XINHUO FUTURE BRAND

Innovation worldwide, Empowering the future with "CHINA-IC"

About Xinhuo Future

IC Space (Shenzhen Xinhuo Future Technology Co., Ltd.) is a professional technology company specializing in electronic component distribution, chip design & manufacturing, and reusable component recovery.

With years of global supply chain experience, we provide a wide portfolio of semiconductor products covering major international brands, including **CPU, FPGA, MCU, network interface chips, MOSFETs, power management ICs, sensors, and memory devices**. Our main brands include Broadcom, Xilinx, Altera, Micron, ST, TI, and Freescale, supported by strong inventory and a complete supply network with same-day shipping availability.

Beyond distribution, we also offer product solution design, OEM & ODM services, delivering customized development and mass production based on customer requirements. Our capabilities cover the entire lifecycle—from circuit design, validation, engineering samples to volume manufacturing—helping clients shorten development cycles and achieve efficient, integrated "design-to-production" solutions.

Product Catalog

1. Dominant Brand Supply

BROADCOM

XILINX

altera

MICROCHIP

TEXAS INSTRUMENTS

NVIDIA.

life.augmented

Infineon

BAREFOOT NETWORKS

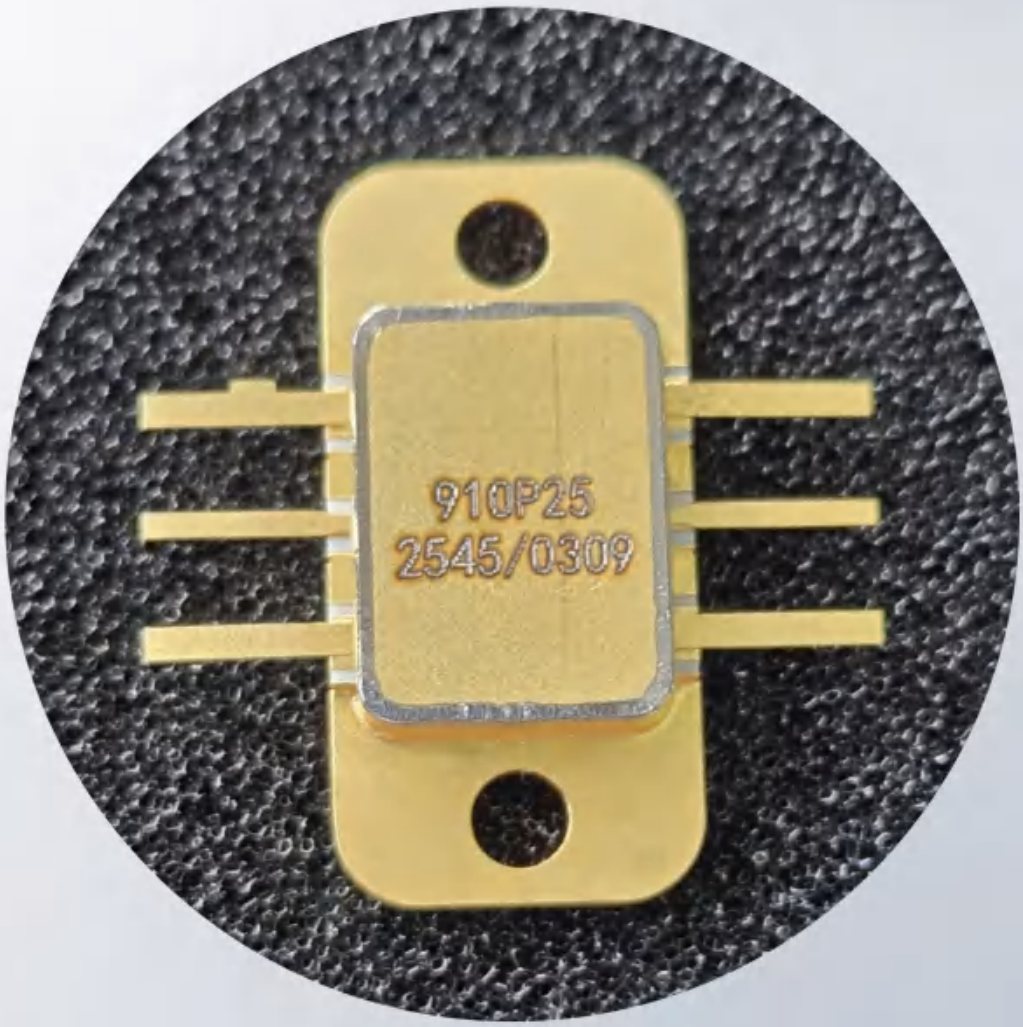
NXP

For other brands and models besides those listed above, please contact Xinhuo Future.

2. Xinhuo Future Brand

We can provide customized development and mass production services according to customer needs.

2.1 GaN MMIC Power Amplifier

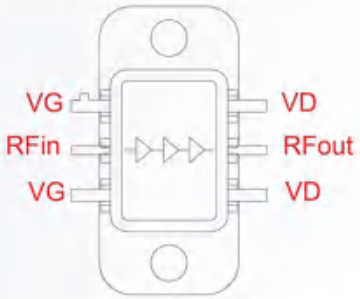


-XH910P25(Alternative models NDNM02128)

Performance characteristics

- Frequency range: 9GHz to 10GHz
- Power gain: 24.5dB
- Saturated output power: 44.5dBm
- Power added efficiency: 43%
- +28V@1.9 A (static)
- Encapsulation size: 18.03mm×8.70mm×2.23mm

functional block diagram



Product Introduction

The 910P25 is a high-efficiency, high-linearity, high-power amplifier package based on GaN HEMT transistors, fabricated using 0.25μm GaN power MMIC process, with built-in DC-blocking capacitors. It operates across a frequency range of 9GHz to 10GHz, with a power gain greater than 24.5dB and a saturation output power greater than 44.5dBm. The typical power add-on efficiency is 43%, and it can operate in continuous wave mode. It features dual power supply, with a typical operating voltage of Vd=+28V and Vg=-2V.

DC parameters (T_A = +25 °C)

metric	symbol	Least value	Representative value	Crest value	Unit
Gate operating voltage	Vg	--	-2	--	V
Drain operating voltage	Vd	--	28	--	V
Static drain current	Id	--	1.9	--	A
Dynamic drain current	Idd	--	2.5	2.9	A
Static gate current	Ig	--	0.1	1	mA
Dynamic gate current	Igg	--	1	--	mA

Microwave electrical parameters (T_A =+25℃, Vd=+28B, Vg=-2B, pulse test, period 1ms, duty cycle 10%)

metric	symbol	Least value	Representative value	Crest value	Unit
Frequency range	f		9-10		GHz
Saturated output power	Psat	44.5	44.6	45.1	dBm
Power gain	Gp	24.5	24.6	-	dB
Power gain flatness	△Gp	-	-	±1	dB
Power added efficiency	PAE	41.8	43	46	%
Linear gain	Gain	-	33.5	33.7	dB
Linear gain flatness	△Gain		--	±1	dB
Input standing wave	VSWR(in)		1.7	2.1	-

Note:

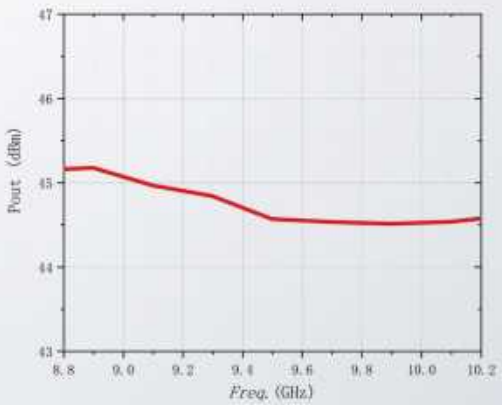
1) All chips have undergone 100% DC and 100% RF in-chip testing.
2) Pin Unless otherwise specified, the curve test conditions in this manual are: Vd=+28V, Vg=-2V, =20dBm, pulse test, period 1ms, duty cycle 10%.

Use limit parameters

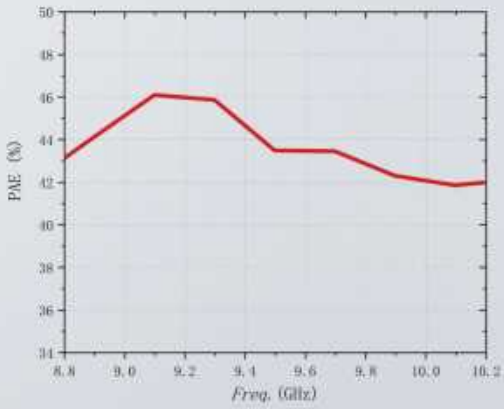
Parameter	symbol	Extreme
Maximum drain source voltage	Vd	+36V
Minimum gate source voltage	Vg	-6V
Maximum input power (CW)	P_p	+30dBm
Storage temperature	T_{STG}	-65℃～+150℃
Maximum operating channel temperature	T_{op}	+225℃
Load impedance mismatch	Z_0	6：1
Pulse limiting		Cycle: 25ms, Duty Cycle: 30%

Typical curve (Vd=+28V, Vg=-2V, pulse test, period 1ms, duty cycle 10%)

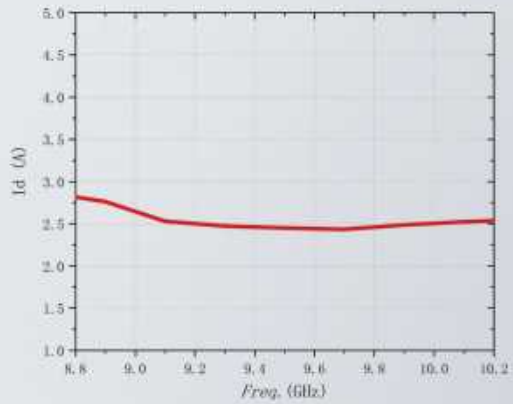
Saturated output power/efficiency vs. frequency
(P_{in}=20dBm)



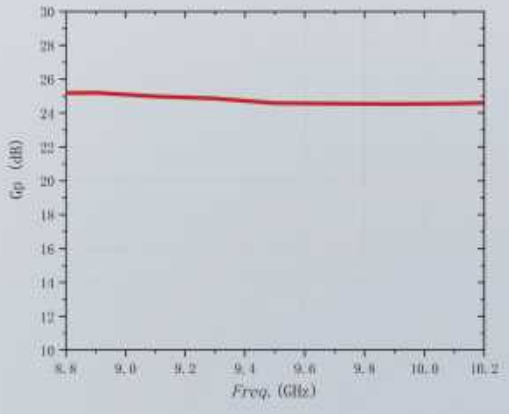
Power added efficiency vs. frequency
(P_{in}= 20dBm)



