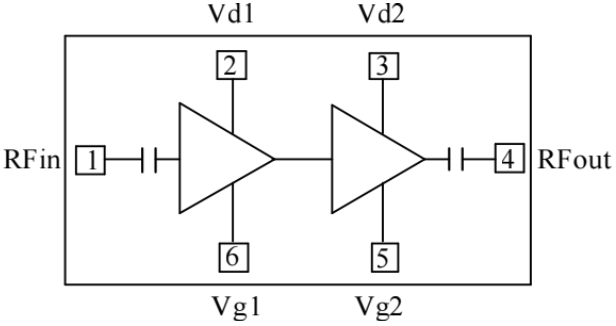
HX116691C-218P2 GaN MMIC **power amplifier chip,**2GHz～18GHz

Performance Features

- Frequency range: 2GHz to 18GHz
- Power gain: 17dB
- Maximum output power: 34dBm
- Additional efficiency: 20%
- +28V@200mA (static)
- Chip size: 2.90mm×2.50mm×0.08mm

functional block diagram



Product Introduction

The HX116691C-218P2 chip is a high-power amplifier implemented using GaN HEMT transistors, fabricated through the 0.15 μm GaN power MMIC process. It operates within a frequency range of 2GHz to 18GHz, featuring a power gain exceeding 17dB, a typical saturated output power of 2.5W, and a power add-on efficiency above 18%. The chip supports both pulse and continuous wave modes and employs backside via grounding with dual power supply operation, maintaining typical operating voltages of Vd=+28V and Vg=-1.8V. It is primarily designed for applications in microwave transceiver modules and high-power solid-state transmitters.

DC current parameters (TA = +25°C)

Metric	Symbol	Least value	Representative value	Crest value	Unit
Gate operating voltage	Vg		-1.8	-5	V
Drain operating voltage	Vd	16	28	28	V
Static drain current	Id		200		mA
Dynamic drain current	Idd		0.5	0.55	A
Dynamic gate current	Igg		0.01	0.7	mA

Microwave electrical parameters (TA = +25°C, Vd = +20V)

Metric	Symbol	Least value	Representative value	Crest value	Unit
Frequency range	f	2～18			GHz
Saturated output power	Psat	34	34.5		dBm
Power gain	Gp		17		dB
Power gain flatness	△Gp			±1	dB
Power added efficiency	PAE	18	20		%
Linear gain	Gain	21	23	25	dB
Linear gain flatness	△Gain			±2	dB
Input standing wave	VSWR(in)		1.5	3.5	-

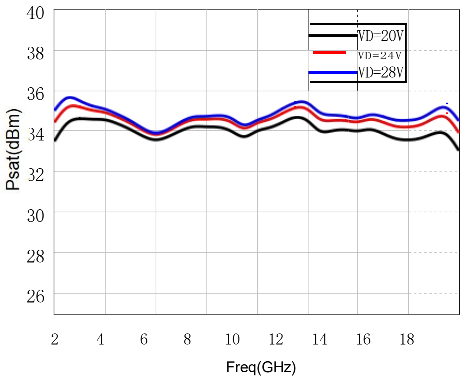
Note: 1) All chips have undergone in-chip 100% DC testing and 100% RF testing.

Limit usage parameters

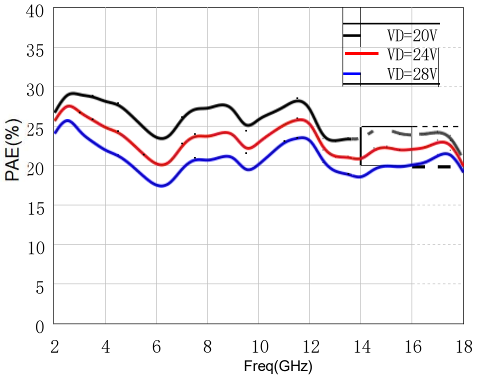
Parameter	Symbol	Limit value
Maximum drain-source forward bias voltage	Vd	+28V
Minimum gate-source negative bias	Vg	-5V
Maximum input power	Pin	+22dBm
End-use temperature	T_{op}	-55℃~+125℃
Storage temperature	T_{STG}	-65℃~+150℃

Test curve (Vd=+28V, Vg=-1.8V)

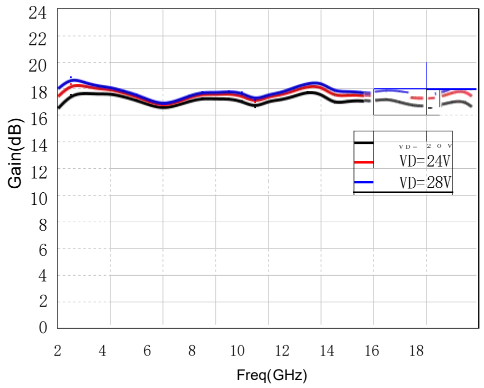
Maximum output power vs. frequency (Pin = 17dBm)



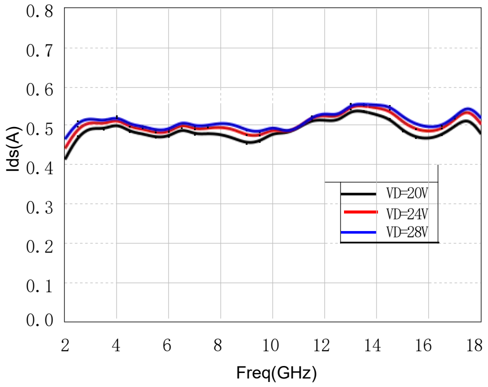
Additional efficiency vs. frequency (Pin = 17 dBm)



