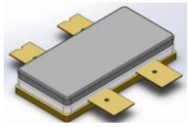
GaN HEMT 28V, L band, 200W, RF Power Transistor

GTAH15200B4C



Description

The GTAH15200B4C is a 200W ,**single ended** GaN HEMT, designed for ISM/RF Energy application Within L band

It can be used in CW, Pulse and any other modulation modes. There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical Class AB RF Performance with device soldered

  Vds=28V, Vgs=-3V, CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
1300	53.05	202.0	56.4	18.55	54.27	267.3	63.0
1400	52.38	172.9	58.7	19.05	54.34	271.6	69.7
1500	51.41	138.3	61.2	19.74	53.19	208.3	71.8

Applications

- L and P band power amplifier
- ISM/RF Energy power amplifier

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

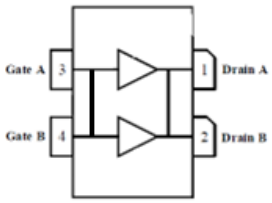
1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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)



***Notice: Both leads at input and output are internally connected, device is only usable as single ended**

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+150	Vdc
Gate--Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum gate current	Igs	60	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 Pdiss=75W	$R_{\theta JC}$	0.75	°C /W

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

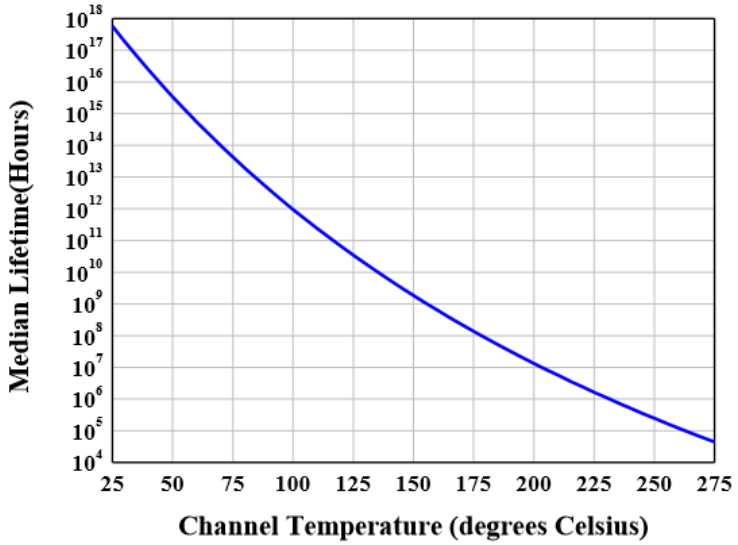
DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=30mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 30mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =28V, IDS=500mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, Pout=200W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