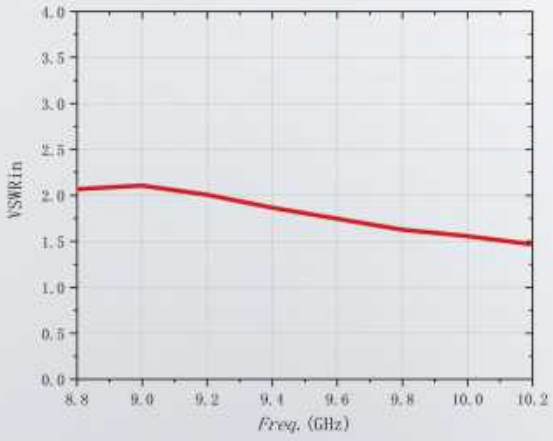
Drain dynamic current vs. frequency
(P_{in}= 20dBm)



Power gain vs. frequency
(P_{in}= 20 dBm)



Enter standing wave vs. frequency
(P_{in}= -30 dBm)



Small Signal Gain vs. Frequency
(P_{in} =-30dBm)

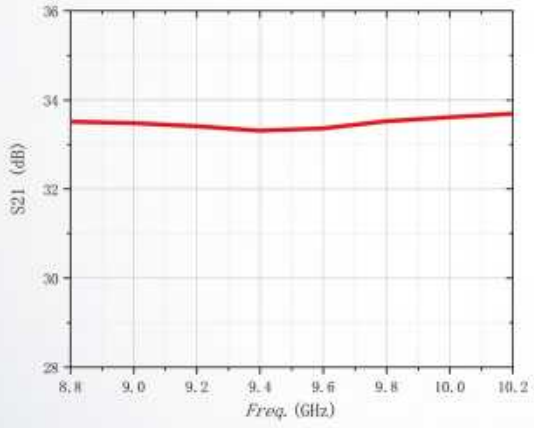
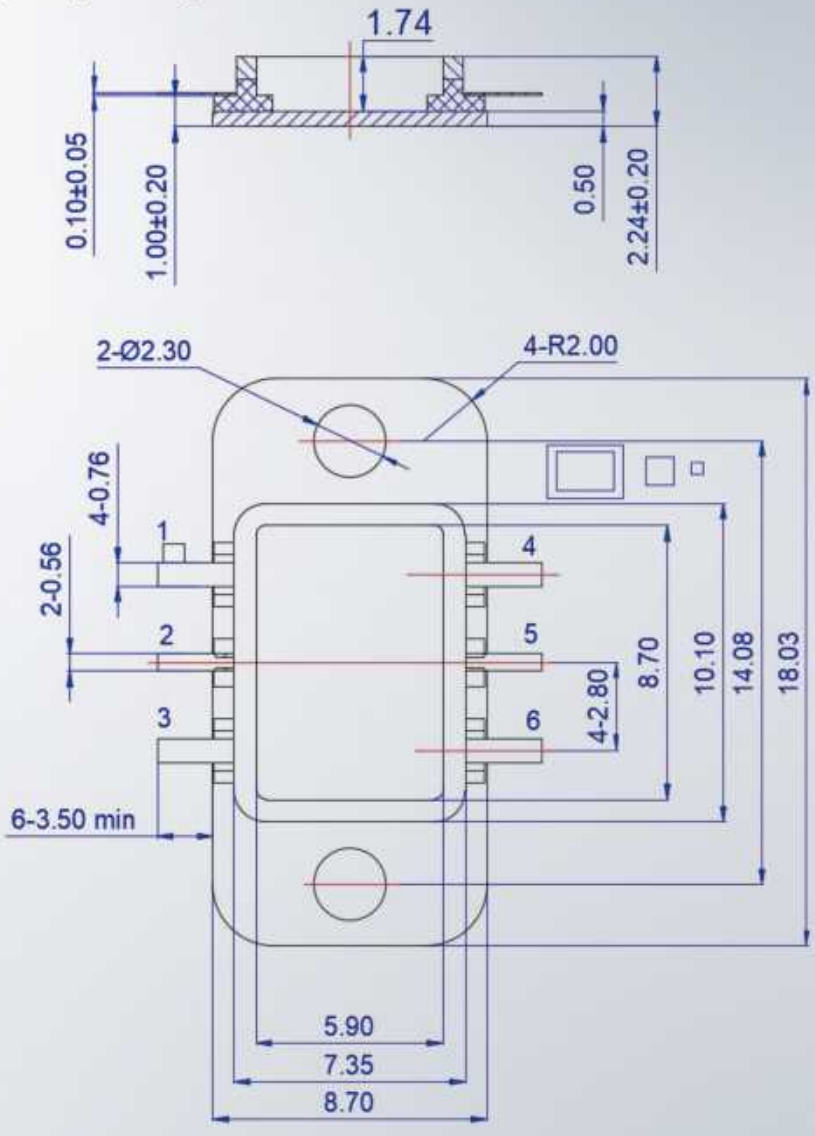


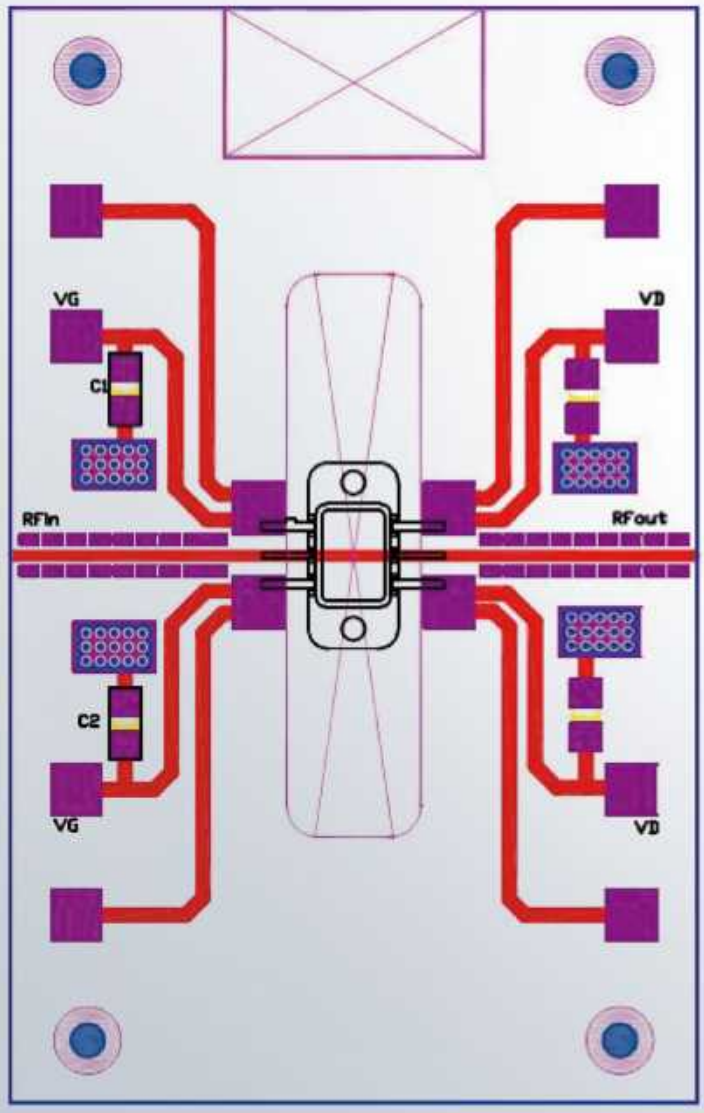
Diagram of the External Dimensions and the Arrangement of the Pressure Points

910P25 dimensions and key arrangement diagram



Note: Drain polarity: 4,6-Drain 1,3-Gate 2-RF input 5-RF output

910P25 Application Reference Circuit



Note:

The capacitance values for the peripheral capacitors are C1= 10uF and C2 = 10uF.Single-layer ceramic capacitors are recommended.

During operation, ensure proper grounding of instruments and equipment.

Matters Need Attention

1) low temperature solder is used in assembly;
2) Pay attention to heat dissipation during operation, the lower the shell temperature, the longer the service life of the device;
3) The recommended operating temperature of the device is not higher than 75℃, otherwise the device will deteriorate and shorten its service life.
4) During operation, instruments and equipment must be properly grounded.
5) This product is an electrostatic sensitive device, so pay attention to anti-static during storage and use.
6) If you have any questions, please contact the supplier.

This product is sensitive to staticelectricity.
Please take precautions against static during use.

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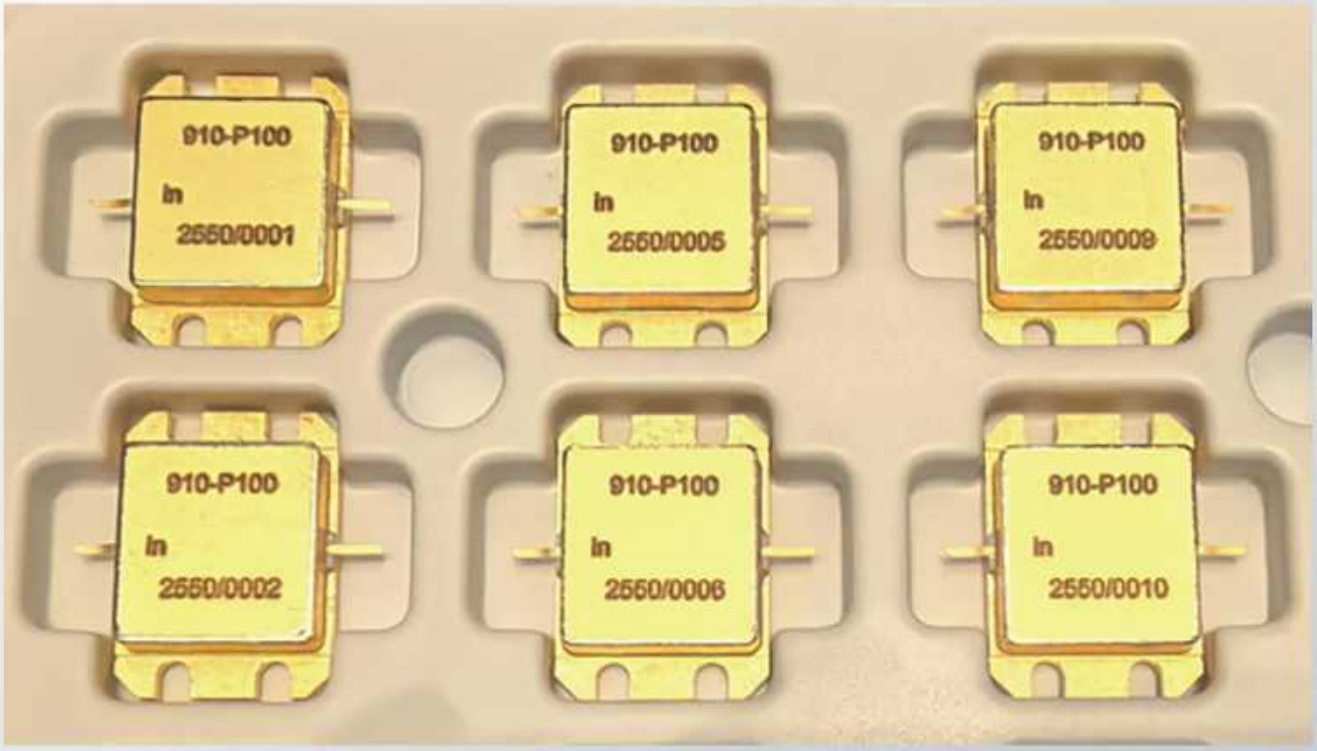
2.2 GaN intemal matching power transistor



