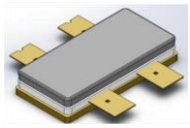
GaN HEMT 50V, 360W,1.8-2.2GHz RF Power Transistor

STBV22360B4C



Description

The STBV22360B4C is a dual path 360watt , Input matched GaN HEMT, ideal for applications from 1.8 to 2.2GHz especially for LTE/5G, housed in cost effective ACP package. It is the cost down version of Its ceramic peer STBV22360BY4.

- Typical WCDMA 1C performance on 2.1GHz asymmetrical Doherty with device soldered

VDS= 50V, IDQ=50mA(Vgm=-3.3V，Vgp=-5.0V)

Freq (MHz)	Pout (dBm)	Psat (W)	ACPR (dBc)	Gain (dB)	Eff(%)
2110	47.60	374.7	-28.1	15.9	63.5
2140	47.60	373.4	-30.8	15.3	61.4
2170	47.60	363.4	-33.2	15.6	60.2

Applications

- Asymmetrical Doherty amplifier within 1.8-2.2GHz
- Sub-2GHz power amplifier
- CW or pulsed Amplifier

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)

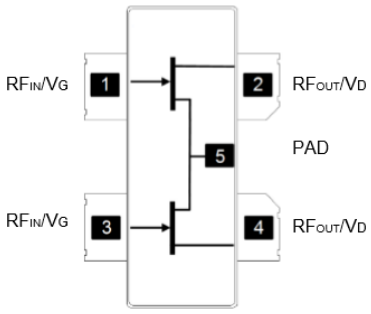


Table 1. Maximum Ratings

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	Igs	48.3	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= 85°C, at Pd=50W, on Doherty application board	$R_{\theta JC}$	1.9	°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=16.8mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 16.8mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =50V, IDS=50mA, Measured in Functional Test	$V_{GS(Q)}$		-3.3		V

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=31.5mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 31.5mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =50V, IDS=130mA, Measured in Functional Test	$V_{GS(Q)}$		-3.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.14GHz, Pout=55W WCDMA 1 Carrier in Doherty circuit All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature

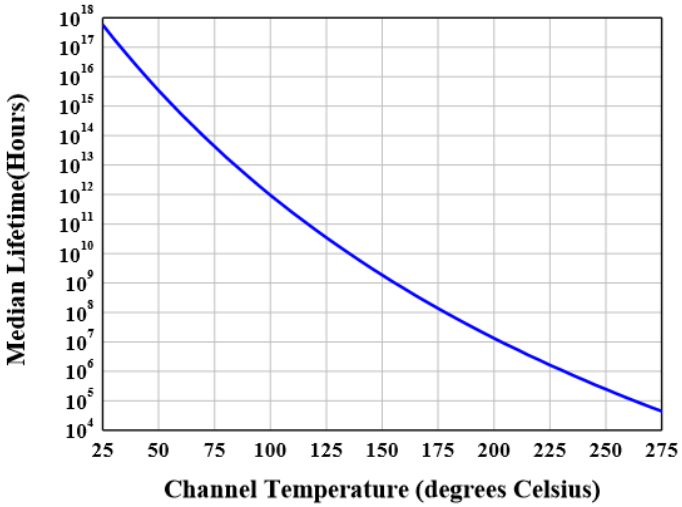


Figure 3: Efficiency and power gain as function of Pout (2.1-2.2GHz Doherty)