Typical performance

Figure 3: Efficiency and power gain as function of Pout

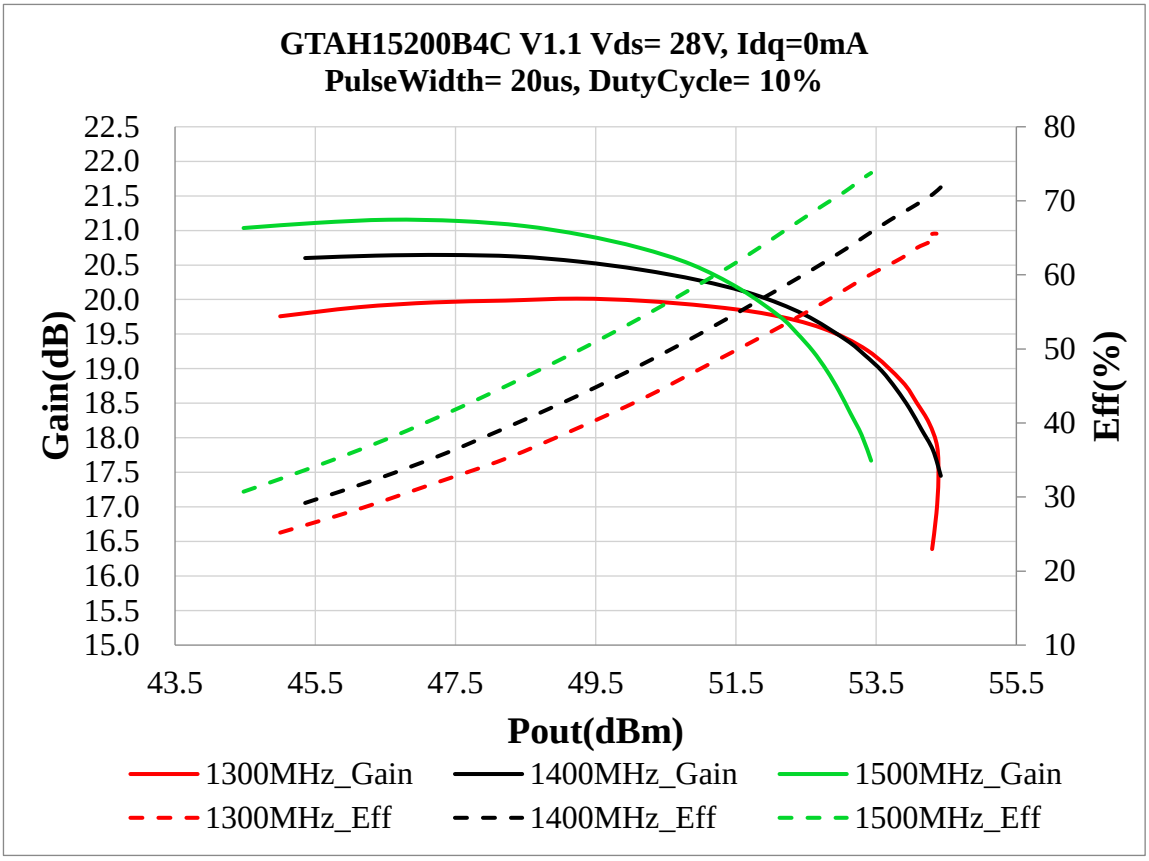


Figure 5: Network analyzer output S11/S21

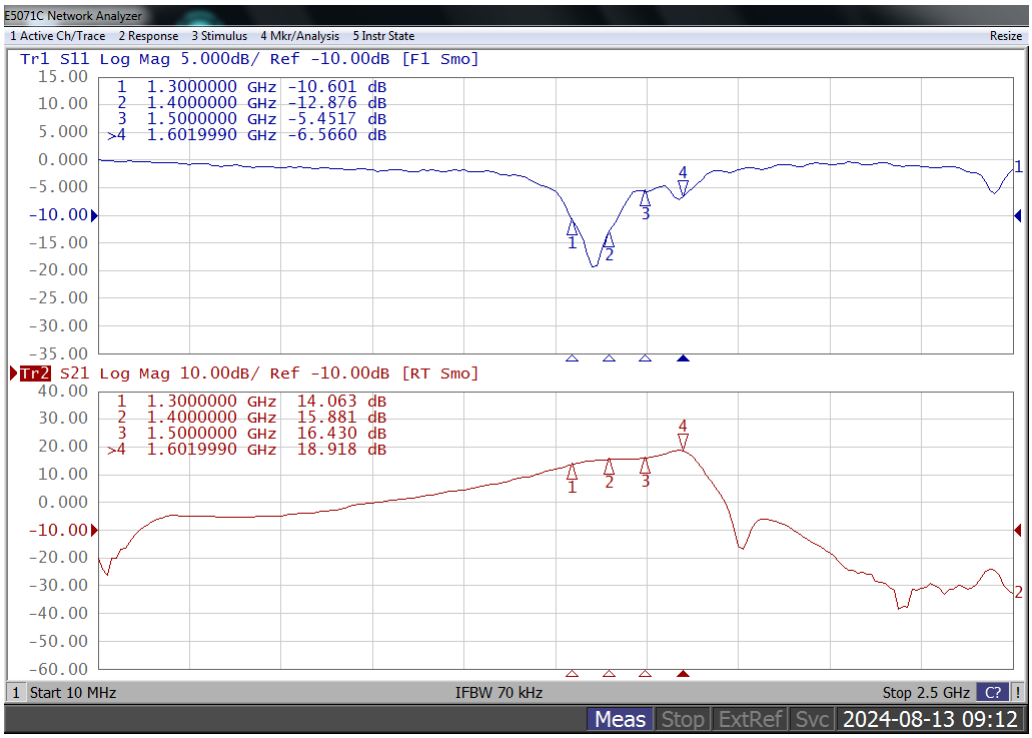


Figure 5: Picture of application board

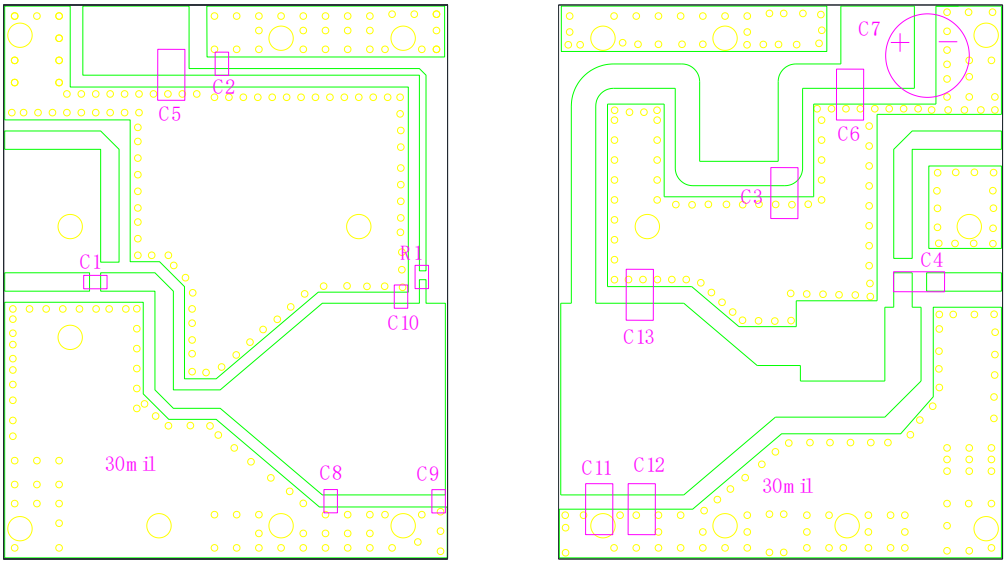
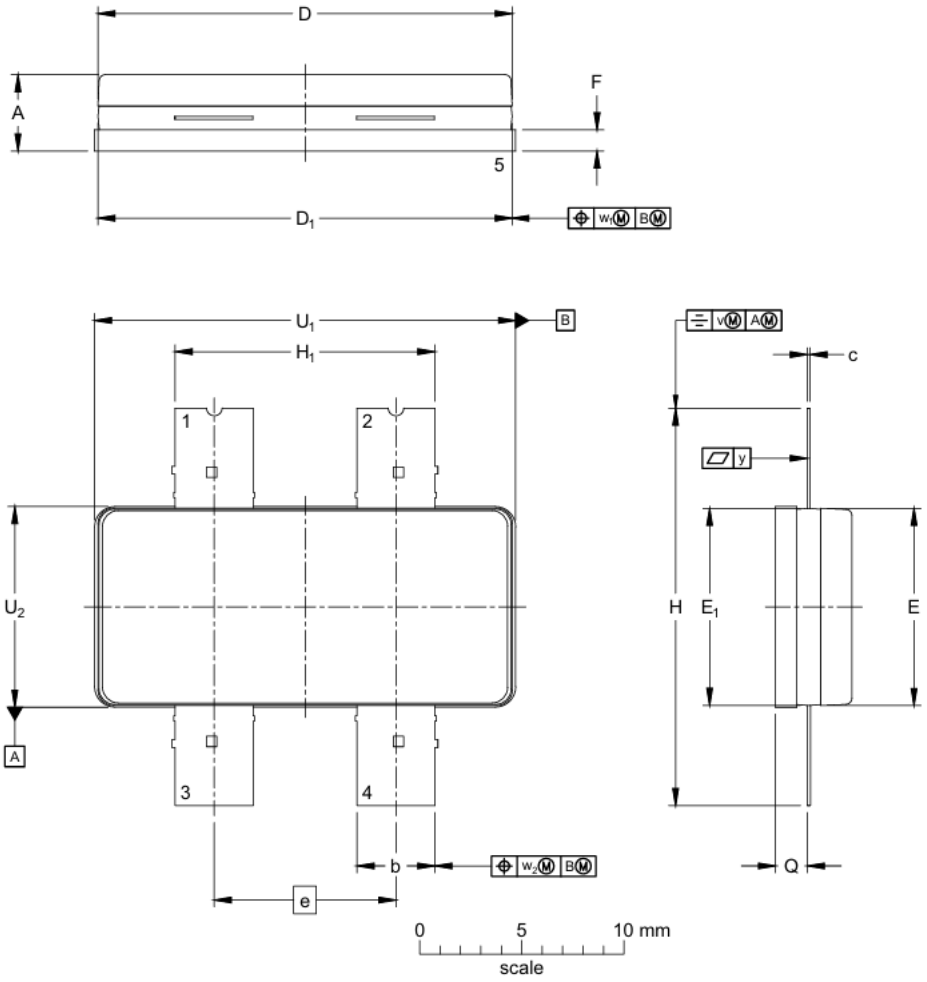


Table 4. Bill of materials of application board (PCB layout upon request)

Designator	Comment	Footprint	Quantity
C1	3.9F	0805	1
C2	30 pF	0805	1
C3, C4	30 pF	1210	2
C5, C6	10 uF/100V	1210	2
C7	470 uF/63V		1
R1	10 Ω	0603	1
C8, C10	6.8 pF	0805	2
C9	3.0 pF	0805	1
C11, C13	3.0 pF	1210	2
C12	1.0 pF	1210	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
2024/8/13	**V1.0**	**Preliminary Datasheet Creation**

Application data based on: LSM-24-26

Notice

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