-XH910P100（Alternative models NDNM01021）

Performance characteristics

- Band: 9.0GHz~10.0GHz
- Power gain: 7.5dB
- Output power: 50.0dBm
- Power added efficiency: 36%
- Encapsulation type: QF136PE

Product Introduction

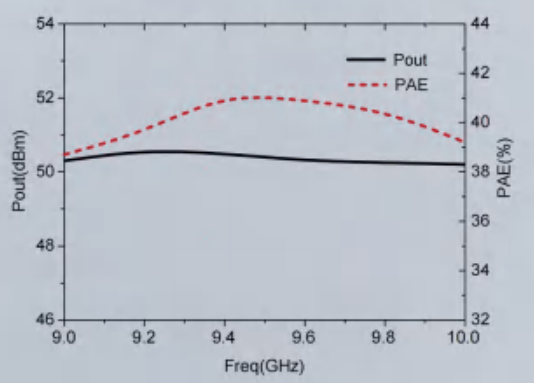
The 910P100 is an internally matched GaN power tube with a working frequency range covering 9.0GHz~10.0GHz, a typical output powe of 50.0dBm, and a power gain of 7.5dB, providing optimal power and gain performance in a 50 ohm system for standard communication bands.

Electrical parameters (TA = +25℃)

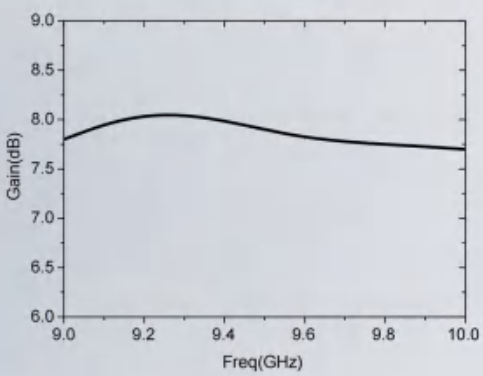
metric	symbol	Test condition	Extreme			Unit
			Least value	Representative value	Crest value	
Pinch-off voltage	V_p	V_{DS}=6.0V，I_{DS}≤80mA	-4.0	-	-1.5	V
Gate cutoff current	I_{GSS}	V_{DS}=0V，V_{GS}=-10V	-	-	5	mA
Output power	P_{sat}	f=9.0～10.0GHz V_{DS}=24 V，V_{GS}=-3.0～-1.точка между 5 В Pin=42.5dBm CW	50.0	-	-	dBm
Power gain	G_p		7.5	-	-	dB
Power added efficiency	η		36	-	-	%
Gain flatness	ΔG_p		-	-	±0.5	dB

Typical curve (TA = +25℃)

Power / Efficiency vs. Frequency

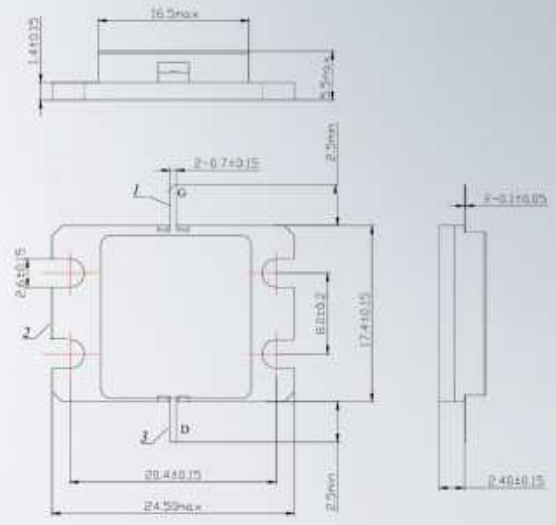


power gain vs. frequency



Physical Parameter

Diagram of the outer dimensions of the tube and shell

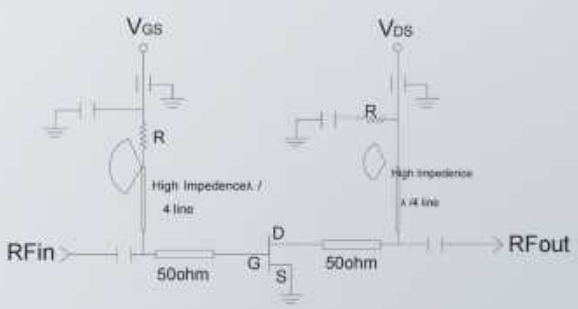


Note: The unit in the figure is millimeters.

Use the limit parameter (TA = +25℃)

metric	symbol	Extreme	Unit
Drain-source voltage	V_{DS}	32	V
Gate voltage	V_{GS}	-5.0	V
Dissipated power (Tc= 25℃)	P_T	130	W
Storage temperature	T_{stg}	-65～+175	℃
Working temperature	T_{op}	-55～+85	℃

Typical circuit diagram



matters need attention

1) When charging, follow the sequence of first applying gate voltage and then drain voltage. When discharging, follow the sequence of first applying drain voltage and then gate voltage.
2) The heat dissipation should be paid attention in the process of using, because the high shell temperature will lead to the deterioration of the device performance and shorten the service life, and the lower the shell temperature, the longer the service life of the device.
3) This product is an electrostatic-sensitive device. Take precautions against static electricity during storage and use. Ensure all instruments and equipment are properly grounded.
4) Do not touch the device leads.
5) Irradiation characteristics: The device is radiation-insensitive.
6) If you have any questions, contact the supplier.

Electrostatic sensitivedevices:
pay attention to electrostatic protection

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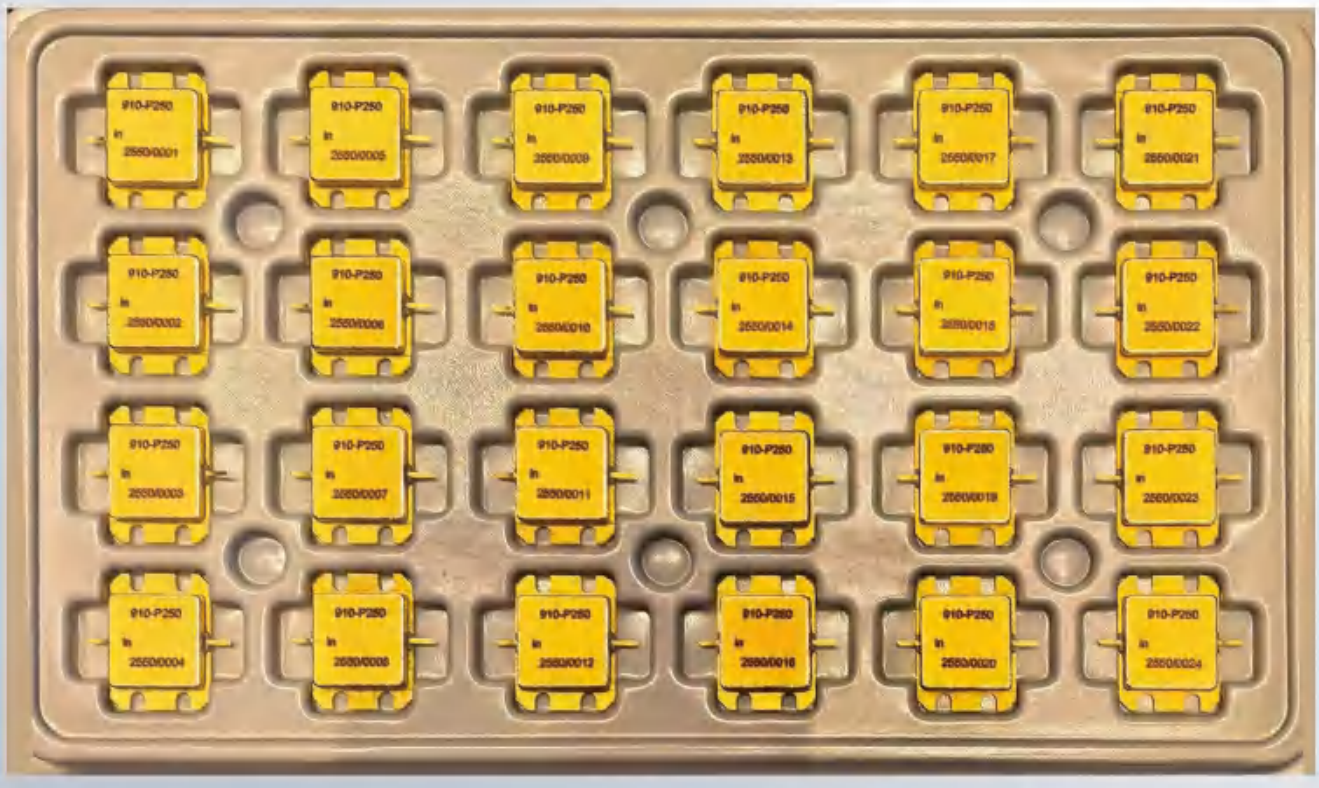
2.3 GaN internal matching power transistor

X-band



-XH910P250 （Alternative models HX8596P250W）

Performance characteristics

- Band: 9.0GHz～10.0GHz
- Power gain: 9dB
- Output power: 54dBm
- Power added efficiency: 40%
- Encapsulation type: QF1724-2E

Product Introduction

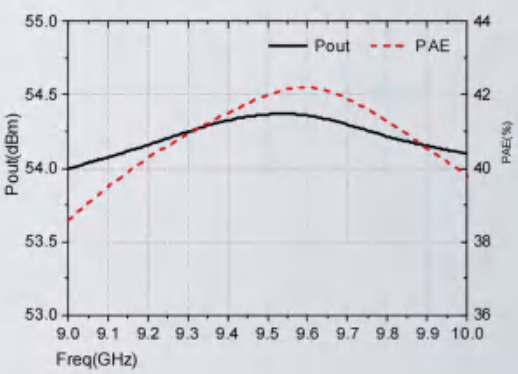
The 910P250 is an X-band GaN internally matched power tube with a operating frequency range covering 9.0GHz~10.0GHz, a typical output power of 54.0dBm, and a power gain of 9.0dB, providing optimal power and gain performance in a 50 ohm system.

