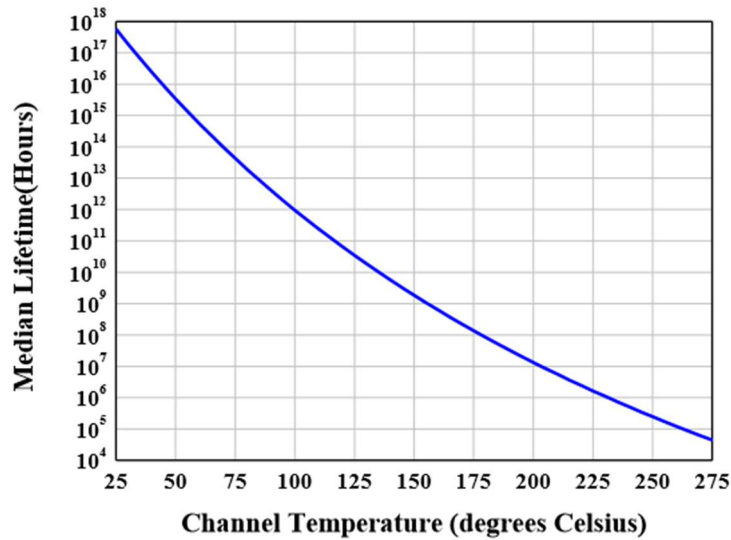




Figure 3: Efficiency and power gain as function of Pout (758-803MHz Doherty)

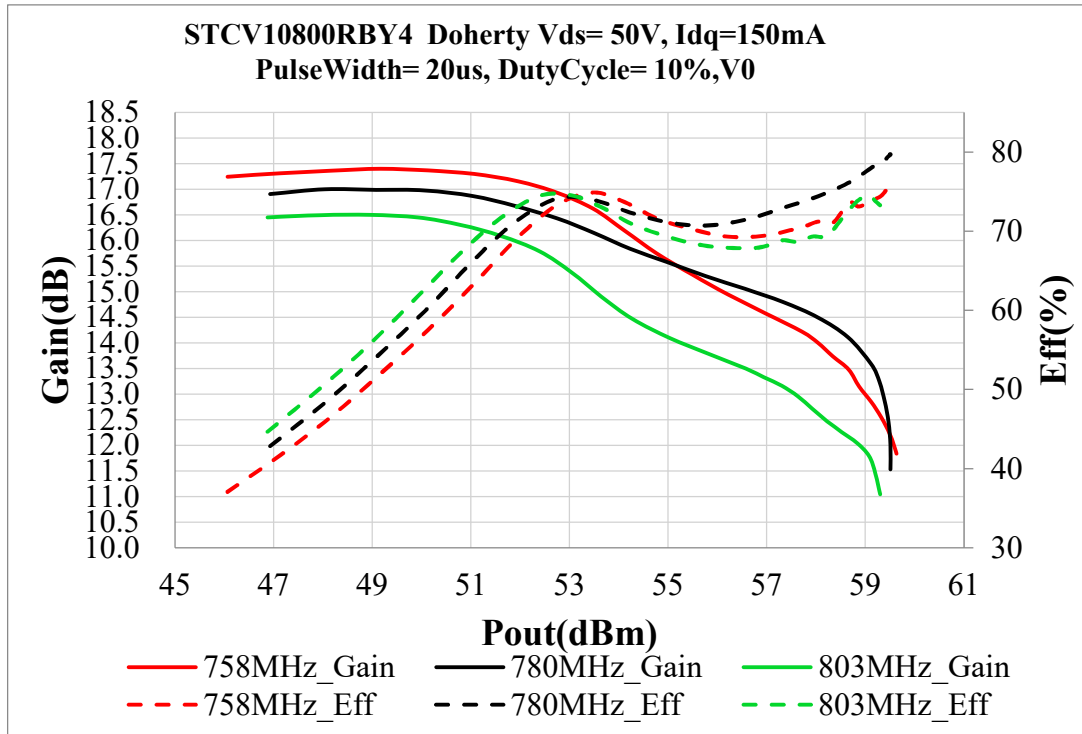


Figure 4: Network analyzer output, S11 and S21 (758-803MHz Doherty)

