

**GaN 100W,2-6GHz ,28~32V,RF Power Transistor****Description**

The STA60100BY4 is a 28V 100W device, both input and output matched GaN HEMT, ideal for multiple applications within 2 to 6GHz. It can support CW and pulse CW , and any other modulation signals

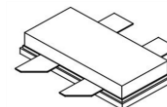
In its typical wideband application, it can deliver 60-70W Psat across the full band of 2 to 6GHz within 28~32V.

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

- Typical performance across 2-6GHz class AB application circuit with device soldered

Vds=32V Vgs=-3.18V Idq=200mA (28V data upon request) and Pin=41dBm data in later pages

Recommended driver: NU5803H/NU5904H, pre-driver: G2MAH0160--8

STA60100BY4

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Gain(dB)	Eff(%)
2000	42.1	49.7	94.2	5.21	7.6	56.5
2100	41.9	49.7	92.5	5.12	7.7	56.4
2200	42.2	49.4	86.7	4.87	7.2	55.6
2300	41.7	49.4	86.9	5.10	7.7	53.2
2400	42.6	49.4	87.1	6.20	6.8	43.9
2500	43.2	50.1	102.6	7.50	6.9	42.7
2600	43.1	49.5	89.7	7.03	6.4	39.9
2700	43.3	50.0	99.8	7.38	6.7	42.2
2800	43.3	50.0	100.0	7.19	6.7	43.5
2900	42.0	50.0	100.0	7.33	8.0	42.6
3000	43.2	50.5	112.2	7.80	7.3	45.0
3100	43.4	50.6	114.6	8.43	7.2	42.5
3200	42.7	49.8	96.2	7.63	7.2	39.4
3300	43.1	49.8	95.5	7.50	6.7	39.8
3400	43.2	50.5	112.7	7.59	7.4	46.4
3500	43.2	50.7	118.0	7.91	7.6	46.6
3600	43.0	50.6	115.3	7.81	7.7	46.2
3700	43.9	50.6	115.9	8.07	6.8	44.9
3800	43.6	50.2	103.5	8.03	6.5	40.3
3900	43.6	50.1	103.0	7.97	6.6	40.4
4000	43.1	50.5	111.4	8.00	7.4	43.5
4100	42.7	50.3	107.6	7.81	7.6	43.1
4200	42.2	50.6	115.1	8.06	8.4	44.6
4300	40.9	49.9	97.9	7.00	9.0	43.7
4400	40.8	49.2	83.6	6.09	8.4	42.9
4500	41.5	49.2	83.4	5.91	7.7	44.1
4600	41.9	49.2	83.2	5.81	7.3	44.7
4700	41.5	49.1	80.5	5.57	7.6	45.2
4800	41.4	49.4	86.1	5.53	7.9	48.7
4900	41.6	49.3	85.5	5.98	7.8	44.7
5000	41.6	49.6	90.4	5.83	8.0	48.4



5100	41.8	49.5	88.3	5.66	7.7	48.8
5200	42.0	49.3	84.1	5.55	7.3	47.4
5300	42.2	49.2	83.8	5.68	7.0	46.1
5400	42.0	49.0	79.8	5.68	7.0	43.9
5500	41.8	49.1	80.4	5.85	7.2	42.9
5600	41.6	49.2	83.0	5.92	7.6	43.8
5700	41.1	49.2	82.4	6.60	8.1	39.0
5800	41.0	49.1	81.3	7.04	8.1	36.1
5900	41.0	49.1	82.0	6.98	8.1	36.7
6000	41.0	49.1	80.7	6.87	8.1	36.7

Applications

- S and C band power amplifier
- 5G wideband 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)

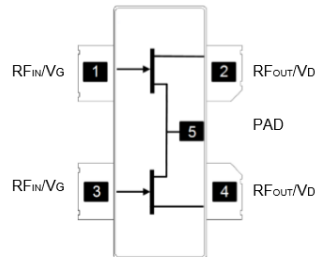


Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum gate current	I_{gs}	25.2	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	$R_{\theta JC}$	1.2	°C /W