Electrical parameters (TA = 25℃)

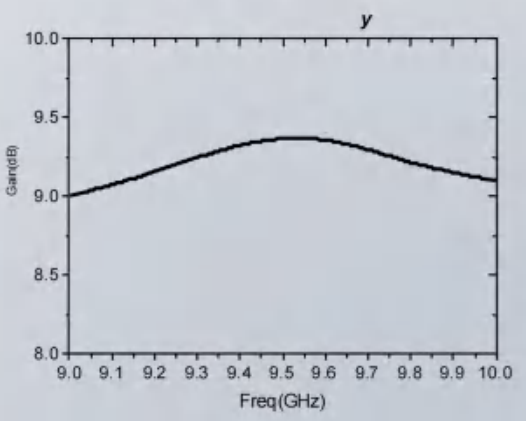
metric	symbol	Test condition	Extreme			Unit
			Least value	Representative value	Crest value	
Pinch-off voltage	V_p	V_{DS}=10.0V，I_{DS}≤50mA	-4.0	-	-1.5	V
Gate cutoff current	I_{GSS}	V_{DS}=0V，V_{GS}=-10V	-	-	4.0	mA
Gate drain cutoff current	I_{GD}	V_{GD}=120V	-	-	60.0	mA
Direct current thermal resistance	$R_{th(j-c)}$	T_C=70℃，V_{DS}=28V，I_{DS}=2.5A	-	-	0.85	℃/W
Output power	$P_{o(sat)}$	f=9.0～10.0GHz VDS= 40 B,VGS= —(1,5–3,0) B, один из фик сированных значений, Pin = 45 мВ м, длительность импульса: 550 мк с, коэффициент заполнения: 20%	54.0	-	-	dBm
Power gain	G_p		9.0	-	-	dB
Power added efficiency	PAE		38.0	40.0	-	%
Gain flatness	ΔG_p		-	-	±0.5	dB
Jamming suppression system	R_{fs}	Z_S=Z_L=50Ω	-	-	-60.0	dBc

Typical curve (TA = +25℃)

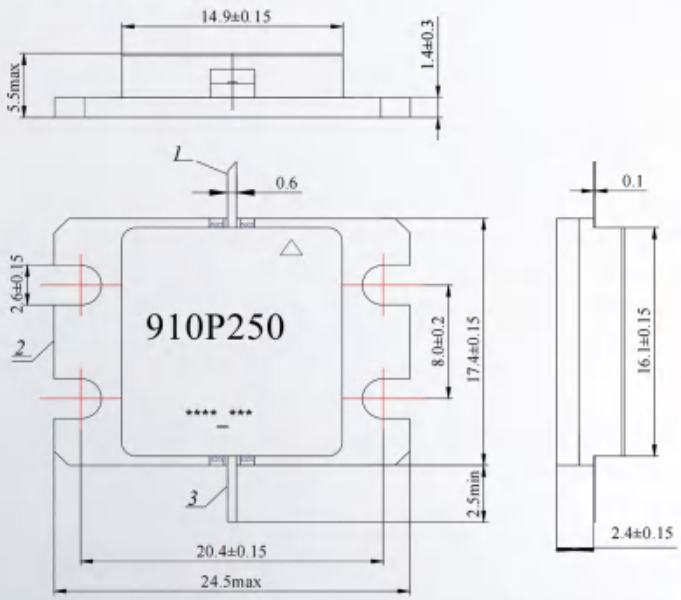
Power / Efficiency vs. Frequency



power gain vs. frequency



Encapsulation housing size (QF1724-2E)

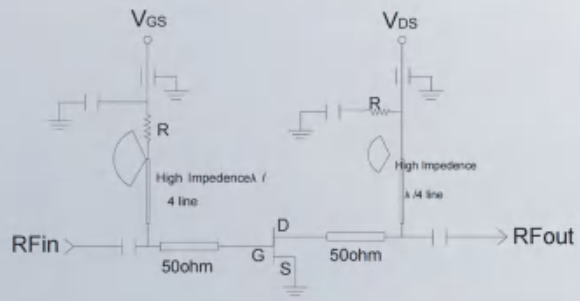


Note: The arrangement of the terminals is as follows: 1—gate, 2—source, 3—drain. The unit in the figure is millimeters.

Use the limit parameter (TA = +25℃)

metric	symbol	Extreme	Unit
Drain-source voltage	V_{DS}	50	V
Gate voltage	V_{GS}	-5.0	V
Dissipated power (Tc= 25℃)	P_T	200	W
Storage temperature	T_{stg}	-65～+175	℃
Working temperature	T_{op}	-55～+85	℃

Typical Circuit Diagram



Matters Need Attention

1) When charging, follow the sequence of first applying gate voltage and then drain voltage. When discharging, follow the sequence of first applying drain voltage and then gate voltage.
2) The heat dissipation should be paid attention in the process of using, because the high shell temperature will lead to the deterioration of the device performance and shorten the service life, and the lower the shell temperature, the longer the service life of the device.
3) This product is an electrostatic-sensitive device. Take precautions against static electricity during storage and use. Ensure all instruments and equipment are properly grounded.
4) Do not touch the device leads.
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6) If you have any questions, contact the supplier.

Electrostatic Sensitive Device
Please Pay Attention to
Electrostatic Protection

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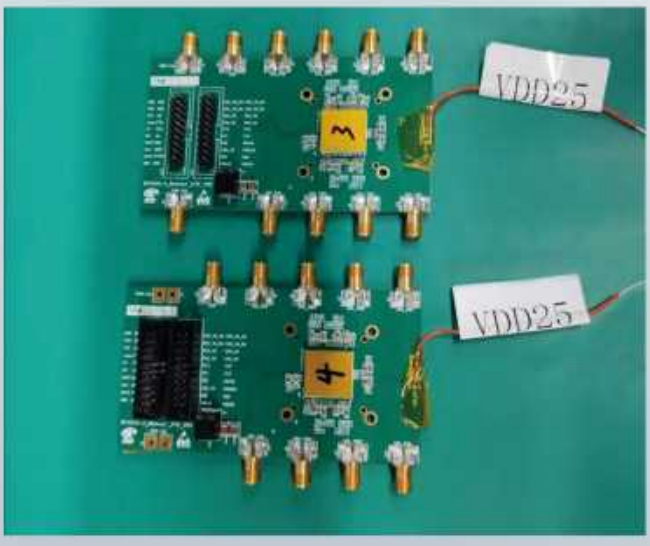
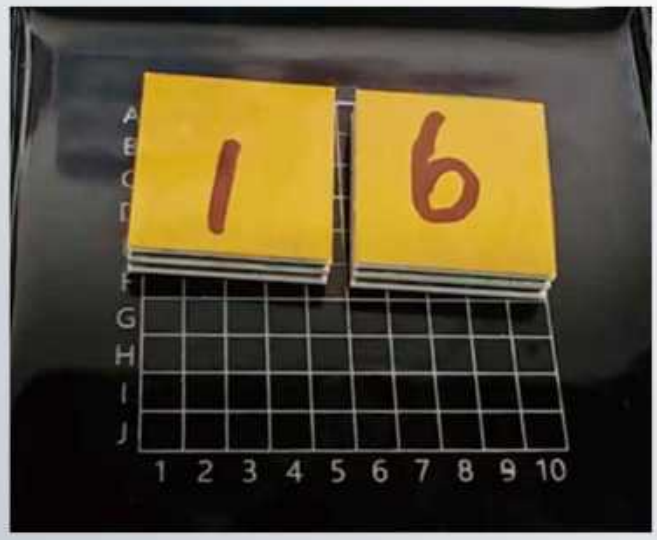
2.4 X-band 10W four-channel T/R module

SK8407-D





1. Product Typical Characteristics

Working frequency:8~12GHz

Receive path:

Receive linear gain: 30dB
Received noise figure: 1.7dB
Receive input P-1: -30dBm
Power handling: 40dBm
6 Displacement phase, step 5.625°,
RMS: 3° 6 bit attenuation, step 0.5 dB,
RMS: 0.6dB transmit path:

Maximum output power:

40.5dBm@Pin=0dBm. Additional
efficiency of transmitter power: 35% (100μs, DC: 10%).
6 Displacement phase, step 5.625°,
RMS: 3° Power:

Transmitter circuit power consumption:

28V：1.2A;
2.5V：200mA;
5V：50mA;

Input circuit power consumption:

2.5V：230mA;
5V：70mA;

Encapsulation size:

14.50mm × 15.50mm × 3.85mm

2. Feature Overview

The SK8407-D is an X-band four-channel T/R module with a frequency range of 8-12GHz. It features low-noise reception amplification, transmit power amplification, bidirectional amplification, and beamforming, with a 10W transmit output. The module integrates six-phase shift, six-stage attenuation, serial-to-parallel conversion, and power modulation functions.

Продукт оснащен герметичным металлокерамическим уплотнением; выводы выполнены по технологии BGA (Ball Grid Array) и подходят для монтажа методом ресоулинга.

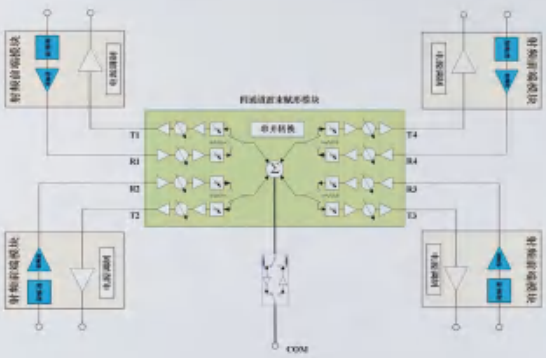


Figure 2.1 Four-Channel Functional Block Diagram

3. Electrical Performance Parameters

3.1 Radio Frequency Characteristics

Unless otherwise specified, electrical characteristics are measured under the following conditions: VDD28=28V, VDD5=5V, VEE5=-5V, VDD25=2.5V, DVDD25=2.5V, and TA=25℃.