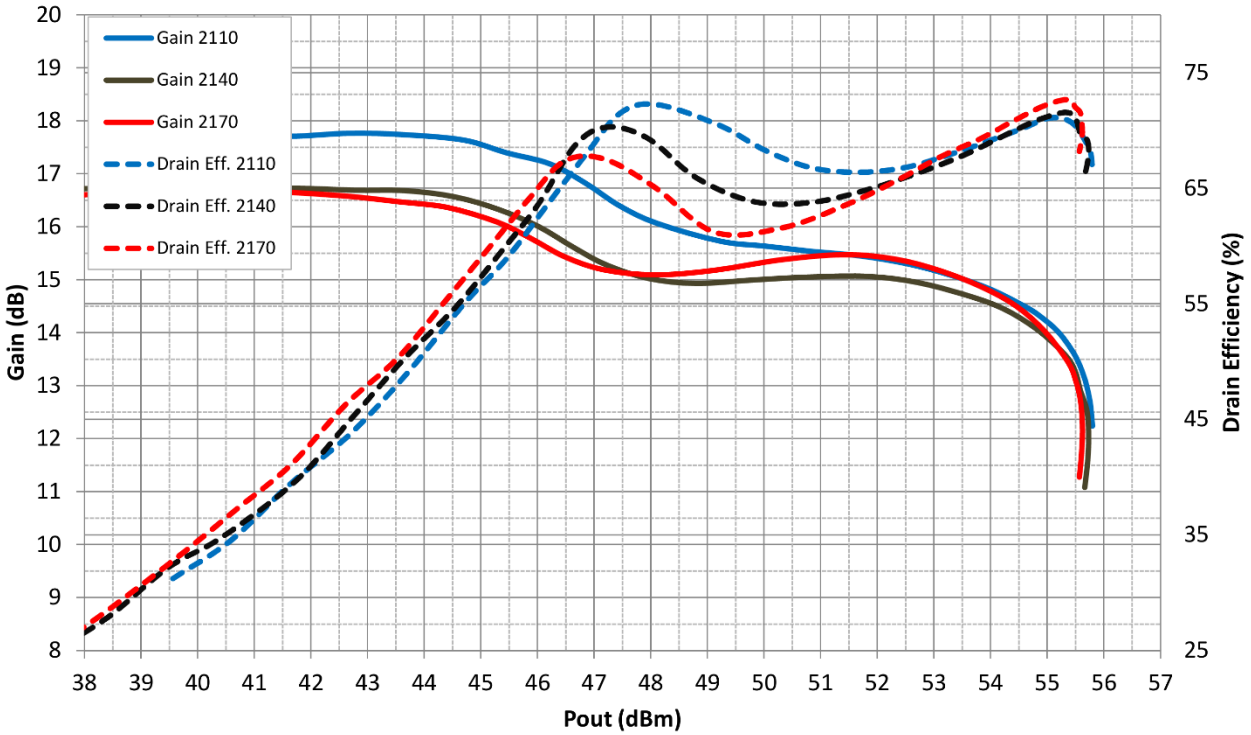


Figure 4: Network analyzer output, S11 and S21 (2.1-2.2GHz Doherty)

