

BSTGPA41-0203P GaN

Internally Matched Power Amplifier

Data Sheet

I. Product Introduction

BSTGPA41-0203P is a gallium nitride high electron mobility transistor (GaN HEMT). It features a multi-stage, high-gain, high-power internally matched power transistor with built-in bias circuitry and DC-blocking capacitors. It can operate in pulsed/continuous wave modes at saturated power and is designed for use in standard communications and radar frequency bands, providing optimal power and gain performance in 50Ω systems.

II. Performance Characteristics

- Covers the operating frequency range: 2.7~3.1GHz
- Good 50Ω impedance matching, easy to cascade
- Metal ceramic tube sealed package
- Screw-fixed flange package or welded pill package
- 0.25um GaN HEMT technology

III. Electrical Performance Table

Working conditions: 50Ω test system, $T_A = +25^\circ\text{C}$, $V_{DS} = +28\text{V}$, $I_{DSQ} = 30\text{mA}$, 100us 10% duty cycle.

Table 1.

PARAMETER NAME	TEST CONDITIONS		MINIMUM	TYPICAL	MAXIMUM	UNIT
P_{SAT}	Freq.=2.7GHz~3.1GHz $V_{GS}=-2.85\text{V}$ $V_{DS}=+28\text{V}$ $I_{DSQ}=30\text{mA}$		-	41.5	-	dBm
Power gain			-	29	-	dB
Power added efficiency			-	58	-	%
Gain flatness			-	-	1	dB
pinch-off voltage	$V_{DS}=6\text{V}$	$I_{DS} \leq 100\text{mA}$	-8	-	-4	V

Gate-source reverse current	$V_{DS}=0V$	$V_{GS}=-10V$	-	-	5	μA
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Note: Final technical indicators and dimensions are subject to the technical agreement. Products with similar power specifications, higher efficiency, and wider bandwidth can be customized.

IV. Absolute Maximum Ratings

Table 2.

PARAMETER	LIMIT VALUE
Source-drain voltage V_{ds}	+120V
Gate-source voltage V_{gs}	-10V
Operating temperature	-40 °C ~+85 °C
Power dissipation ($T_c=25$ °C)	10W
Storage temperature	-65 °C ~+150 °C

V. Main Indicator Tests

5.1. Test conditions: $T_A = +25^{\circ}C$, $V_{DS} = +28V$, $V_G = -2.85V$, $I_{DS} = 30mA$, 100us 10% duty cycle.

Table 3

FREQUENCY (GHZ)	INPUT POWER (DBM)	OUTPUT POWER (DBM)	GAIN (DB)	EFFICIENCY(%)	SECOND HARMONIC SUPPRESSION (DBC)
2.7	13	41.4	28.4	62	21
2.8	12	41.4	29.4	63	22
2.9	12	41.5	29.5	63	23
3.0	12	41.4	29.4	63	24
3.1	12	41.5	29.5	65	-25

5.2. Test conditions: $T_A = +85^{\circ}\text{C}$, $V_{DS} = +28\text{V}$, $V_G = -2.89\text{V}$, $I_{DS} = 30\text{mA}$, 100us 10% duty cycle

Table 4

FREQUENCY (GHZ)	INPUT POWER (DBM)	OUTPUT POWER (DBM)	GAIN (DB)	EFFICIENCY(%)	SECOND HARMONIC SUPPRESSION (DBC)
2.7	14	41.1	27.4	54	-20
2.8	12	41	29	55	-20
2.9	12	41.2	29.2	56	21
3.0	12	41.1	29.1	55	22
3.1	14	41.2	27.2	58	23

5.3. Test conditions: $T_A = -40^{\circ}\text{C}$, $V_{DS} = +28\text{V}$, $V_G = -2.8\text{V}$, $I_{DS} = 30\text{mA}$, 100us 10% duty cycle

Table 5

FREQUENCY (GHZ)	INPUT POWER (DBM)	OUTPUT POWER (DBM)	GAIN (DB)	EFFICIENCY(%)	SECOND HARMONIC SUPPRESSION (DBC)
2.7	12	41.6	30.6	64	22
2.8	11	41.5	30.5	64	22
2.9	11	41.7	30.7	65	24
3.0	11	41.5	30.5	65	24
3.1	11	41.5	30.5	66	-26