Parameter	Symbol	Least value	Representative value	Crest value	Unit	Remarks
Frequency range	F	8		12	GHz	
Going	PW=100us, DC=10%, Pin=0 dBm, Condition 1					
Working temperature	TA	-55	25	85	℃	
receiving path						
Small-signal gain	G_{ain}-R	28	-	-	dB	Single channel test value, TA= 25℃,0 state
		TBD	-	-	dB	Single-channel test value, TA= -40℃, 0 state
		TBD	-	-	dB	Single-channel test value, TA= 85℃, 0 state
Gain flatness	$\triangle G_{ain}$	-2	-	2	dB	Single channel test value TA=25℃
Noise factor	NF-R	-	-	2.1	dB	Single-channel test value TA=25℃
Enter P-1	IP1dB-R	-33	-	-	dBm	Single channel test value TA=25℃
Power rating	Pin max-R	40	-	-	dBm	Continuous wave, 10 minutes
Phase shift accuracy RMS	PSR rms-R	-	-	4	°	All states
Phase shift addition amplitude modulation	ΔA PSR-R	-1.5	-	+1.5	dB	
Attenuation accuracy RMS	ATT rms-R	-	-	1	dB	All states
Attenuated additive phase shift	ΔP ATT-R	-10	-	10	°	
Channel phase coherence	PH_diff-R	-25	-	+25	°	The same batch, state 0
Channel gain consistency	G_{ain}_diff-R	-1.5	-	+1.5	dB	The same batch, state 0
Input return loss	RL_{-Rin}	10	-	-	dB	0 form
Output return loss	RL_{-Rout}	10	-	-	dB	0 form
Transmission path (Condition 1)						
Saturated output power	OPsat-T	40	-	-	dBm	TA= 25°C, Condition 1
		40	-	-	dBm	TA=-55°C, condition 1
		40	-	-	dBm	TA=+85°C, condition 1
Flatness of saturated output power	ΔPsat	-1	-	1	dB	Condition 1,0 state
Power gain	GP-T	40	-	-	dB	Condition 1,0 state
Emission additional efficiency	PAE	32	-	-	/	Condition 1,0 state
Phase shift accuracy RMS	PSR rms-T	-	-	4	°	TA=25℃
Band clutter of transmitting signal	spur-T	60	-	-	dBc	Condition 1,0 state
Channel amplitude consistency	ΔA-T	-1	-	+1	dB	TA=25℃
Channel phase coherence	PH_diff-T	-25	-	+25	°	TA=25℃
Input return loss	RL_{-Tin}	10	-	-	dB	TA=25℃
Rise time/fall time	t_r/t_f	-	-	100	ns	

Parameter	Symbol	Least value	Representative value	Crest value	Unit	Remarks
Send-receive switch time	t_{TR}	-	-	150	ns	

3.2 Direct-Current Characteristic

Unless otherwise specified, electrical characteristics are measured at TA=+25℃.

Parameter	Symbol	Least value	Representative value	Crest value	Unit	Remarks
Saturation output current of VDD28 power amplifier	I_{VDD28}	-	1.2	-	A	+28V single-channel voltage
VDD25 power supply for the emitter	$I_{VDD25-T}$	-	210	-	mA	+2.5V single-channel voltage
Power Supply VEE5	I_{VEE5}	-	25	-	mA	-5V single-channel voltage
VDD5 power supply for the emitter	I_{VDD5_T}	-	50	-	mA	+5V single-channel voltage
Receive circuit power supply VDD5	I_{VDD5_R}	-	70	-	mA	+5V single-channel voltage
Receive circuit power supply VDD25	$I_{VDD2P5-R}$	-	180	-	mA	+2.5V single-channel voltage
Digital power supply DVDD25	$I_{DVDD2P5}$	-	20	-	mA	+2.5V voltage
Logic low	V_{IL}	0	-	0.8	V	Logic 0
Logic high	V_{IH}	2.4	-	2.8	V	Logic 1

4. Absolute Rating

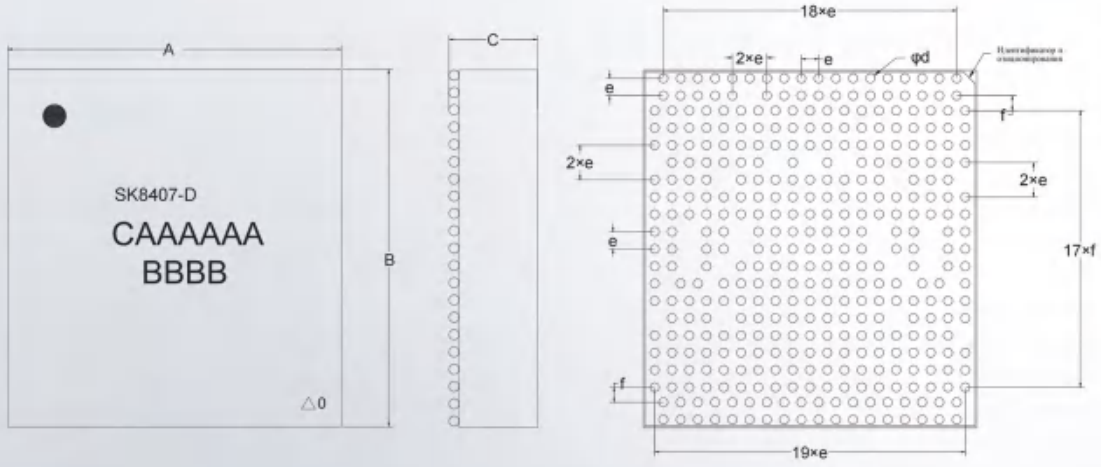
All voltages are referenced to GND.

Parameter	Numeric value
The power supply for the emitter stage is +28V, with VDD28.	≤+32V
Power supply +2.5V, VDD25	≤+3V
Power supply: -5V, VEE5	≥-6V
The power supply for the emitter stage is +5V, with VDD5	≤+5V
Receive circuit power supply +5V, VDD5	≤+5V
Digital power supply +2.5V, DVDD25	≤+3V
HBM Electrostatic Level	Grade 1A
Fitting temperature	≤220℃
Storage temperature range	-65℃ ~+125℃
Operating temperature range	-55℃ ~+85℃

5. Outline Dimension

The product features BGA packaging with an aluminum oxide (Al2O3) shell, measuring 14.5mm in external dimensions.

$^{+0.1}_{-0.1}$×15.5mm $^{+0.1}_{-0.1}$×3.85mm $^{+0.15}_{-0.15}$ (including ball), the product shape is shown in the figure.



top view lateral view bottom view

Figure 5.1 Three Views

Table 5.1 Dimensions and Tolerances

Dimension Symbol	Value (unit: mm)		
	Minimum	Nominal	Maximum
A	14.35	14.5	14.65
B	15.35	15.5	15.65
C	3.7	3.85	4.0
φd	-	0.4	-
e	-	0.75	-
f	-	0.65	-

explain：

1. For dimensions without specified tolerances, the maximum deviation shall comply with the m-grade standard in GB/T 1804.
2. Shell material: alumina ceramic;
3. The ball diameter is 450um, Sn10Pb90 (non collapse ball) and Sn63Pb37 (183℃ solder) are mixed;
4. The soldering temperature is 183℃ (Sn63Pb37).

6. Pin Definition

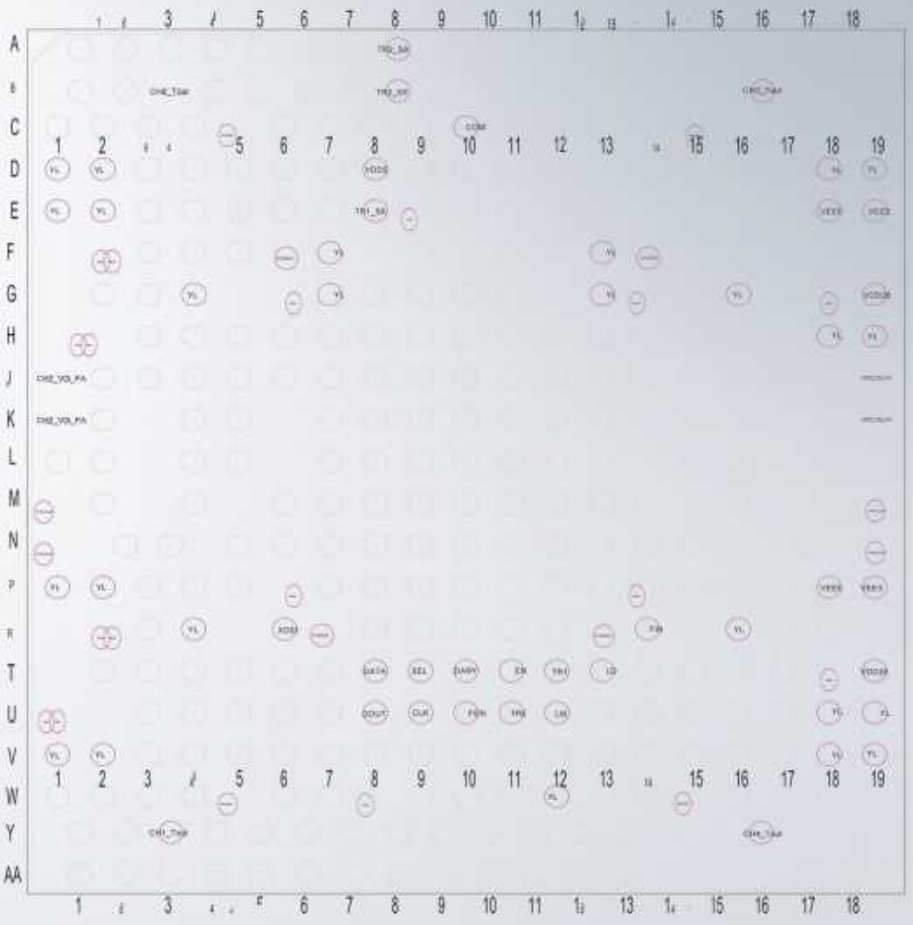


Figure 6.1 Top Perspective View

Figure 6.1 Top Perspective View

Item	Symbol	Name	Description
C10	COM	Public port	Transmit input/receive output port
W5	CH1_Rin	Radio frequency input port	Receive input port
C5	CH2_Rin	Radio frequency input port	Receive input port
C15	CH3_Rin	Radio frequency input port	Receive input port
W15	CH4_Rin	Radio frequency input port	Receive input port
Y3	CH1_Tout	Radio frequency output port	Transmit port
B3	CH2_Tout	Radio frequency output port	Transmit port
B16	CH3_Tout	Radio frequency output port	Transmit port
Y16	CH4_Tout	Radio frequency output port	Transmit port

