

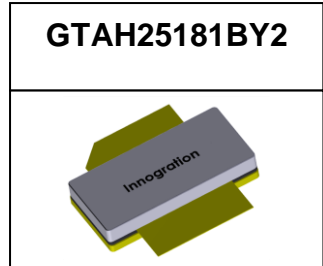


## GaN HEMT 28V, 2450MHz 180W, RF Power Transistor

### Description

The GTAH25181BY2 is a 180W GaN HEMT, designed for ISM/RF Energy application within 2.4-2.5GHz. 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)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Gain(dB)	Eff(%)	2 <sup>nd</sup> (dBc)	3 <sup>rd</sup> (dBc)
2400	38.00	53.05	201.8	9.66	15.1	74.6	-35.0	-50.0
2425	38.25	53.03	200.9	9.57	14.8	75.0	-36.0	-50.0
2450	38.40	53.05	201.8	9.65	14.7	74.7	-37.5	-50.0
2475	38.40	53.10	204.2	9.85	14.7	74.0	-39.2	-50.0
2500	37.75	53.04	201.4	9.88	15.3	72.8	-38.8	-50.0

Vds=32V, Vgs=-3V, CW

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Gain(dB)	Eff(%)
2400	38.60	54.20	263.0	11.20	15.6	73.4
2425	38.55	54.20	263.0	11.20	15.7	73.4
2450	38.70	54.20	263.0	11.20	15.5	73.4
2475	38.75	54.23	264.9	11.30	15.5	73.2
2500	38.30	54.16	260.6	11.23	15.9	72.5

Recommended driver: ITEH38007P3 (LDMOS) or GTAH80008PD(GaN)

### Applications

- S 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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V <sub>DSS</sub>	+150	Vdc
Gate--Source Voltage	V <sub>GS</sub>	-8 to +0.5	Vdc
Operating Voltage	V <sub>DD</sub>	32	Vdc
Maximum gate current	I <sub>GS</sub>	49	mA



Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C
Case Operating Temperature	T <sub>c</sub>	+150	°C
Operating Junction Temperature	T <sub>J</sub>	+225	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA T <sub>c</sub> = 85°C, at P <sub>diss</sub> =90W	R <sub>θJC</sub>	0.9	°C /W

**Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)**

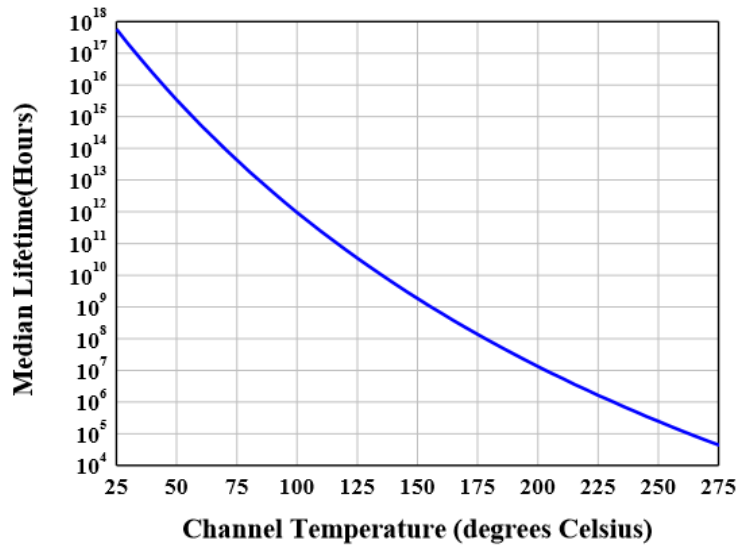
**DC Characteristics ( measured on wafer prior to packaging)**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>GS</sub> =-8V; I <sub>DS</sub> =49mA	V <sub>DSS</sub>		150		V
Gate Threshold Voltage	V <sub>DS</sub> =10V, I <sub>D</sub> = 49mA	V <sub>GS(th)</sub>	-4		-2	V
Gate Quiescent Voltage	V <sub>DS</sub> =28V, I <sub>DS</sub> =500mA, Measured in Functional Test	V <sub>GS(Q)</sub>		-2.5		V

**Ruggedness Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.5GHz, P <sub>out</sub> =180W Pulsed CW All phase, No device damages	VSWR		10:1		