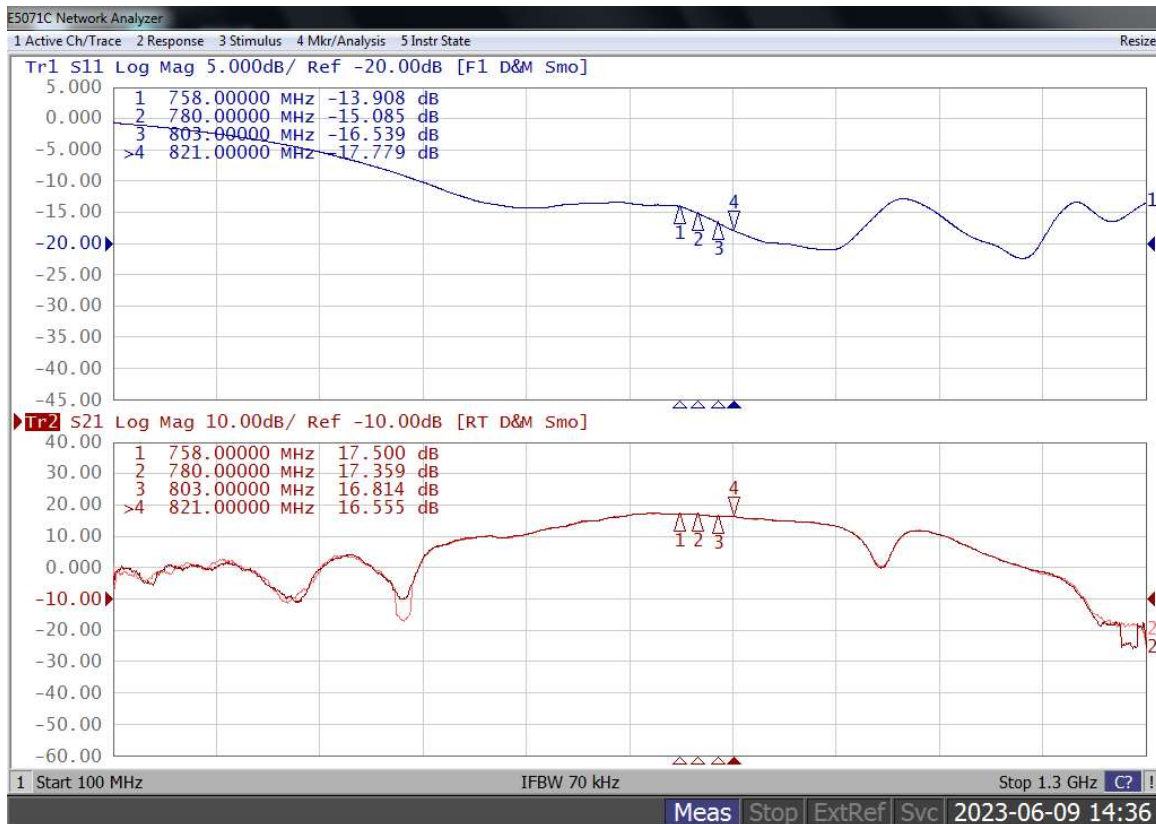


Figure 5: Picture of application board Doherty circuit