F1 F2 G18 G19 R1 R2 T18 T19	VDD28	Power input port	+28V, with an external 10μF filter capacitor and its corresponding energy storage capacitor
E18 E19 H1 H2 P18 P19 U1 U2 E9	VEE5	Power input port	-5V, external filter capacitors 1uF and 0.1uF
D8	VDD5	Analog power input port	+5V, external 1μF/0.1μF filter capacitors
G6 G14 P6 P14 W8	VDD25	Power input port	RF power supply: 2.5V, with external filter capacitors of 0.1uF and 1uF
F6 F14 R7 R13	DVDD25	Power input port	Digital power supply: 2.5V, with external filter capacitors of 0.1uF and 1uF
M1 N1	CH1_VG_PA	Gate voltage output filter port	Filter port for amplifier gate voltage output, with an external 10μF filter capacitor
J1 K1	CH2_VG_PA	Gate voltage output filter port	Filter port for amplifier gate voltage output, with an external 10μF filter capacitor
J19 K19	CH3_VG_PA	Gate voltage output filter port	Filter port for amplifier gate voltage output, with an external 10μF filter capacitor
M19 N19	CH4_VG_PA	Gate voltage output filter port	Filter port for the amplifier's gate voltage output, with an external 10μF filter capacitor
T12	TR1	Logic signal input port	Receiving power modulation
U11	TR2	Logic signal input port	Emission power modulation
E8	TR1-SX	Logic signal input port	Connect to TR1 pin
A8 B8	TR2-SX	Logic signal input port	Connect to TR2 pin
U9	CLK	Clock input port	Clock signal: data input on the falling edge, data output on the rising edge
T8	DATA	Serial data input port	Serial data input
U8	DOUT	Serial data output port	Serial data output during the rising edge of CLK
T13	LD	Self-test control input port	When the LD is at high level, the chip outputs self-test data.
T9	SEL	Serial data enable input port	The serial input data is valid when SEL and LD are low; the secondary cache loading signal is valid on the rising edge; the secondary cache write address refresh signal is valid on the rising edge.
T10	DARY	Data loading input port	Level 3 cache loading signal, valid on the rising edge
R14	FIN	Address input port	Func module data input port
U10	FEN	Serial data input port	When the low level is active, the FIN serial input data becomes valid. Upon the rising edge, the data in Func1 is updated to Func2.
T11	EN	Enable control input port	When the high level is active, turn on the load switch and turn off the amplifier power.
U12	LM	Data loading mode input port	LM is high level for sequential output mode; LM is low level for specified address output mode

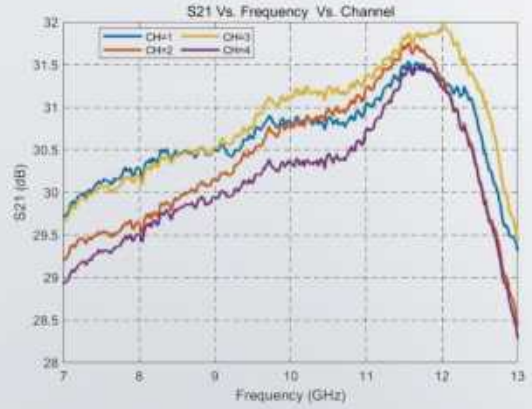
R6	XD01	Top/Bottom Electrical Control Output Port	External power control (up/down), can be left suspended if not in use
D1 D2 E1 E2 D18 D19 F7 F13 G4 G7 G13 G16 H18 H19 P1 P2 R4 R16 U18 U19 V1 V2 V18 V 19 W12	YL	Reserved port	Reserve ports, recommended to leave them idle
	GND	Ground port	Connect to RF ground

7. Test Curve-Receiving Channel

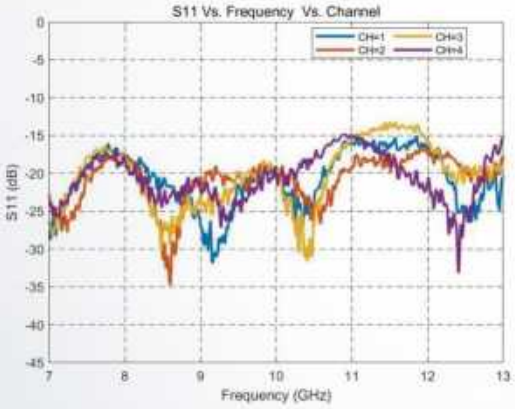
CLK=330kHz, VDD28=28V, VEE5=-5V, VDD25=2.5V, DVDD25=2.5V, VDD5=5V。

7.1 Small-Signal

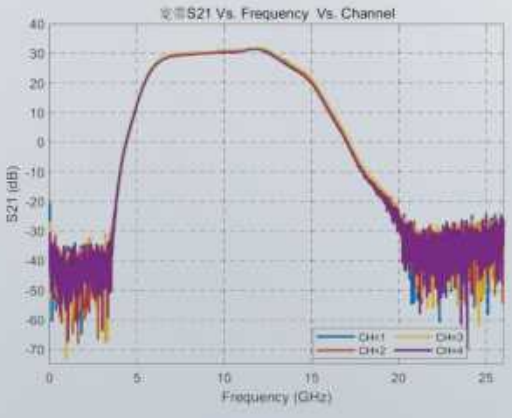
Small Signal Gain vs Frequency vs Channel



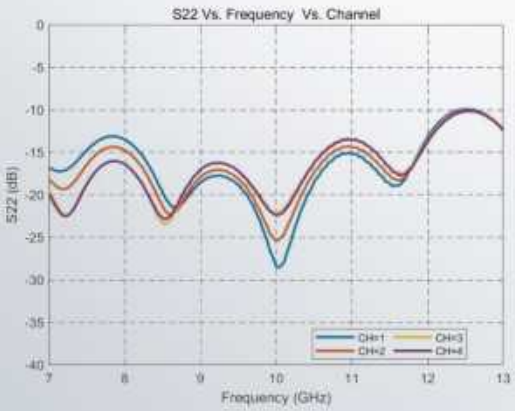
Input ECL vs Frequency vs Channel



Broadband Small Signal Gain vs Frequency vs Channel



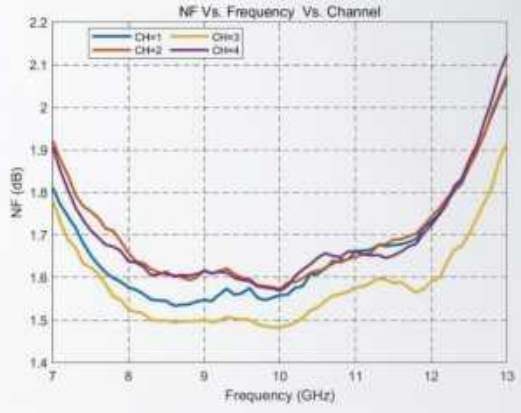
Output ECL vs Frequency vs Channel



Test curve-receiving channel

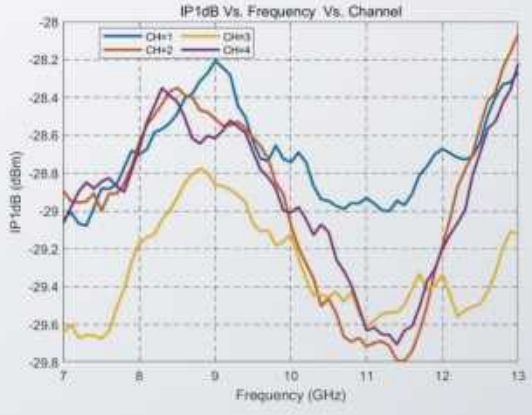
7.2 Noise Characteristic

NF vs Frequency vs Channel



7.3 Large-Signal

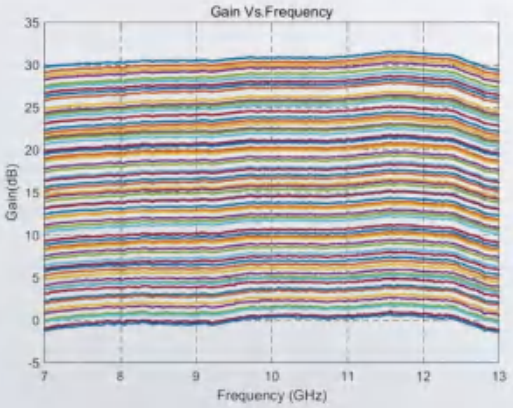
IP1dB vs Frequency vs Channel



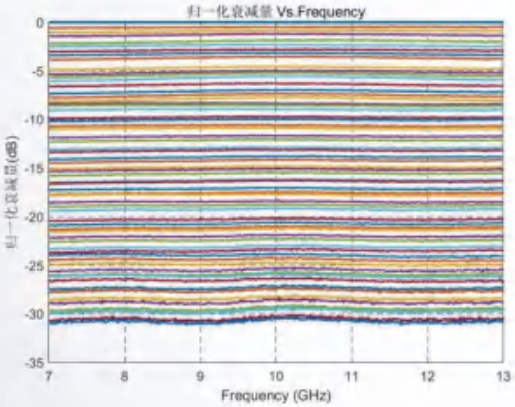
Test curve-receiving channel

7.4 Fading Characteristic

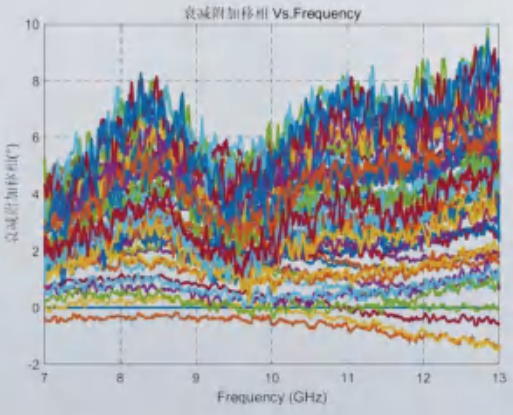
Small Signal Gain vs Frequency under Different Attenuations