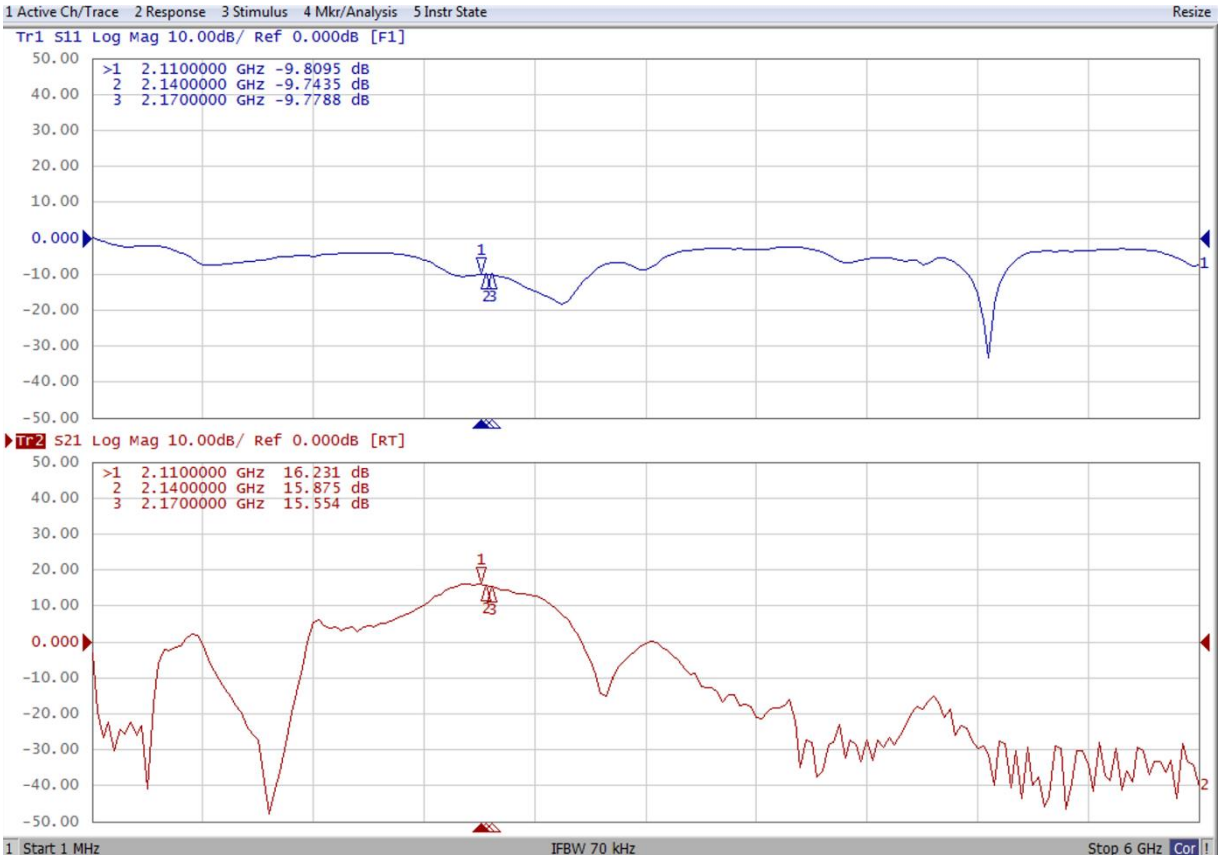
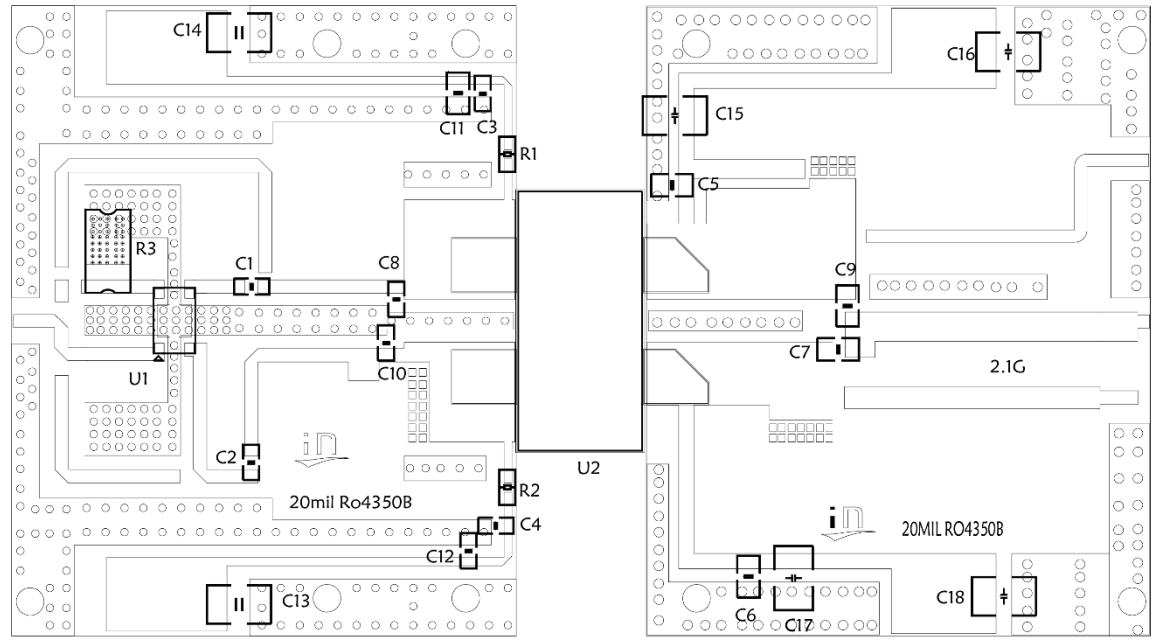