for 758-803MHz

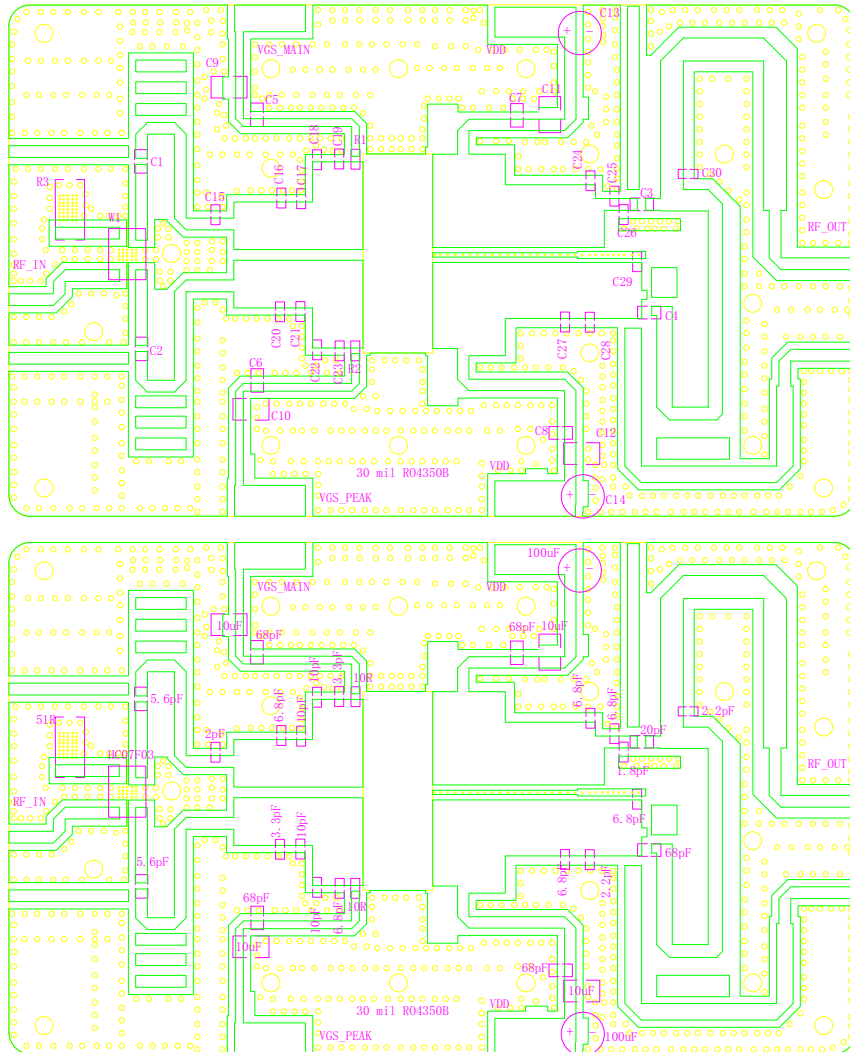
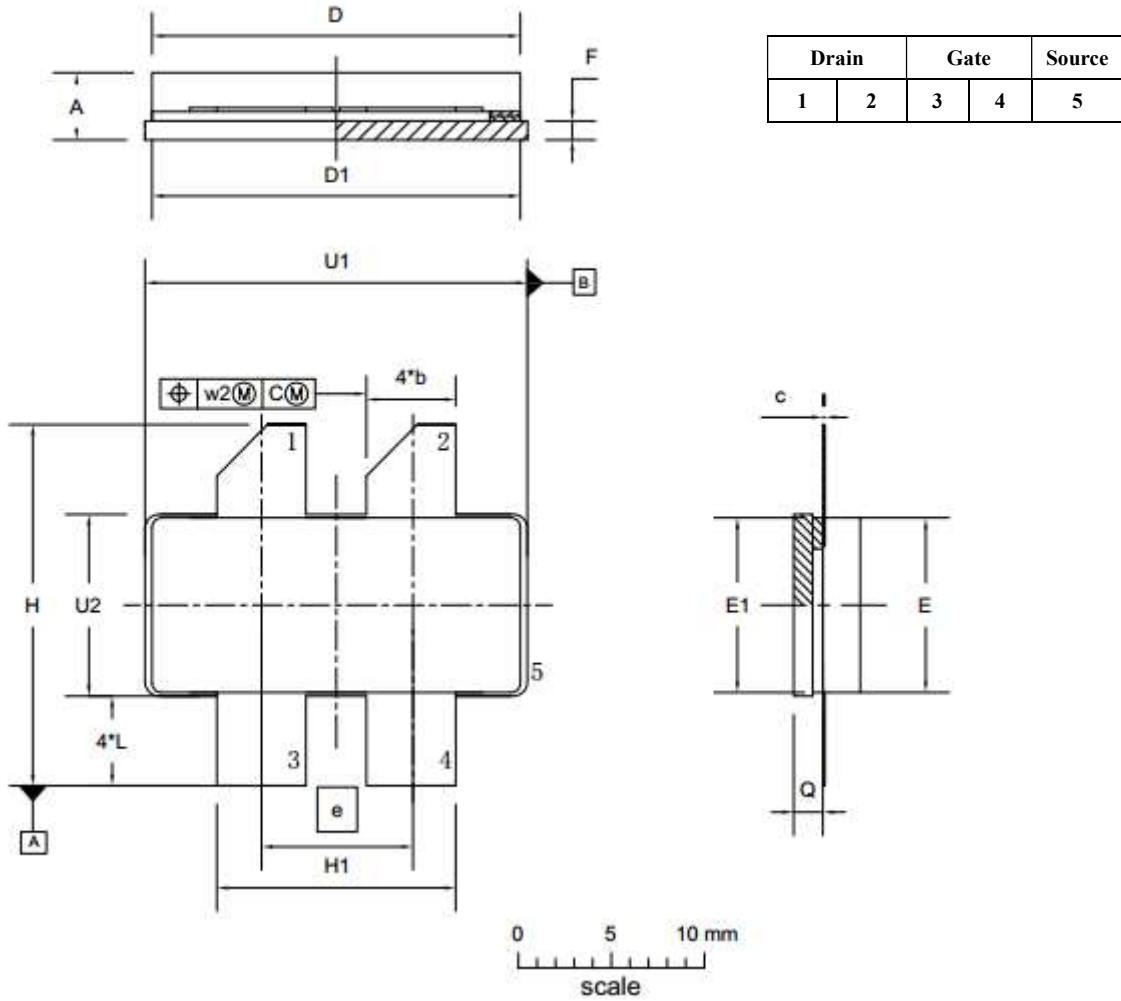