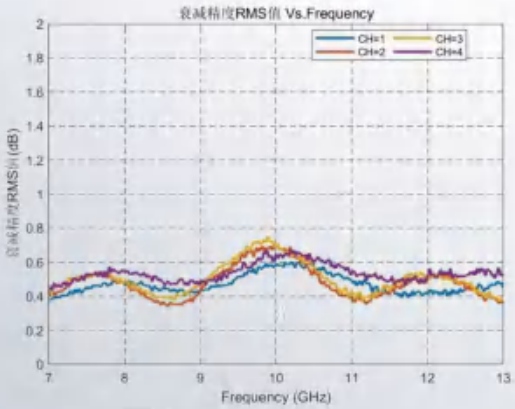
Normalized Attenuation vs. Frequency



Attenuation with additional phase shift vs. frequency



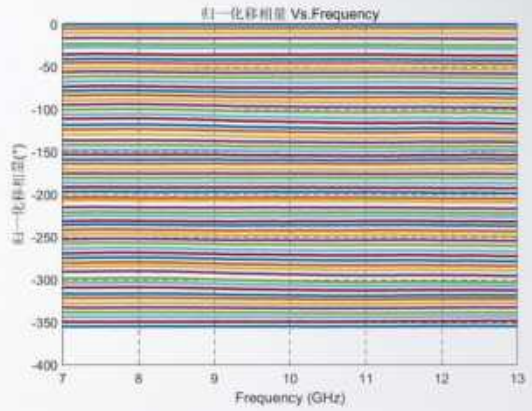
RMS value vs frequency vs channel



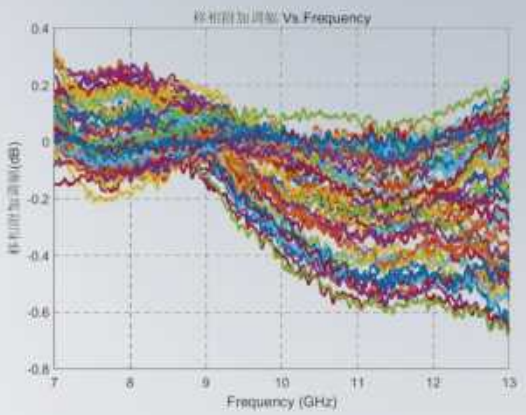
Test curve-receiving channel

7.5 Phase Shift Characteristic

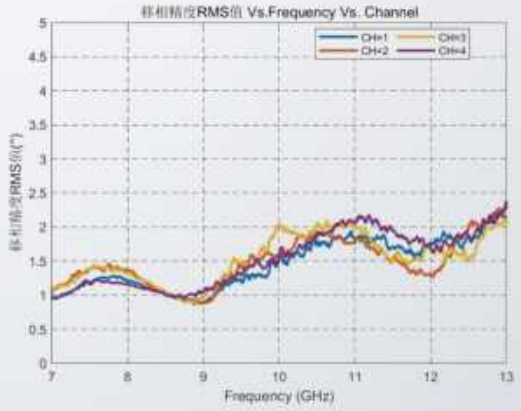
Normalized Phase Shift vs Frequency



phase shift AM vs frequency



RMS phase shift accuracy vs frequency vs channel

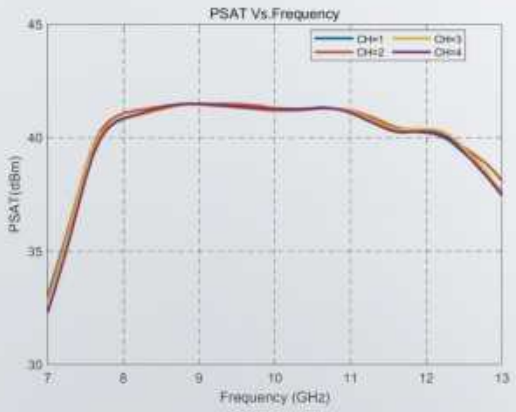


8. Test Curve-Emission Channel

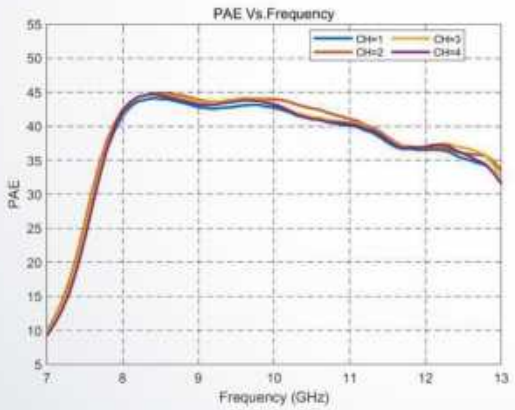
CLK=330kHz，VDD28=28V，VEE5=-5V，VDD5=5V，VDD25=2.5V，DVDD25=2.5V。
Pin=0dBm，PW=100us，DC=10%。

8.1 Power Characteristic

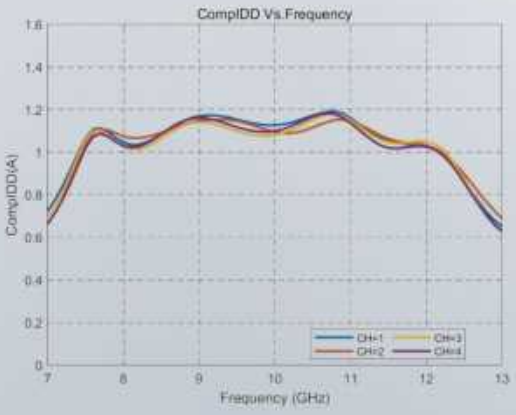
Output power vs. frequency vs. channel



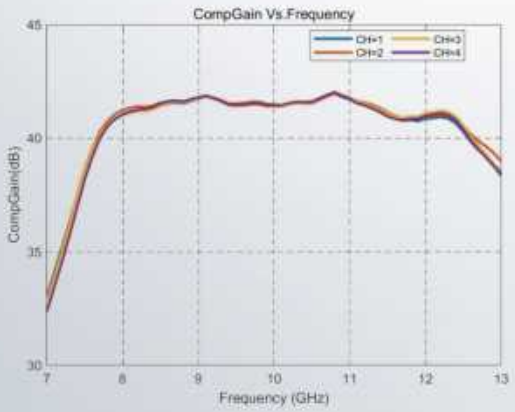
Power added efficiency vs frequency vs channel



Drain current vs frequency vs channel

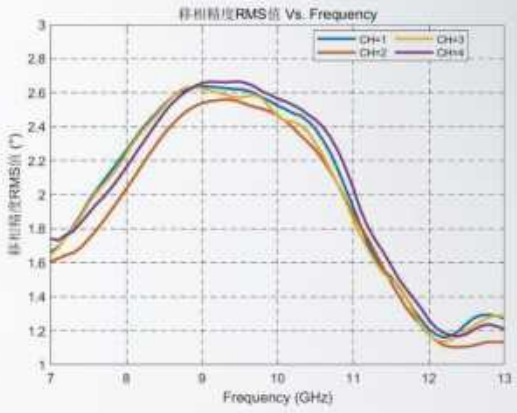


Power gain vs Frequency vs Channel



8.2 Phase Shift Characteristic

Phase Shift Accuracy vs Frequency vs Channel

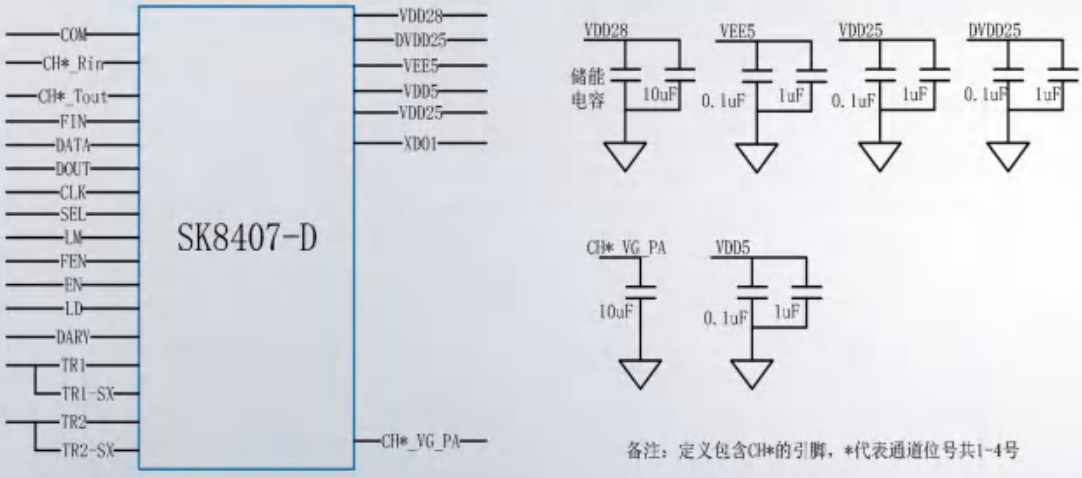


9. Application Message

9.1 Direction for Use

The solder (Sn63Pb37) was used at 183℃, and the reflow temperature should be ≤220℃.

9.2 Recommended Circuit



备注：定义包含CH*的引脚，*代表通道位号共1-4号

9.3 Operation Protection Conditions

ESD (electrostatic discharge) sensitive devices.

Electrical components and circuit boards may discharge without being noticed.Although this product has ESD protection circuit, components may be damaged when exposed to high-energy ESD. Therefore, appropriate ESD precautions should be taken to avoid performance deterioration or loss of functionality.

9.4 Operation Notes

Storage: It must be placed in a container with electrostatic protection, in a dry environment, and preferably in an environment with nitrogen if conditions permit.

Electrostatic protection: Strictly comply with ESD protection requirements to avoid electrostatic damage to devices.

Routine operation: Use a vacuum clamp or tweezers to pick up the product. Avoid touching the product surface with tools or fingers during operation.

Assembly operation: :Suitable for SMT assembly. Use solder at 183℃ for soldering. The recommended temperature should not exceed 220℃.

3. Laser Ranging Module Series

905nm

1.5-2km Semiconductor Laser Ranging Module

The semiconductor laser ranging module is a miniature laser ranging module developed based on a 905nm semiconductor laser. It features a small size, light weight, and long measurement range. Its application fields include handheld rangefinders, micro drones, and ranging scopes. It has a UART (TTL_3.3V) data transmission interface, providing upper-level software and communication protocol command sets, making it convenient for user secondary development.

