



Gallium Nitride, 200W,4.4-5GHz RF Power Transistor

Description

The GTAH50200BY2 is a 200W 28V, both input and output matched transistor, ideal for any application within

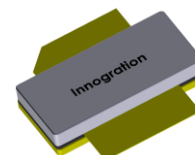
C band 4.4-5.0GHz, It can support both CW and pulsed CW.

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

- Typical performan class AB application circuit with device soldered

Vds=28V Idq=120mA Pulsed CW: 100us,10%

GTAH50200BY2



Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
4400	53.25	211.5	42.9	11.38	54.33	270.9	48.3
4500	53.15	206.4	44.6	12.48	54.31	269.6	49.8
4600	53.01	200.2	46.3	13.15	54.24	265.8	51.3
4700	52.95	197.4	49.4	13.63	54.32	270.7	54.7
4800	52.51	178.4	46.9	13.04	54.04	253.7	52.7
4900	52.23	167.0	44.1	12.31	53.81	240.5	49.7
5000	52.25	168.1	43.0	11.52	53.80	239.6	48.4

Vds=28V Idq=120mA CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
4400	52.42	174.6	39.5	10.52	54.00	251.2	46.2
4500	52.59	181.4	41.7	11.51	53.93	247.2	46.7
4600	52.67	184.8	43.5	12.02	53.83	241.4	47.5
4700	53.02	200.6	47.8	12.18	53.94	247.5	50.7
4800	52.52	178.5	45.1	11.64	53.58	228.0	48.0
4900	52.15	164.2	41.9	11	53.32	214.6	45.0
5000	51.95	156.7	40.1	10.38	53.21	209.4	44.2

Recommended driver: GTAH58030G2

Applications

- C band CW power amplifier
- 5G 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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+150	Vdc



Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	32	Vdc
Maximum gate current	I_{GS}	54	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 $T_C = 25^\circ\text{C}$, at $P_{out}=200\text{W}$ CW at 5GHz	$R_{\theta JC}$	0.6	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=-8\text{V}$; $I_{DS}=54\text{mA}$	V_{DSS}		150		V
Gate Threshold Voltage	$V_{DS}=10\text{V}$, $I_D=54\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS}=28\text{V}$, $I_{DS}=120\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.5		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	5 GHz, $P_{out}=200\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Power gain, Efficiency as function of P_{out}

