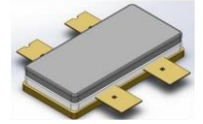


**GaN HEMT 50V, 700W, 1.3-1.6GHz RF Power Transistor****Description**

The STBV16700B4C is a dual path 700watt , Input matched GaN HEMT, ideal for applications from 1.3 to 1.6GHz especially for LTE/5G.

- Typical WCDMA 1C performance on 1.5GHz asymmetrical Doherty with device soldered
VDS= 50V, IDQ=200mA(Vm=-3.30V, Vp=-5.3V)

Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Efficiency (%)
1365	50.51	8.26	58.77	752.6	-29.0	15.7	61.0
1445	50.47	8.44	58.91	777.7	-28.4	16.6	62.1
1525	50.47	8.60	59.07	806.6	-29.8	15.7	59.8

STBV16700B4C**Applications**

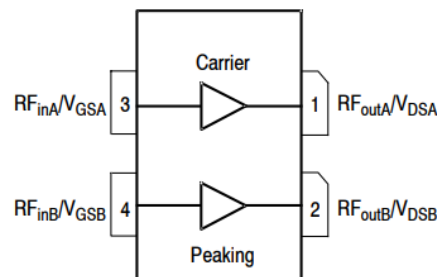
- Asymmetrical Doherty amplifier within 1.3-1.6GHz
- Sub-2GHz power amplifier
- CW or pulsed Amplifier

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	I _{gs}	99	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 $T_c = 85^\circ\text{C}$, at $P_d = 80\text{W}$, on Doherty application board	$R_{\theta JC}$	0.9	$^\circ\text{C}/\text{W}$

Table 3. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 36\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 36\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$, $I_{DS} = 200\text{mA}$, 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	$V_{GS} = -8\text{V}$; $I_{DS} = 63\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 63\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$, $I_{DS} = 400\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-3.3		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, $P_{out} = 100\text{W}$ WCDMA 1 Carrier in Doherty circuit All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature

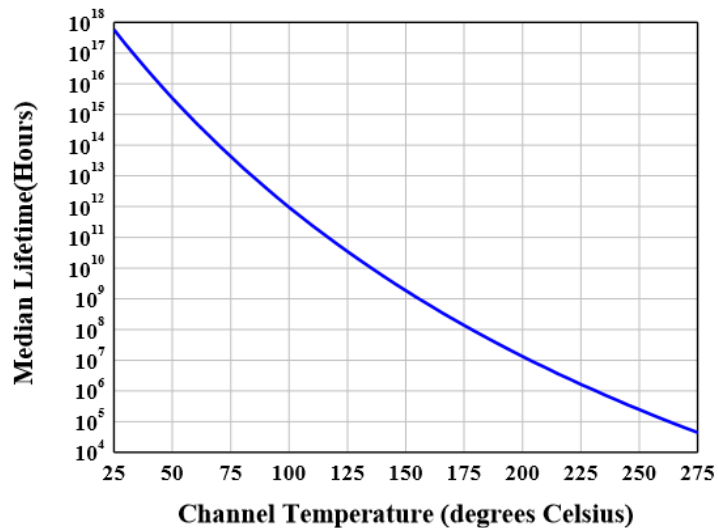




Figure 3: Efficiency and power gain as function of Pout (1.5GHz Doherty)