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 30mils)

Designator	Comment	Footprint	Quantity
C1, C2	5.6 pF	0603/0805	2
C3	20 pF	0603/0805	1
C4, C5, C6, C7, C8	68pF	0805	5
C9, C10, C11, C12	10 uF/100V	1210	4
C13, C14	100 uF/63V		2
C15	2 pF	0603/0805	1
C16, C23, C24, C25, C27, C29	6.8 pF	0603/0805	6
C17, C18, C21, C22	10 pF	0603/0805	4
C19, C20	3.3 pF	0603/0805	2
C28, C30	2.2pF	0603/0805	2
R1, R2	10 Ω	0603	2
R3	51 Ω	2512	1
W1	HC07F03		1



Earless Flanged Ceramic Package; 4 leads



UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	Q	U ₁	U ₂	W ₁	W ₂
mm	4.72	4.67	0.15	20.02	19.96	7.90	9.50	9.53	1.14	19.94	12.98	5.33	1.70	20.70	9.91	0.25	0.51
	3.43	4.93	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.73	4.32	1.45	20.45	9.65		
inches	0.186	0.194	0.006	0.788	0.786	0.311	0.374	0.375	0.045	0.785	0.511	0.210	0.067	0.815	0.390	0.01	0.02
	0.135	0.184	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.501	0.170	0.057	0.805	0.380		

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
2023/6/9	V1.0	Preliminary Datasheet Creation

Application data based on:LSM-23-20

Notice

Specifications are subject to change without notice. Innogrations believes the information within the data sheet to be reliable. Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innogrations 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.

Innogrations 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 Innogrations 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 Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.