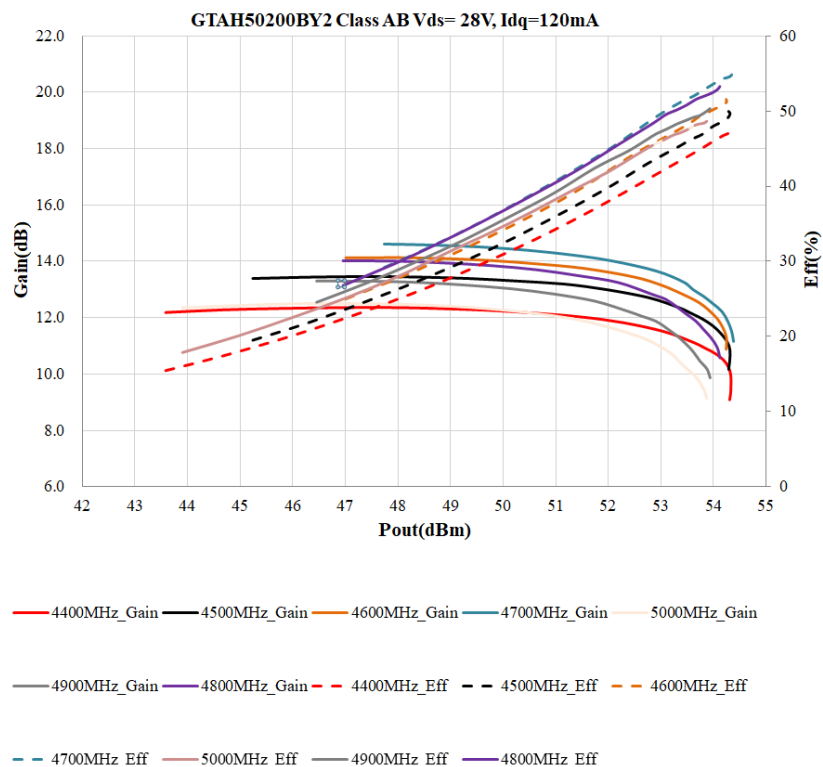


Figure 3: Network analyzer output, S11 and S21

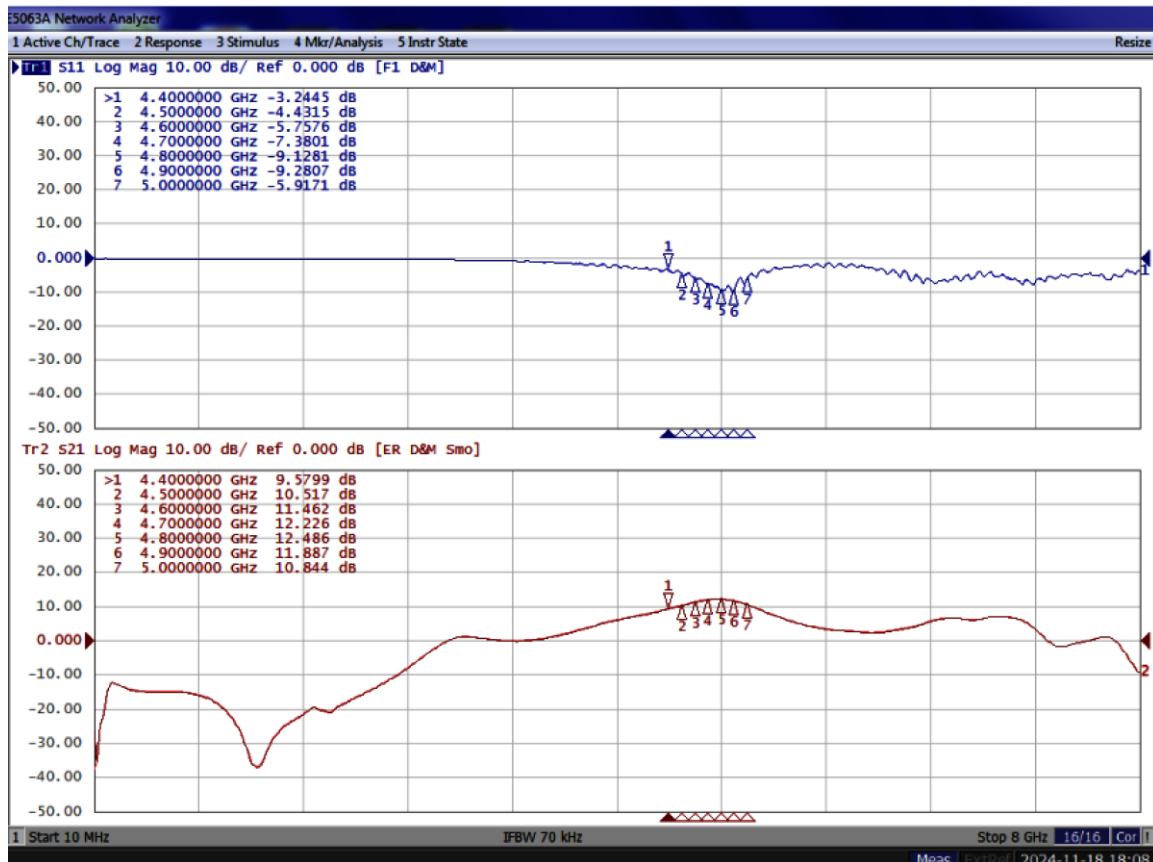


Figure 4: Picture of application board

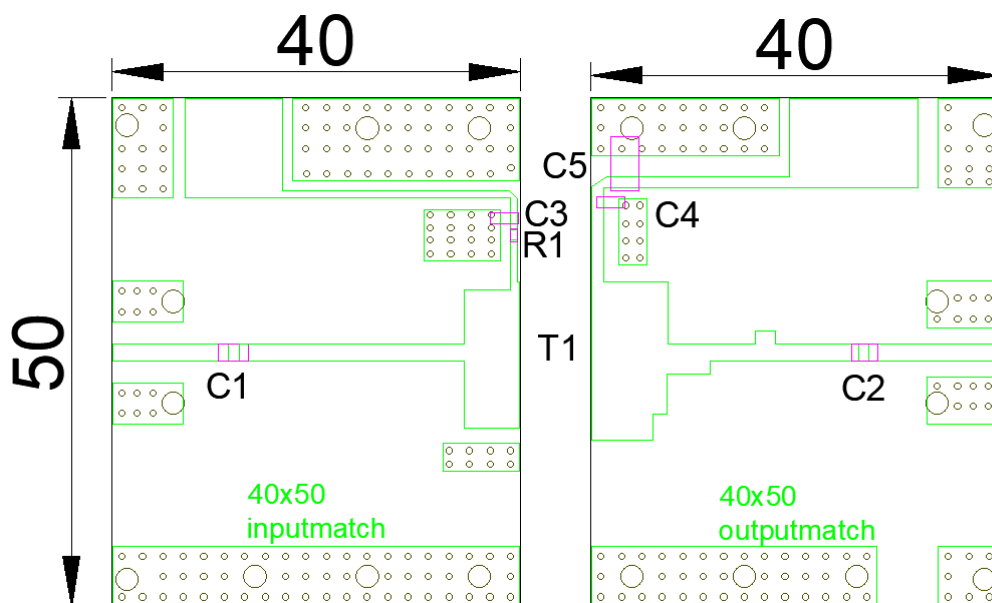




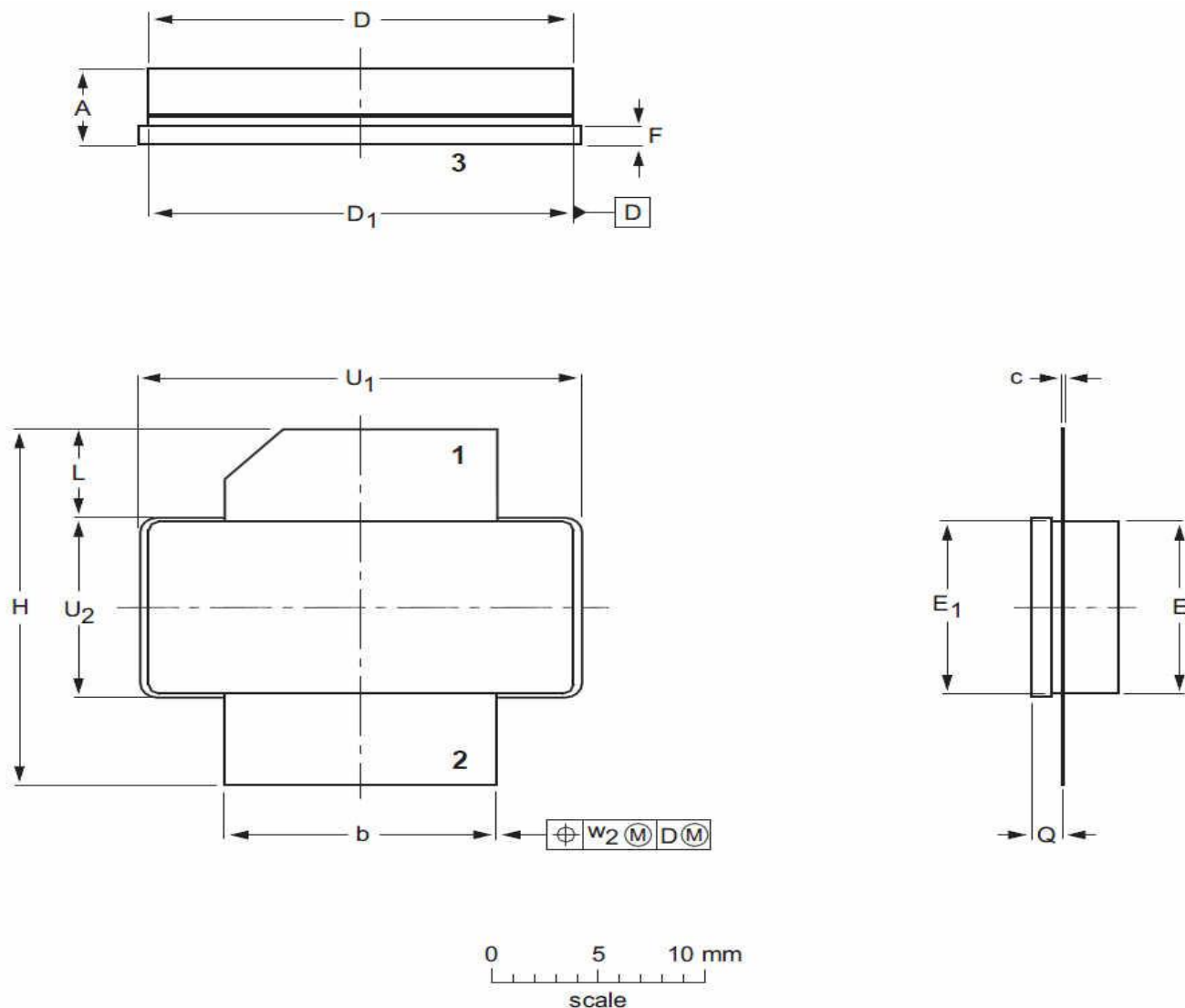
Table 4. Bill of materials of application board (PCB layout upon request)

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4	4	3.9pFHigh Q Capacitor	251SHS3R9BSE	TEMEX
C5	1	10uF MLCC	GRM32EC72A106ME05	Murata
R1	1	10 Ω Power Resistor	ESR03EZPF100	ROHM
T1	1	200W GaN Dual Transistor	GTAH50200BY2	InnogratiOn



Package Outline

Earless flanged ceramic package; 2 leads (1—DRAIN、2—GATE、3—SOURCE)



UNIT	A	b	c	D	D ₁	E	E ₁	F	H	L	Q	U ₁	U ₂	W ₂
mm	4.72	12.83	0.15	20.02	19.96	9.50	9.53	1.14	19.94	5.33	1.70	20.70	9.91	0.25
	3.43	12.57	0.08	19.61	19.66	9.30	9.25	0.89	18.92	4.32	1.45	20.45	9.65	
inches	0.186	0.505	0.006	0.788	0.786	0.374	0.375	0.045	0.785	0.210	0.067	0.815	0.390	0.010
	0.135	0.495	0.003	0.772	0.774	0.366	0.364	0.035	0.745	0.170	0.057	0.805	0.380	

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B2					03/12/2013



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2024/11/18	V1.0	Preliminary Datasheet Creation

Application data based on: LWH-24-43

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