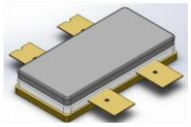
GaN HEMT 50V, 350W, VHF/UHF Transistor

STBV15350B4C



Description

The STBV15350B4C is a single ended 350watt, GaN HEMT, ideal for CW applications within VHF/UHF/L Band up to 1.5GHz. **Due to internal connection of both leads, it operated as single ended device only** There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical CW performance across **900-1050MHz** with device soldered

V_{DD} = 48 Vdc, I_{DQ} = 100mA, CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
900	55.52	356.1	71.2	19.47	56.1	407.2	75.1
950	54.83	303.8	73.0	19.94	55.62	364.8	79.1
1000	53.93	247.4	68.4	19.31	55.19	330.6	77.4
1050	53.01	199.8	58.2	18.67	54.89	308.4	68.6

Recommended driver: ITGV22010C6 (50V LDMOS)

Applications

- UHF/VHF/L band amplifier
- PIM test equipment

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}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	55	Vdc
Maximum gate current	Igs	47	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 Pd=140W,	$R_{\theta JC}$	0.7	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit

Drain-Source Breakdown Voltage	VGS=-8V; IDS=43.2mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 43.2mA	$V_{GS(th)}$	-4	-3	-2	V
Gate Quiescent Voltage	VDS =50V, IDS=500mA, Measured in Functional Test	$V_{GS(Q)}$		-3.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1GHz, Pout=350W pulse CW for each path All phase, No device damages	VSWR		10:1		