T_C= 25°C, at P_{out}=100W CW at 4GHz

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 _{GS} =-8V; I _{DS} =25.2mA	V _{DSS}		150		V
Gate Threshold Voltage	V _{DS} =10V, I _D = 25.2mA	V _{GS(th)}	-4		-2	V
Gate Quiescent Voltage	V _{DS} =28V, I _{DS} =200mA, Measured in Functional Test	V _{GS(Q)}		-3.1		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	4GHz, P _{out} =100W Pulsed CW All phase, No device damages	VSWR		10:1		

Typical performance

2000-6000MHz

Figure 3: Picture of application board ,class AB

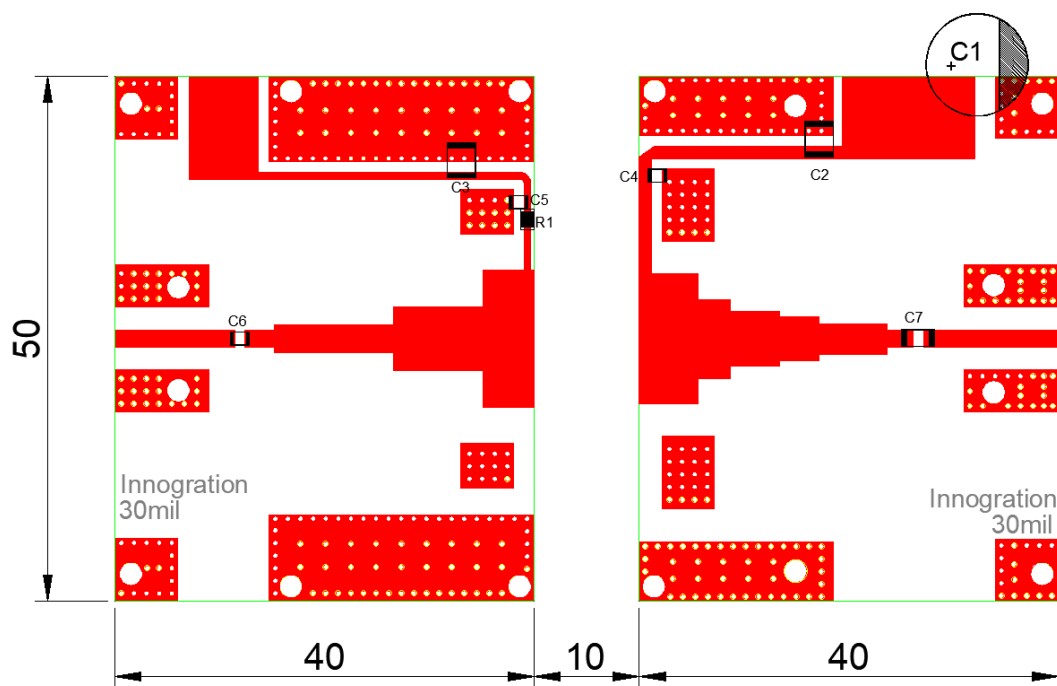
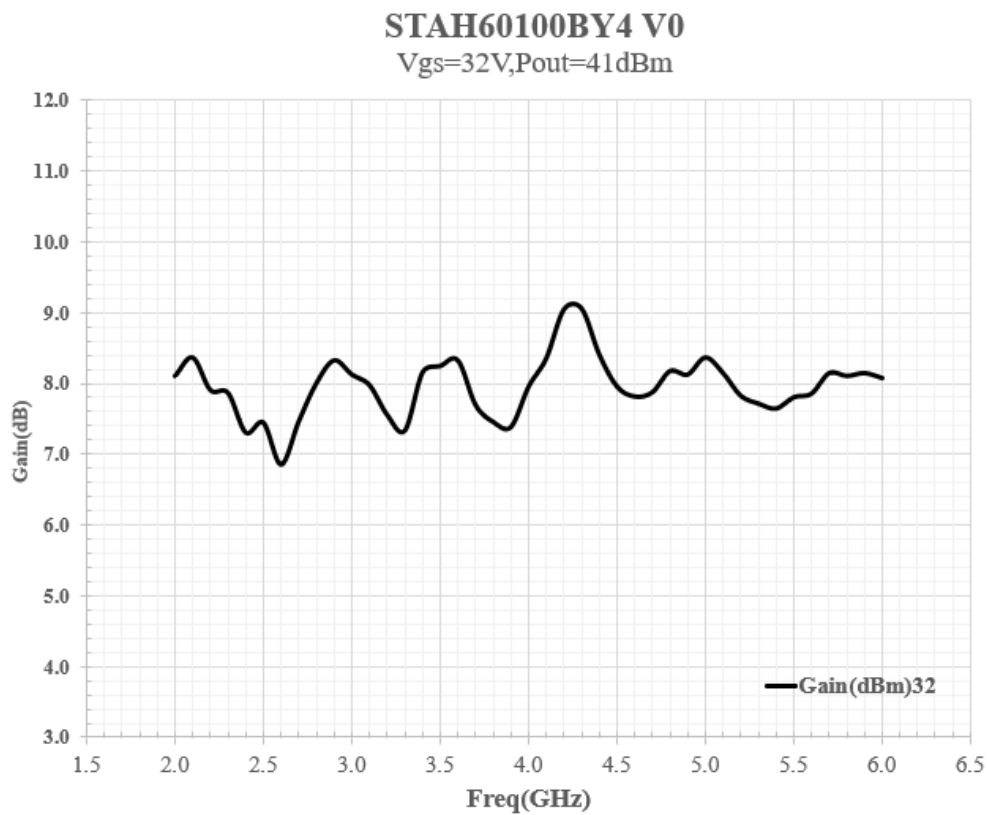
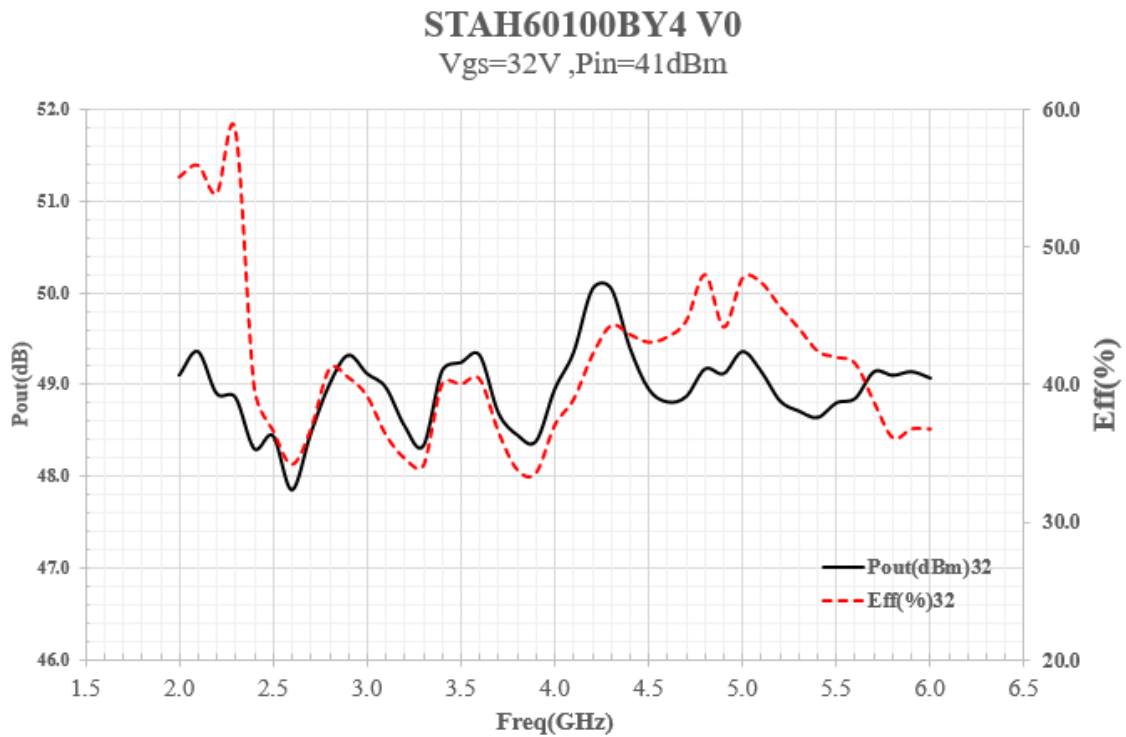


Table 4. Bill of materials of application board (PCB layout upon request)