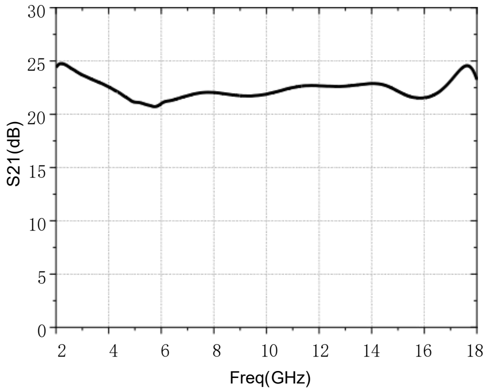
Power gain vs. frequency (Pin = 17dBm)



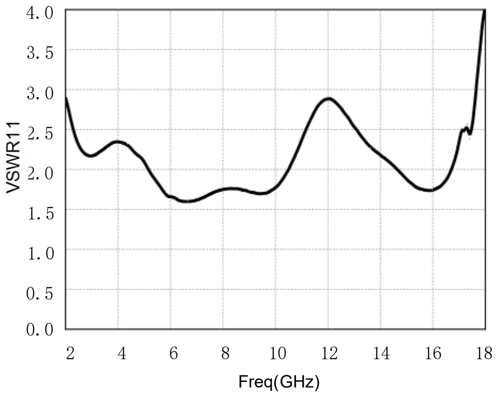
Drain dynamic current vs. frequency (Pin = 17dBm)



Small signal gain vs. frequency (Pin=-10 dBm)

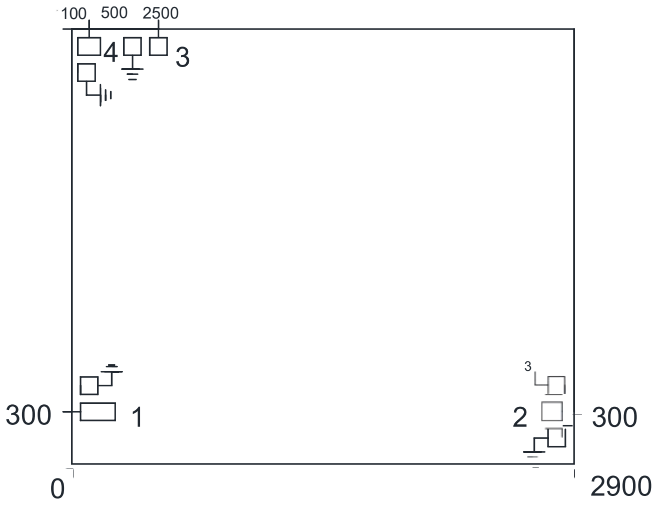


Enter standing wave vs. frequency (Pin=-10dBm)



outline dimension

External dimensions of HX116691C-218P2



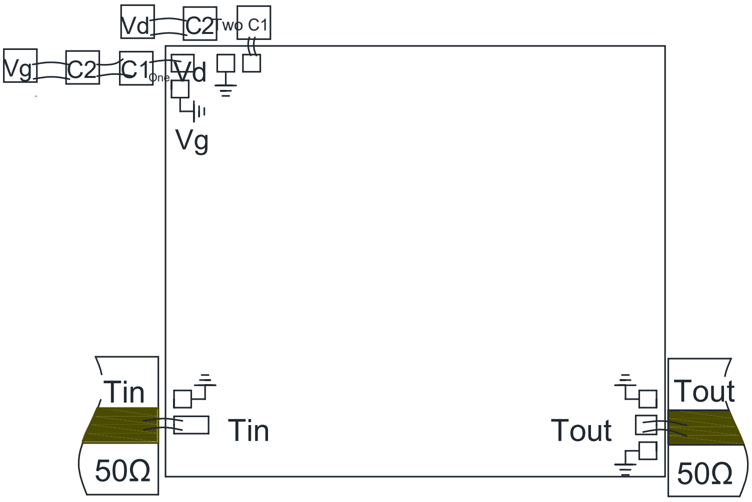
Note: All units in the figure are micrometers (μm).

The chip thickness is 80μm;
The dimensional tolerance is ±25 μm.

Definition of bonding pressure point

Pressure point number	Function symbol	Functional description	Size
1	Tin	At the RF signal input terminal, an external 50-ohm system is connected, eliminating the need for a DC-blocking capacitor.	$200\times100\mu m^2$
2	Tout	The amplifier's RF output is connected to an external 50-ohm system without requiring a DC-blocking capacitor.	$120\times110\mu m^2$
3	Vd	An external power filter capacitor of 100pF or 1000pF must be connected to the amplifier's drain voltage feedthrough terminal.	$100\times100\mu m^2$
4	Vg	An external power filter capacitor of 100pF or 1000pF must be connected to the amplifier gate voltage feed terminal.	$130\times100\mu m^2$

Recommended Assembly Drawing



Note: The capacitance values for peripheral capacitor C1 and C2 are 100pF and 1000pF, respectively.

Matters Need Attention

1） For use in environmental purification systems;

2） GaN materials are highly brittle, and the chip surface is prone to damage (avoid direct contact). Handle with extreme caution during use.

3） Use two bonding wires (25μm diameter gold wires) for input and output connections. The bonding wires should be as short as possible, not exceeding 300μm in length.

4） The input and output are connected with a DC-blocking capacitor.

5） Use 80/20 gold-tin solder for sintering. The sintering temperature should not exceed 300°C, and the sintering time should be as short as possible, not exceeding 30 seconds.

6） This product belongs to electrostatic-sensitive devices. Prevent static electricity during storage and use.

7） Store in a dry, nitrogen atmosphere;

8） Do not attempt to clean the chip surface using dry or wet chemical methods;

9） Please contact the supplier if you have any questions.

This product is sensitive to static electricity. Please take anti-static precautions during use.