**Figure 2: Median Lifetime vs. Channel Temperature**



## Typical performance

Figure 3: Network analyzer output S11/S21

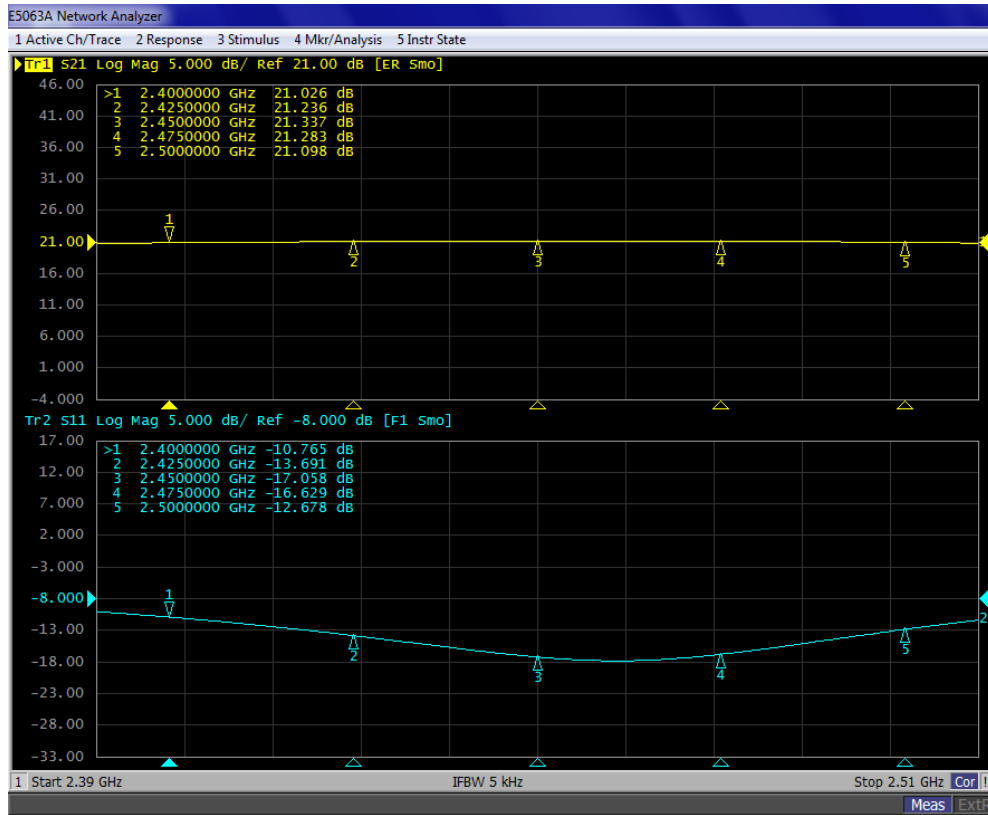


Figure 4: Picture of application board

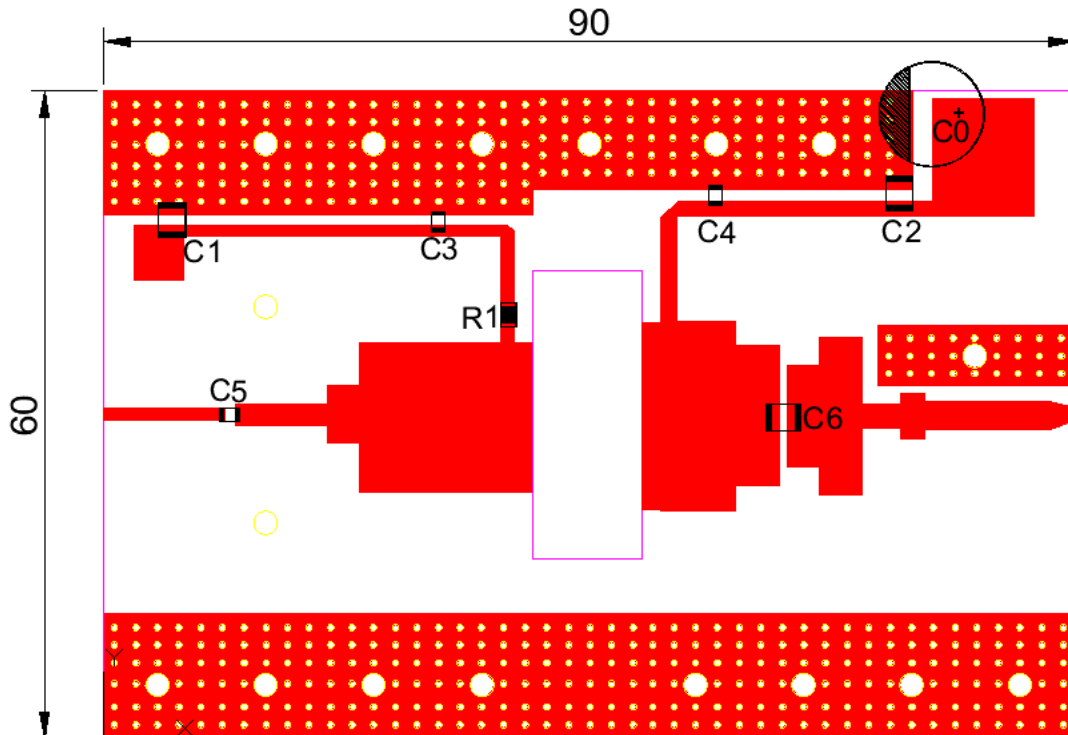




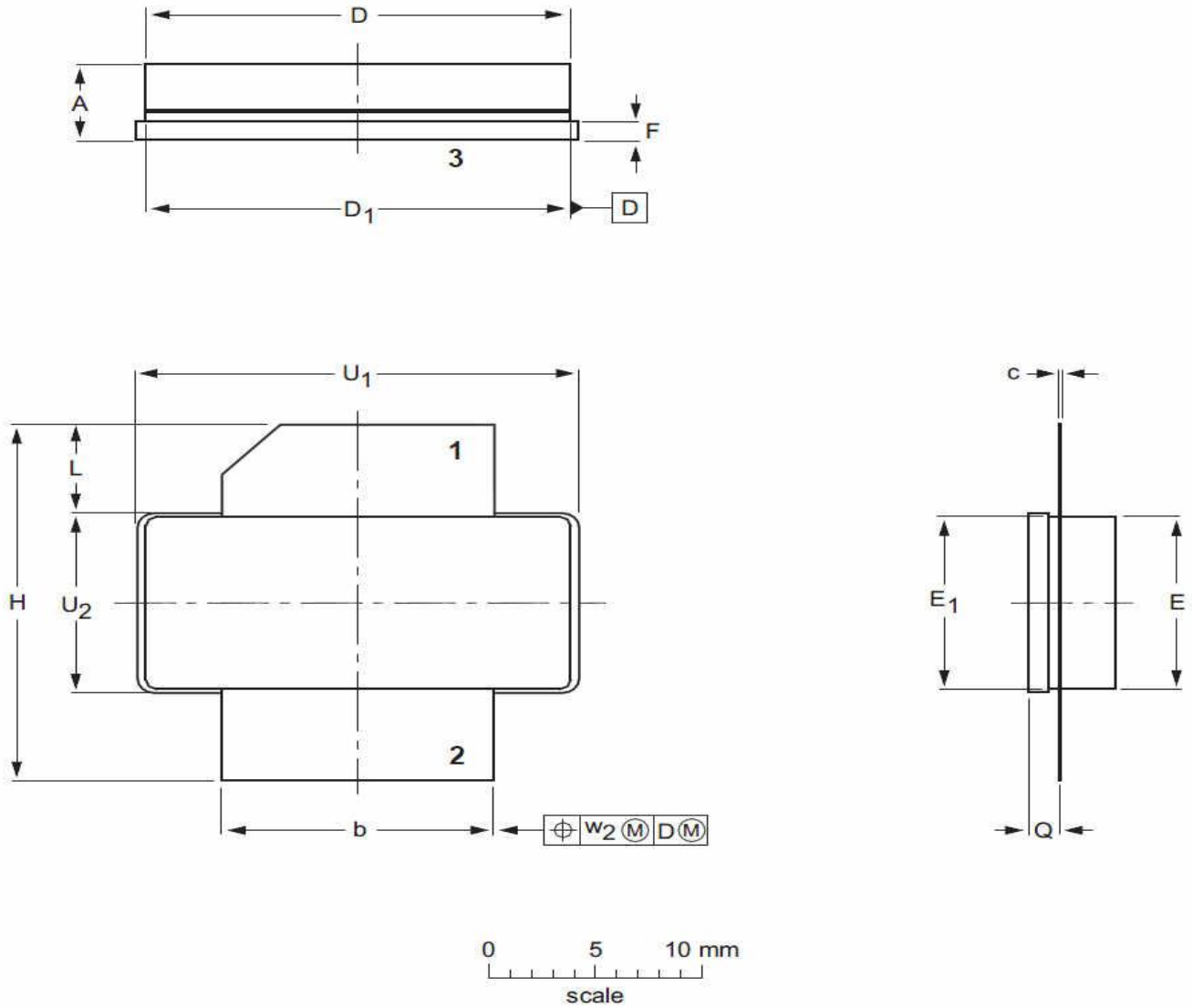
Table 4. Bill of materials of application board (PCB layout upon request)

Component	Description	Suggestion
C0	1000uF/63V	Electrolytic Capacitor
C1, C2	10uF	1210
C3, C4	10pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ200805
C5	8.2pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ200805
C6	8.2pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ101111
R1	Chip Resistor, 10Ω	0805
PCB	Rogers TC350, thickness 20 mils, 1oz copper	



### Package Outline

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



UNIT	A	b	c	D	D <sub>1</sub>	E	E <sub>1</sub>	F	H	L	Q	U <sub>1</sub>	U <sub>2</sub>	W <sub>2</sub>
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
2024/10/23	V1.0	Preliminary Datasheet Creation

Application data based on: RXT-24-48

## Notice

Specifications are subject to change without notice. Innogrations believes the information within the data sheet to be reliable. Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innogrations in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.

Innogrations products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogrations product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility.

For any concerns or questions related to terms or conditions, please check with Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.