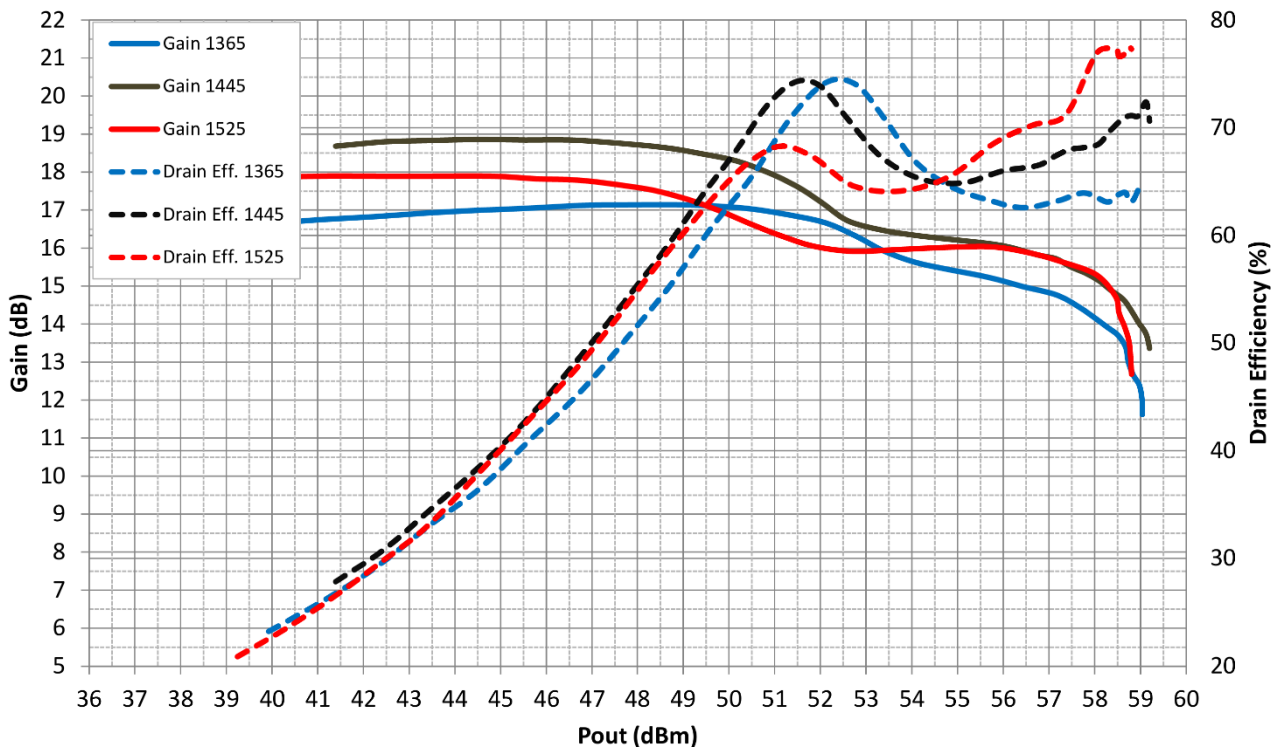


Figure 4: Network analyzer output, S11 and S21

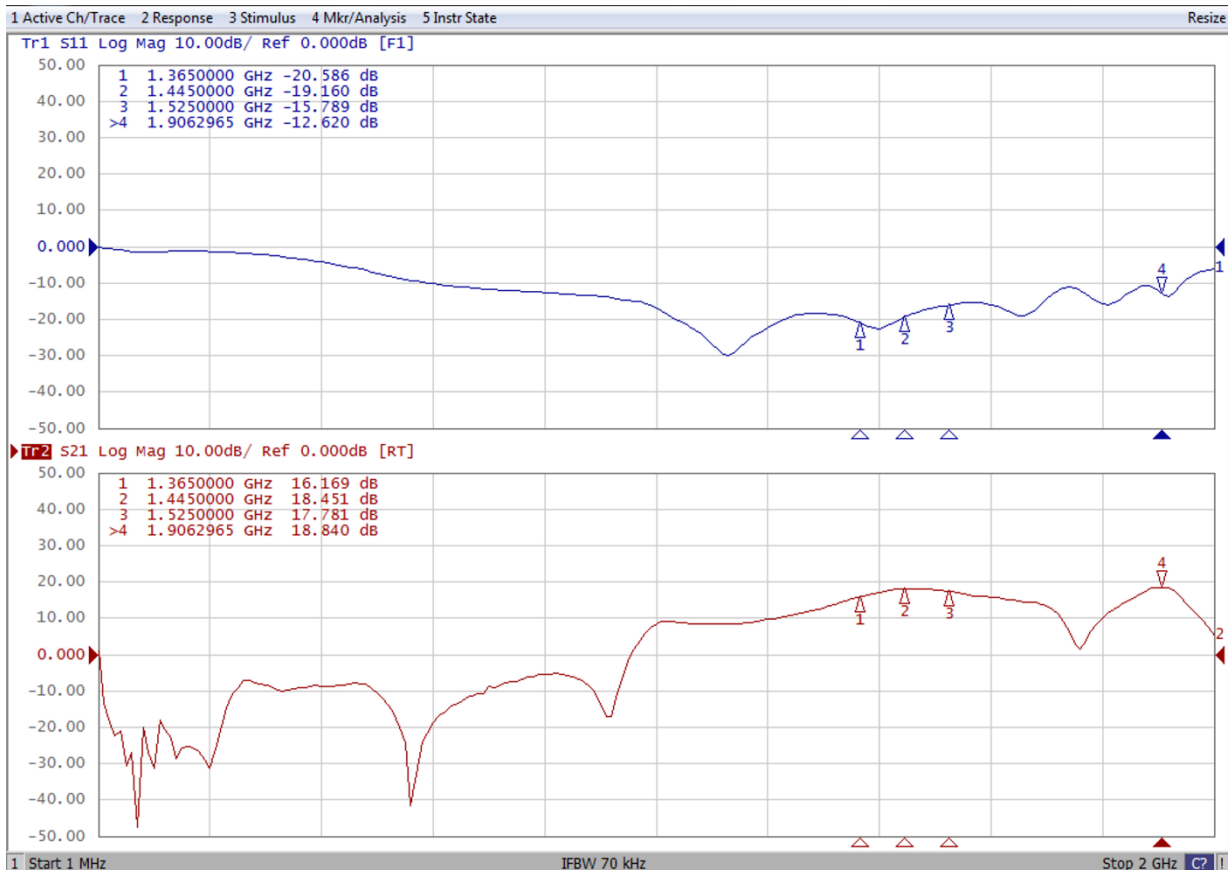


Figure 5: Picture of application board Doherty circuit for 1.5GHz

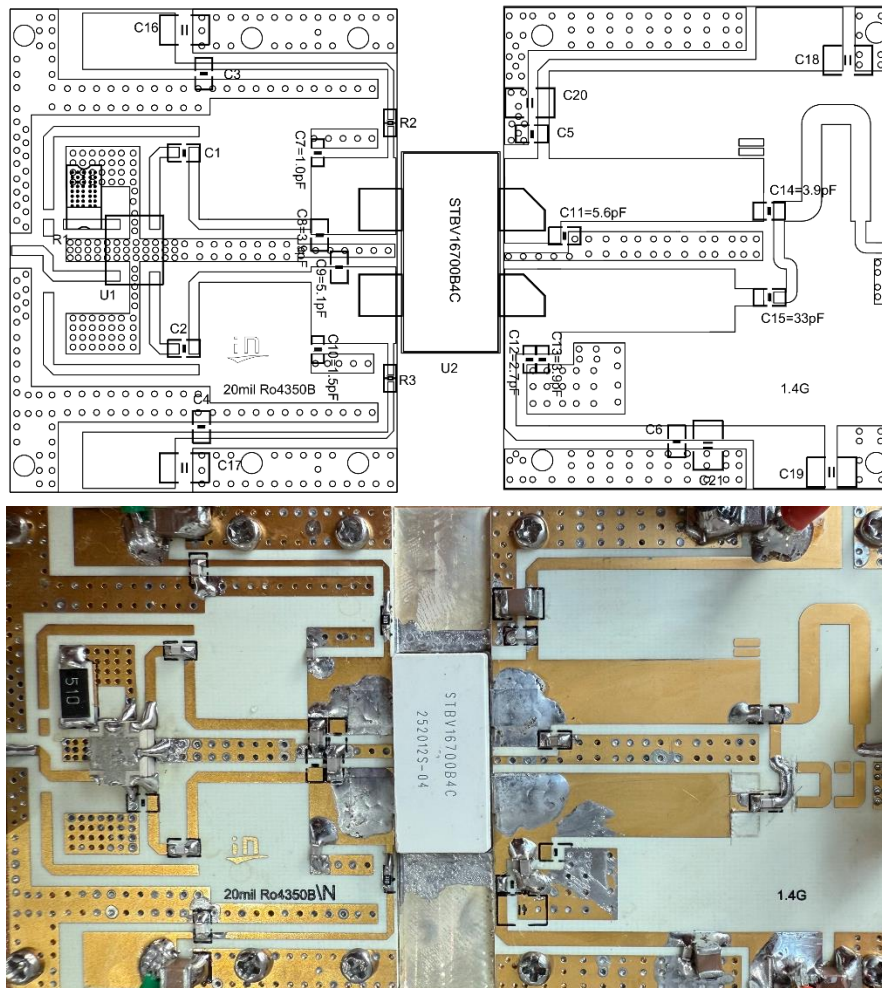
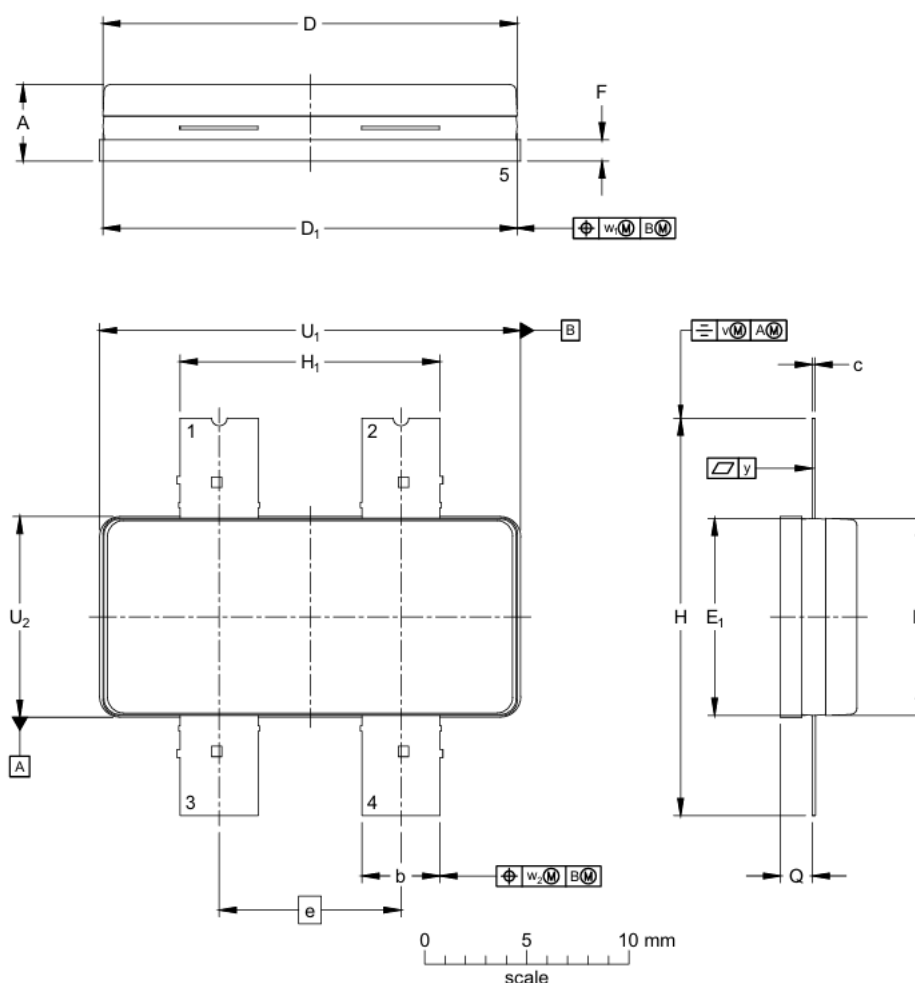


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Reference	Footprint	Value	Quantity
C1, C2, C3, C4, C5, C6, C15	0603	33pF/250V	7
C7	0603	1.0pF/250V	1
C8, C13, C14	0603	3.9pF/250V	3
C9	0603	5.1pF/250V	1
C10	0603	1.5pF/250V	1
C11	0603	5.6pF/250V	1
C12	0603	2.7pF/250V	1
C16, C17, C18, C19, C20, C21	1210	10uF/100V	6
R2, R3	0603	10R	2
R1	2512	51R	1
U1	6.35*5.08mm	XC1400P-03S	1
U2	B4C	STBV16700B4C	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
2025/7/4	V1.0	Preliminary Datasheet Creation

Application data based on: ZBB-25-21

Notice

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