900-1050MHz

Figure 3: S11 / S21 output from network analyzer

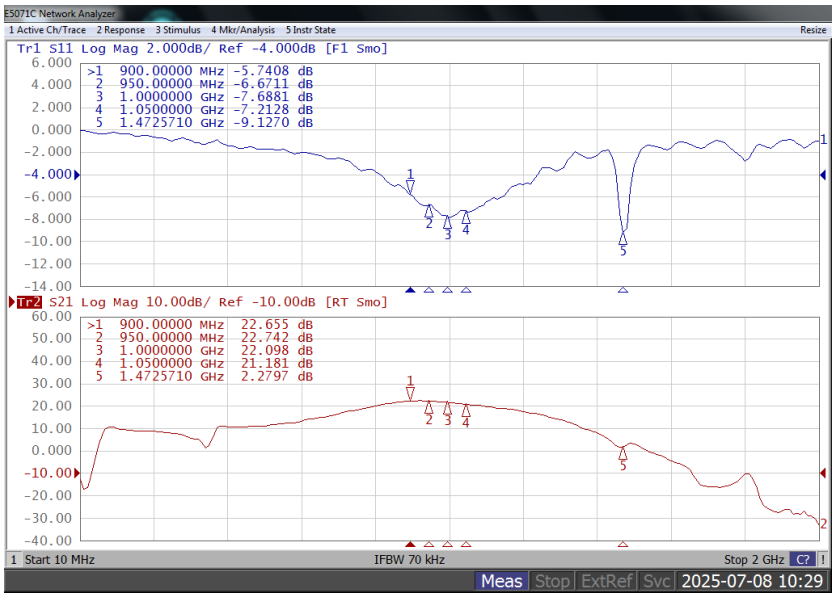


Figure 4: Picture of application board

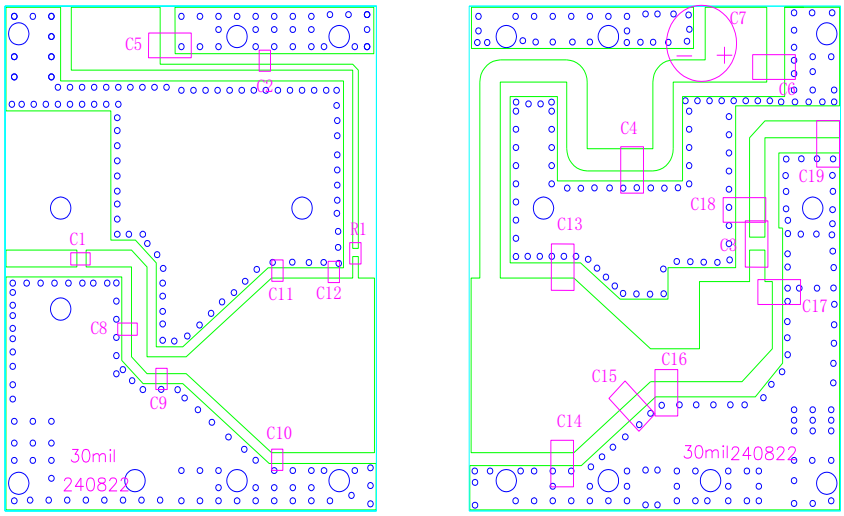
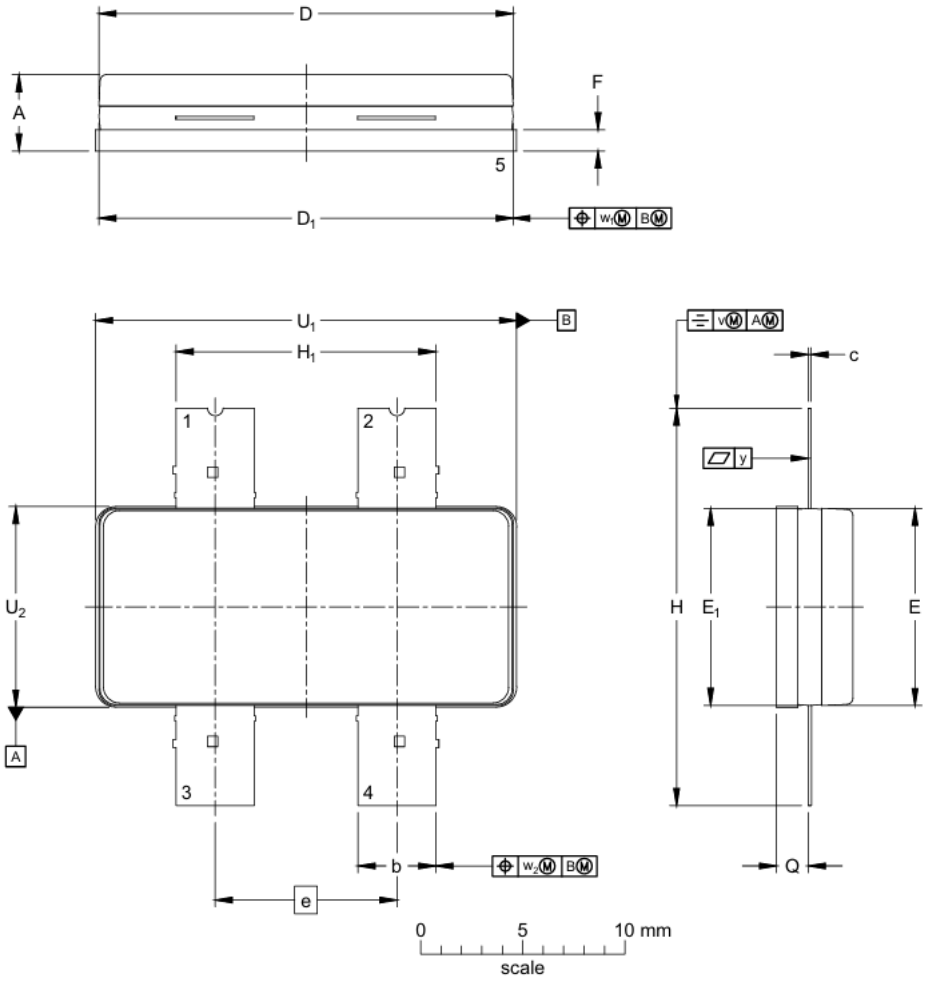


Table 4. Bill of materials of application board (PCB layout upon request，RO4350B 20mils)

Designator	Footprint	Comment	Quantity
C1	0603/0805	4.7pF	1
C2	0603/0805	47pF	1
C3, C4	1210	47pF	2
C5, C6	1210	10 uF/100V	2
C7		1000 uF/63V	1
C8	0603/0805	2.0 pF	1
C9	0603/0805	3.0 pF	1
C10, C11, C12	0603/0805	6.8 pF	3
C13, C14	1210	5.6 pF	2
C15, C16, C17	1210	3.0 pF	3
C18	1210	1.5 pF	1
C19	1210	0.5 pF	1
R1	0603	10 Ω	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		1.14	19.53	12.83	1.68	20.70	9.91	0.50	0.50	0.50	0.10
	nom								8.89										
	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
2025/7/8	**V1.0**	**Preliminary datasheet creation**

Application data based on: LSM-25-20

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