LSP-LRD-1500/LSP-LRD-2000/LSP-LRD-1200-G

technical parameter

	LSP-LRD-1500	LSP-LRD-2000	LSP-LRD-1200-G
Parameter		numeric value	
Human eye safety level		Class 1	
Laser wave length		905nm±5nm	
Laser divergence angle		≤6mrad	
Range capability	3~1500m (Large target)	3~2000m (Large target)	0.5~1200m
Ranging accuracy	±0.5m(≤80m),±1m(<1000m), ±(0.2+0.0015*D)(>1000m)		±0.5m(≤80m),±1.0m(>80m)
Measuring frequency	1~10Hz (adaptive)		60~800Hz
Quasi-accuracy rate		≥98%	
False alarm rate		≤1%	
Data interface		UART (TTL_3.3V)	
Service voltage		DC 3.0V~5.0V	
Sleep power consumption (POWER_EN lowered)	≤1mW		-
Standby power consumption		≤0.8W	
Power consumption	≤1.5W	≤1.6W	≤1.8W
Weight		11g±0.5g	
Dimensions (LxWxH)		≤25mm×26mm×13mm	
Working temperature		-20℃ to +65℃ (customizable to -40℃)	
Storage temperature		-45℃~+70℃	
Lash		1000g,20ms	
Vibrate		5~50~5Hz, 1 octave/min,2.5g	

Note: Visibility ≥10 km, humidity ≤70%. Large targets: targets larger than the light spot size are supported for customization.

core advantage

in light weight≤11g

Size ≤ 25 MM × 26 MM× 13 MM

Low power consumption: ≤1.8W

Defense-grade temperature range: -40℃ to +65℃

Impact resistance: 1000g@20ms

The LSP-LRS-0310F-04 laser ranging module, developed by Bright Optoelectronics, utilizes a self-designed 1535nm sapphire laser and employs single-pulse Time of Flight (TOF) technology with a maximum range exceeding 3km. Comprising a laser source, transmitter optics, receiver optics, and control circuit board, it communicates with host computers via RS422 serial port (TTL interface customizable), providing testing software and communication protocols for userfriendly secondary development. Featuring compact size, lightweight design, stable performance, high-impact resistance, and Class 1 eye safety, this module is suitable for handheld, vehicle-mounted, and pod-based optoelectronic systems.

LSP-LRS-0310F-04

technical parameter

LSP-LRS-0310F-04		LSP-LRS-0310F-04	
Parameter	numeric value	Parameter	numeric value
Human eye safety level	Class 1	Data interface	RS422 serial port (TTL serial port available for customization)
Laser wave length	1535±5nm	Service voltage	DC 5V~28 V
Laser divergence angle	≤0.6mrad	Average power consumption	operation≤0.8W (1Hz operation)
Receiving aperture	Φ16mm	Peak power consumption	≤3W
Ranging accuracy	≤±1m	Standby power consumption	≤0.2W
Measuring frequency	1~10Hz	Dormant power consumption	≤2mW (when the POWER_EN pin is low)
Range resolution	≤30m	Outline dimension	≤50mm×22mm×31mm
Quasi-accuracy rate	≥98%	Weight	33g±1g
False alarm rate	≤1%	Working temperature	-40℃~+70℃
Minimum range	≤15m	Storage temperature	-55℃~+75℃
Range capability	≥5 KM (Large target: ≥3 M × 3 M) ≥3,2 KM (vehicle: 2.3m×2.3m) ≥2 KM (person: 1.7m×0.5m) ≥1 KM (UAV: 0.2m×0.3m)	Impact vibration	75g@6ms (customizable to 1000g/1ms)
			Vibration Environment of Combination Wheeled Vehicles
		Multi target detection capability	By default, it supports single target, up to 3 targets for single/range/continuous/range measurement, distance selection, first/last target indication, selfcheck function, and external power control

Note: Visibility ≥12 km, humidity ≤80%, and reflectivity ≥0.3under clear visibility conditions. Customization is supported.

core advantage

Lightweight: 33g±1g

Size ≤50mm×22mm×31mm

High precision ≤±1m

Low power consumption: ≤0.8W

Defense-grade temperature range: -40°C to +70°C

1000g@1ms

1535nm

5km-15km Erbium Glass Laser Range Measurement Module

LSP-LRS-0516F

LSP-LRS-0621F

LSP-LRS-0725F

LSP-LRS-0825F

LSP-LRS-1040F

LSP-LRS-1247F

LSP-LRS-1552F

Parameter	numeric value						
Human eye safety level	Class 1						
Laser wave length	1535±5nm						
Laser divergence angle	≤0.3mrad						
Measuring frequency	Adjustable from 1 to 10Hz						
Receiving aperture	Φ16mm	Φ21mm	Φ25mm	Φ25mm	Φ40mm	Φ47mm	Φ52mm
Large target (building) ranging capability	≥6000m	≥7000m	≥8000m	≥10000m	≥12000m	≥15000m	≥20000m
Range capability vehicle (2.3m×2.3m)	≥5000m	≥6000m	≥7000m	≥8000m	≥10000m	≥12000m	≥15000m
Range finder (1.7m×0.5m)	≥3000m	≥3000m	≥5000m	≥5500m	≥6500m	≥7000m	≥7500m
Minimum rang	≤15m	≤20m	≤30m		≤50m	≤70m	
Ranging accuracy	≤±1m					≤±1.5m	
Quasi-accuracy rate	≥98%						
False alarm rate	≤1%						
Range resolution	≤30m						
Supply voltage	DC 5V–28V						
Product weight	≤40g	≤57g	≤72g	≤72g	≤130g	≤180g	≤191g
Average power consumption (1Hz operation)	≤1W@5V			≤1.3W@5V	≤1.5W@5V	≤2W@5V	
Peak power consumption	≤3W@5V		≤4W@5V		≤4.5W@5V	≤5W@5V	
Standby power consumption	≤0.2W						
Major function	a) Single and continuous ranging;b) Distance gating and target indication;c) Self-check function.						
Communication interface	TTL	RS422 (TTL configurable)		CAN RS422 (TTL configurable)			
Size	≤50mm×23mm ×33.5mm	≤65mm×40mm ×28mm	≤65mm×46mm ×32mm	≤65mm×46mm ×32mm	≤83mm×61mm ×48mm	≤100mm×60mm ×70mm	≤104mm×61mm ×74mm
Working temperature	-40°C~+60°C						
Storage temperature	-55°C~+70°C						
Vibrate	Vibration Environment of Propeller Aircraf						
Lash	>75g@6ms						

Note: Visibility ≥20km under clear visibility conditions, humidity ≤80%, and reflectivity ≥0.3.Customization support

Usage Notes

1. The laser emitted by this ranging module is 1535nm, which is safe for human eyes. Although it is a safe wavelength for human eyes, it is recommended not to look directly at the laser.
2. When adjusting the parallelism of the three optical axes, the receiving lens must be blocked, otherwise the detector will be permanently damaged due to the strong echo.
3. This non-airtight ranging module requires a relative humidity below 80% and a clean environment to prevent laser damage.
4. The range of the range finder module is related to the atmospheric visibility and the nature of the target. The range will be reduced in the case of fog, rain and wind and sand. The green leaf cluster, the white wall, the exposed limestone and other targets have good reflectivity, which can increase the range.
5. It is forbidden to fire laser to the glass or white wall within 5 meters, because the echo is too strong and the APD detector will be damaged.
6. It is forbidden to plug or unplug the cable while the cable is in power.
7. Ensure the power polarity is connected correctly, otherwise the device will be permanently damaged.

1064nm

10km-35km long range laser ranging module

LSP-LRF-1540 (Drone Measurement Module)

LSP-LRF-21120

Parameter	numeric value		remarks
Laser wave length	1064nm±2nm		
Laser divergence angle	0.5±0.2mrad		
Coverage A	300m~23km ①	300m~32km ①	Big Goal
Coverage B	300m~15km ②	300m~21km ②	Target size: 2.3mx2.3m
Coverage C	300m~7.5km ③	300m~12km ③	Target size: 0.1㎡
Coverage D	≥5.5km	≥8km	Supports custom range measurement capability (for drone modules)
Ranging accuracy	≤±5m		
Service frequency	Adjustable from 1 to 10Hz		Supports custom frequency (test drone module)
Service voltage	DC28V±4V		
temperature	-40 °C~55 °C (working), -45 °C~60 °C ((storage)	-40℃~60℃ (working), -50℃~70℃ (storage)	
Power dissipation	≤200W (average), ≤300W (peak)		
Communication interface	RS422		Customization support
Size	≤207.3mmx202mmx53mm	515.5mmx340mmx235mm	
Weight	≤4kg	37kg	
Working life	≥1 million times		

Remarks： ① Visibility ≥25km, large target, target reflectivity 0.2, divergence Angle 0.6mrad ② Visibility is ≥25km,2.3mx2.3m vehicle target, reflectivity of target is 0.2, divergence Angle is 0.6mrad ③ Visibility ≥ 25km,0.1m2 target, target reflectivity 0.2, divergence Angle 0.6mrad

1570nm

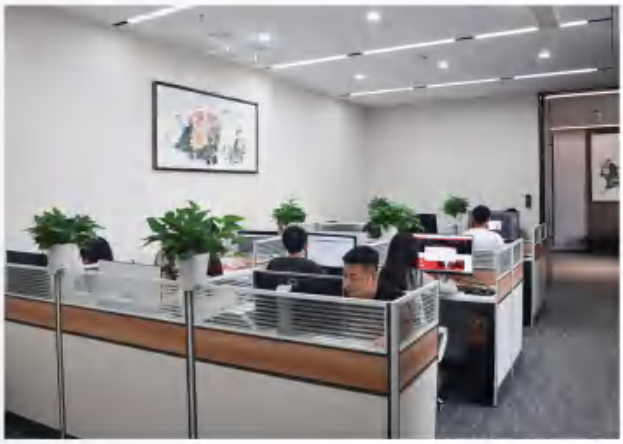
20km-40km long range laser ranging module

LSP-LRE-1265

LSP-LRE-18138

parameter	numeric value		remarks
laser wave length	1570nm±10nm		
laser divergence angle	1.2±0.2mrad		
coverage A	300m~24km ①	300m~34km ①	Target size: 2.3mx2.3m
coverage B	300m~12km ②	300m~18km ②	
coverage C	300m~6km ③	300m~10km ③	Target size: 0.1㎡
coverage D	≥4.5km	≥7km	Supports custom range measurement capability (for drone modules)
ranging accuracy	≤±5m		
service frequency	Adjustable from 1 to 10 Hz		Supports custom frequency (test drone module)
service voltage	DC18V~32V	DC28V±4V	
temperature	-40℃~55℃ (working), -50℃~65℃ (storage)		
power dissipation	≤50W (average), ≤160W (peak)	≤200W (average), ≤300W (peak)	
communication interface	RS422		Customization support
size	214.3mm×116mm×81.15mm	405mmx234mmx163mm≤	
weight	2275±30g	12kg	
working life	≥1 million times		

remarks： ① Visibility ≥25km, large target, target reflectivity 0.2, divergence angle 1.2mrad ② Visibility is ≥25km,2.3mx2.3m vehicle target, reflectivity of target is 0.2, divergence Angle is 1.2mrad ③ Visibility ≥ 25km,0.1m2 target, target reflectivity 0.2, divergence Angle 1.2mrad



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