Component	Description	Suggestion
C1	2200uF/63V	
C2,C3	10uF	1210
C4,C5,C6	5.1pF	MQ300805
C7	4.7pF	MQ301111
R1	Chip Resistor,10Ω	0805
PCB	30 mil Rogers 4350b	

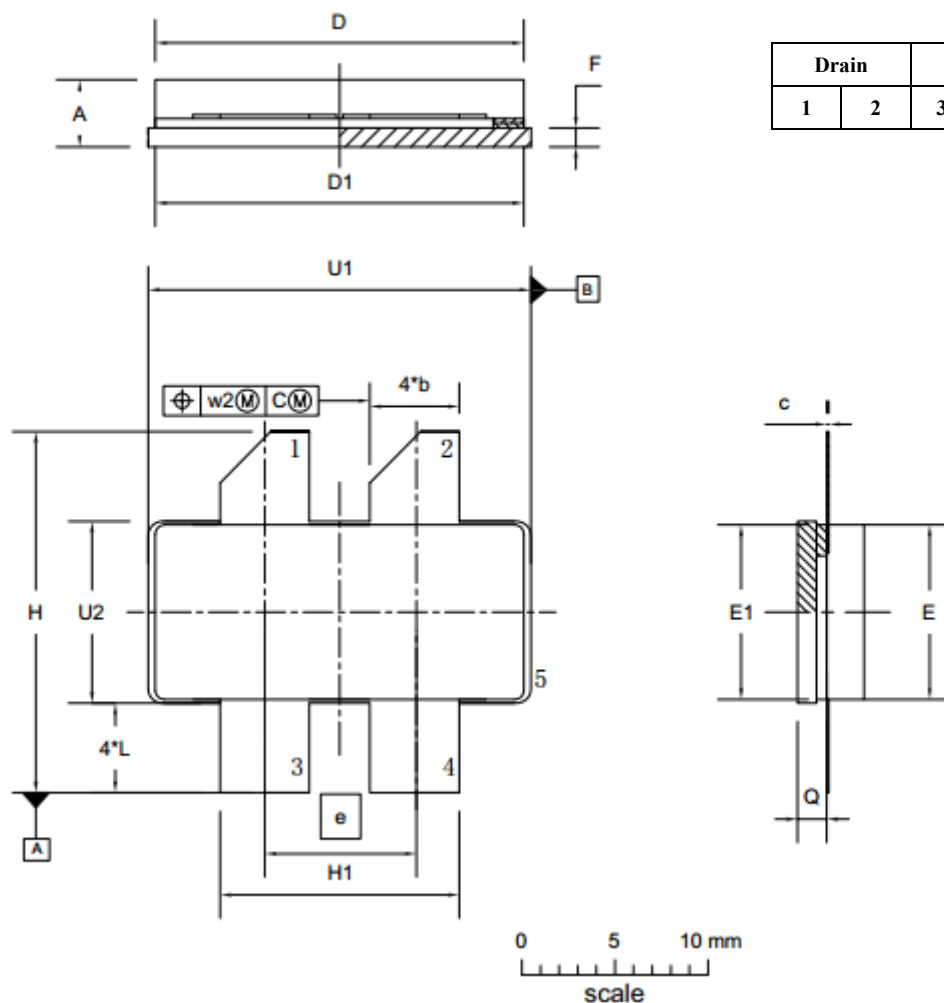


Figure 4: Output Power/Power Gain/Efficiency across the band under Pin=41dB at Vdd=32V





Earless Flanged Ceramic Package; 4 leads



Drain		Gate		Source
1	2	3	4	5

UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	Q	U ₁	U ₂	W ₁	W ₂
mm	4.72	4.67	0.15	20.02	19.96	7.90	9.50	9.53	1.14	19.94	12.98	5.33	1.70	20.70	9.91	0.25	0.51
	3.43	4.93	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.73	4.32	1.45	20.45	9.65		
inches	0.186	0.194	0.006	0.788	0.786	0.311	0.374	0.375	0.045	0.785	0.511	0.210	0.067	0.815	0.390	0.01	0.02
	0.135	0.184	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.501	0.170	0.057	0.805	0.380		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4					03/12/2013



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/12/6	V1.0	Product Datasheet Creation , change initial sample name to STAH60100BY4
2024/11/15	V1.1	Modify the typo of naming from GTAH to STAH

Application data based on: RXT-23-48

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.