BSTGPA57-0203P

GaN Internally Matched Power Amplifier

Data Sheet

I. Product Introduction

BSTGPA57-0203P is a gallium nitride high electron mobility transistor (GaN HEMT). It is a high-power internally matched power transistor that can operate in pulse mode at saturated power. It is used in standard communication and radar frequency bands and provides optimal power and gain performance in a 50Ω system.

II. Performance Characteristics

- Working frequency range: 2.7~3.1GHz
- Good 50Ω impedance matching, easy to cascade
- Metal ceramic tube sealed package
- Adopt screw-fixed flange package or welded pill package
- 0.45um Power GaN HEMT Technology

III. Electrical Performance Table:

Working conditions: 50Ω test system, T_A = +25℃, V_{DS} = +50V, I_{DS} = 100mA, pulse width: 100us, 10% duty cycle.

Table 1

PARAMETER NAME	TEST CONDITIONS		MINIMUM	TYPICAL	MAXIMUM	UNIT
Saturation power	Freq.=2.7GHz~3.1GHz V_{GS}=-3.0~-4.0V V_{DS}=+50V IDsq=100mA		-	57.9	-	dBm
Power gain			-	13.9	-	dB
Power added efficiency			57	-	-	%
Power flatness			-	-	0.8	dB
pinch-off voltage	V_{DS}=6V	I_{DS}≤100mA	-8	-	-4	V
Gate-source reverse current	V_{DS}=0V	V_{GS}=-10V	-	-	5	uA

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}	+160V
Gate-source voltage V_{gs}	-10V
Operating temperature	-50℃~+85℃
Power dissipation (T_c=25℃)	490W
Storage temperature	-65℃~+150℃

V. Main Indicator Tests:

1. Test conditions: T_A = +25℃, V_{DS} = +50V, V_{GS} = -3.5V, I_{DS} = 100mA, pulse width: 200us, 10% duty cycle.

Table 3

FREQUENCY (GHZ)	INPUT POWER (DBM)	OUTPUT POWER (DBM)	GAIN (DB)	SATURATION EFFICIENCY (%)	SECOND HARMONIC (DBC)
2.7	44	57.8	13.8	62	-40
2.8	44	57.9	13.9	62	-42
2.9	44	57.9	13.9	60	-43
3.0	44	57.6	13.6	64	-43
3.1	44	57.3	13.3	62	-41

2. Test conditions: T_A = +25℃, V_{DS} = +50V, V_{GS} = -3.35V, I_{DS} = 800mA.

Figure 1. S11 curve graph

Figure 2. S21 curve graph

VI. Dimensions, Recommended Circuit Diagram

6.1. Shell And Tube

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

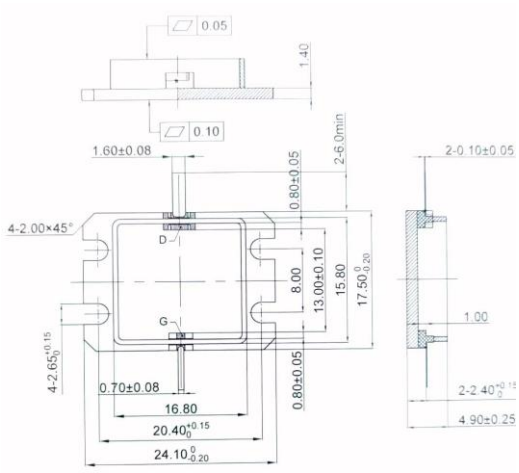

Figure 3

6.2. Recommended Application Circuit Diagram

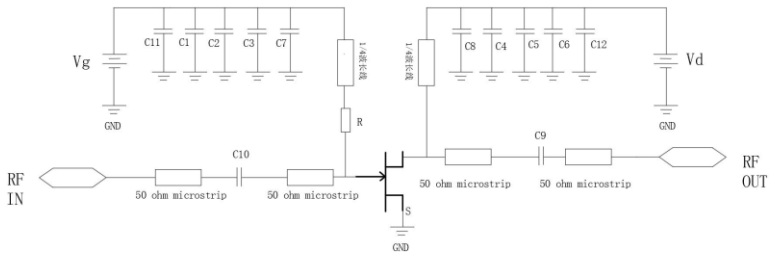

Figure 4

Table 4

COMPONENTS	SPECIFICATION	REMARK
C7, C8, C9, C10	10pF	0805
C3,C4	1000pF	0805
C2,C5	10nF	0805
C1,C6	4.7μF	0805
C11	47μF	
C12	2200μF	
R	20Ω	0805
Plate	4350B	Rogers
Plate thickness	0.762mm	
Dielectric constant	3.48	

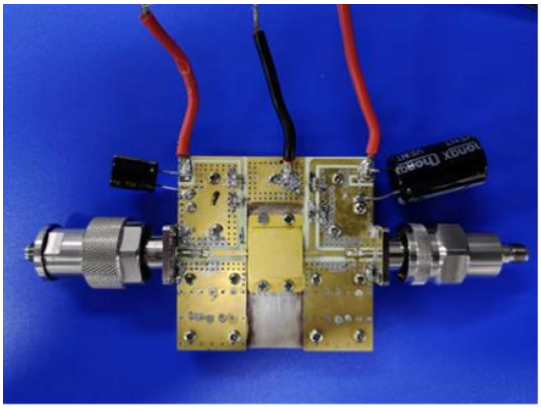

Figure 5

6.3. Recommended Installation

- After the shell is tightened with screws, the height between the shell pin and the printed circuit board should be ≥0.1mm, the shell should be installed in the center, the slot width should be ≥17.68mm, and the clearance between the input and output ends should be > 0.1mm, otherwise the pins may fall off.
- We recommend using M2 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 applied to the caps. Soldering is recommended, with a temperature not exceeding 220°C.
- When the device is working, the case temperature does not exceed 75℃.

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.