Figure 5: Picture of application board Doherty circuit for 2.1-2.2GHz



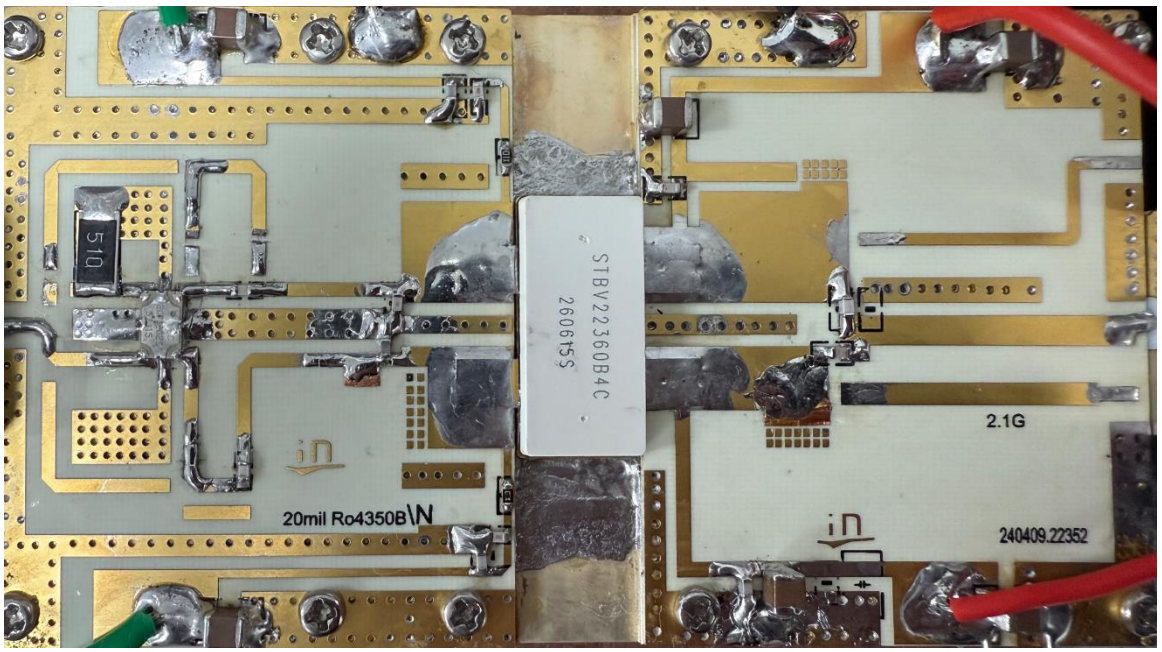
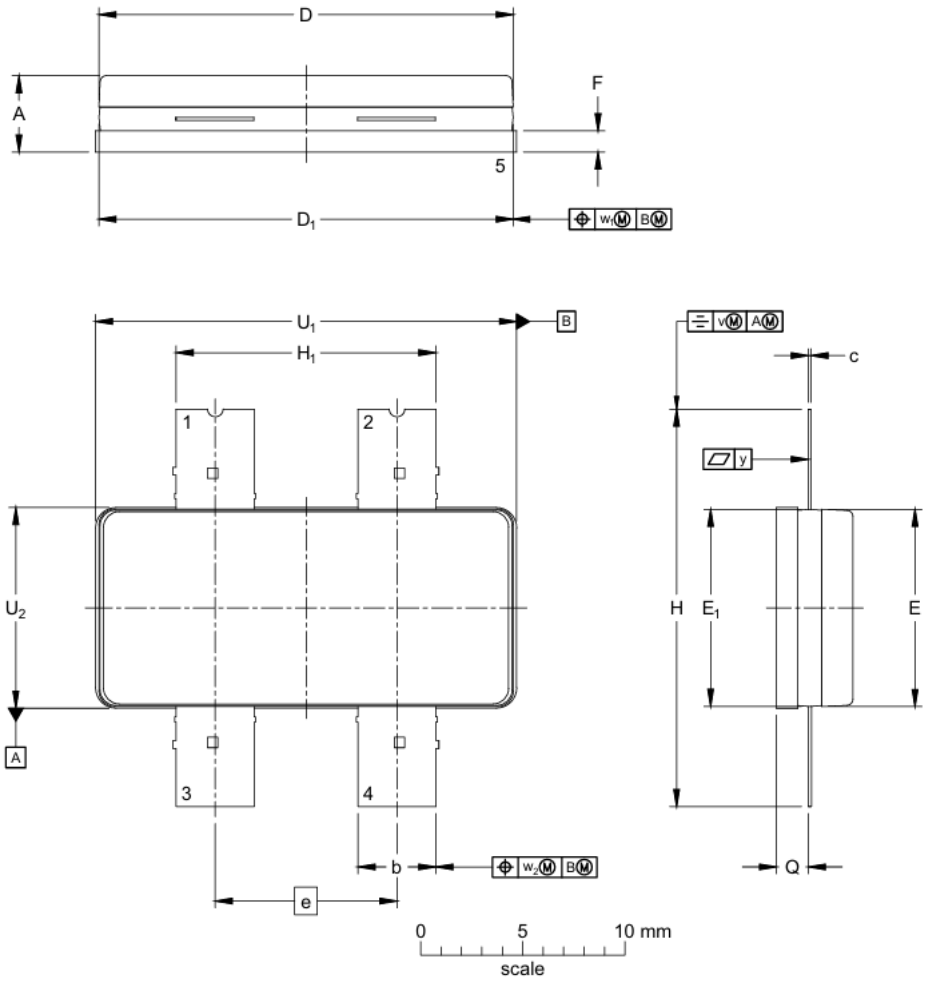


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Reference	Footprint	Value	Quantity
C1	0603	10pF/250V	1
C2, C3, C4, C5, C6, C7	0603	20pF/250V	6
C8	0603	1.0pF/250V	1
C9	0603	2.4pF/250V	1
C10	0603	0.5pF/250V	1
C11, C12	0805	1nF/50V	2
C13, C14, C15, C16,	1210	10uF/100V	6

C17, C18			
R1, R2	0603	10R	2
R3	2512	50R	1
U1	5.08*3.18mm	X3C20F1-02S	1
U2	B4C	STBV22360B4C^{v0}	1

Earless Flanged Plastic Air Cavity Package; 4 leads



Dimensions

Unit		A	b	c	D	D_1	E	E_1	e	F	H	H_1	Q(1)	U_1	U_2	v	w_1	w_2	y
mm	max	4.01	3.91	0.18	20.42	20.37	9.80	9.75	8.89	1.14	19.53	12.83	1.68	20.70	9.91	0.50	0.50	0.50	0.10
	nom																		
	min	3.40	3.71	0.13	20.12	20.17	9.50	9.55		0.94	19.33	12.57	1.45	20.50	9.70				

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/3/2	**V1.0**	**Preliminary Datasheet Creation**

Application data based on: ZBB-26-02

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