5.4. Test Conditions: $T_A = +25^{\circ}\text{C}$, $V_G = -2.7\text{V}$, $V_{DS} = +28\text{V}$, $I_{DS} = 200\text{mA}$

5.4.1. S11 Test Curve



Figure 1

5.4.2. S22 Test Curve

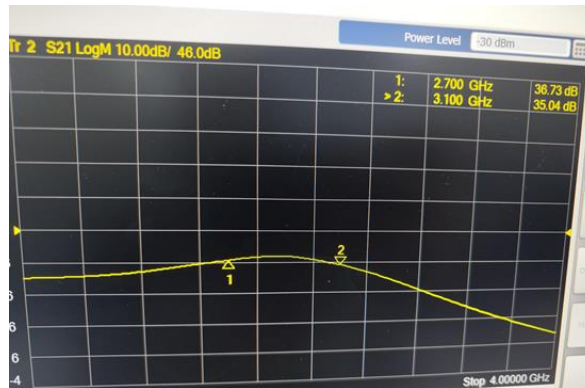


Figure 2

VI. Dimensions, Recommended Circuit Diagram

6.1. Shell and Tube

Note: The unit in the figure is millimeter (mm), polarity: cut-angle end - gate; flat-angle end - drain.

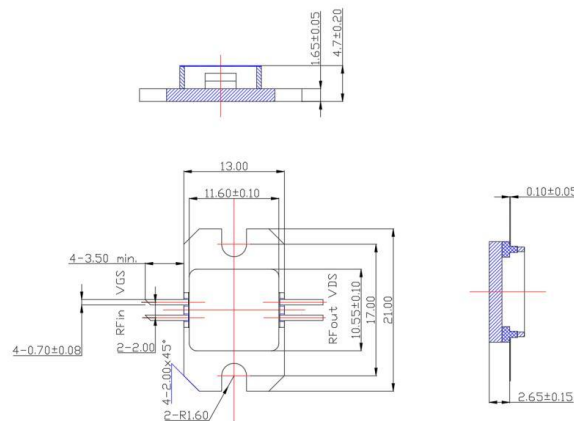


Figure 3

6.2. Recommended Application Circuit Schematic

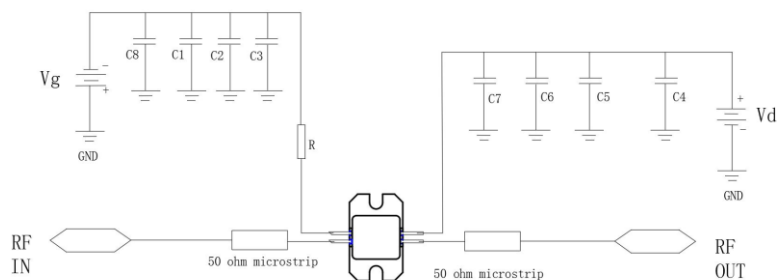


Figure 4

Table 6.

COMPONENTS	SPECIFICATION	REMARK
C1, C5	4.7uF	0805
C2, C6	10nF	0805
C3, C7	1000pF	0805
C4	470uF	
C8	47uF	
R	20Ω	0805
Plate	RO4350B	Rogers
Plate thickness	0.762mm	
Dielectric constant	3.48	

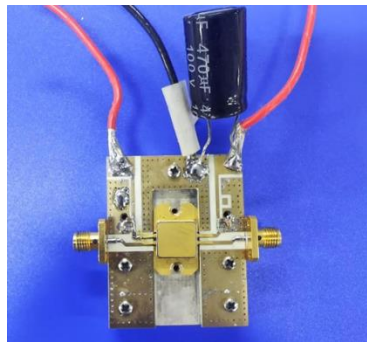


Figure 5

VII. Recommended Installation

- After the screws are tightened on the shell, the height between the shell pin and the printed circuit board should be $\geq 0.1\text{mm}$, the shell should be installed in the center, the slot width should be $\geq 13.1\text{mm}$, and the clearance between the input and output ends should be $> 0.1\text{mm}$, otherwise the pins may fall off. It can also be soldered.
- We recommend using M2.5 screws and assembling with a torque of 0.6 N·m. Anti-loosening measures should be implemented, such as spring washers, thread lockers, or glue on the caps. Soldering is recommended, with a temperature not exceeding 220°C.
- When the device is working, the case temperature does not exceed 85 °C.

Notes:

- This device is an internally matched device with an input and output impedance of 50Ω.
- When applying power, please strictly follow the order of negative voltage first and then positive voltage; when powering on, increase the grid voltage first and then the drain voltage; when removing power, reduce the drain voltage first and then the grid voltage.
- Pay attention to heat dissipation during use. The lower the shell temperature, the longer the service life of the device.
- During use, instruments and equipment should be well grounded. This product is an electrostatic sensitive device, so please be careful to prevent static electricity during storage and use. Please select the power supply reasonably according to the specific modulation method and corresponding requirements.