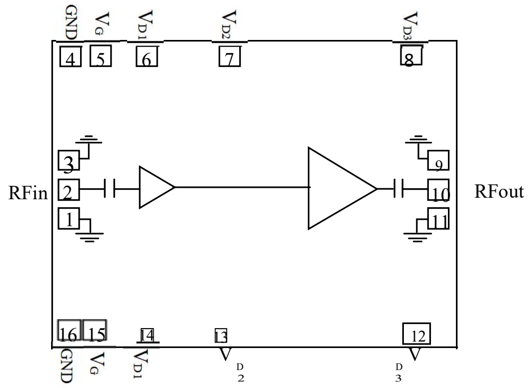
HX116791C-1617P80 GaN MMIC **power amplifier chip**, 16GHz ~ 17GHz

Performance Features

- Frequency range: 16GHz to 17GHz
- Power gain: 21dB
- Maximum output power: 49dBm
- Additional efficiency: 35%
- Static current: +48V@2.08A
- Chip dimensions: 6.0mm × 3.6mm × 0.08mm

functional block diagram



Product Overview

The HX116791C-1617P80 is a high-power amplifier chip implemented using GaN HEMT transistors, fabricated through the 0.35μm GaN power MMIC process. Capable of operating in both pulse and continuous wave modes, it covers a frequency range of 16GHz to 17GHz with power gains exceeding 21dB, saturated output power surpassing 49dBm, and power add-on efficiency above 35%. The chip features backside via grounding and dual power supply operation, with typical operating voltages of Vd=+48V and V_G=-1.8V. It is primarily applied in microwave transceiver components and high-power solid-state transmitters.

Microwave electrical parameters (TA = +25°C, Vd = +48V)

Metric	Symbol	Least value	Representative value	Crest value	Unit
Frequency range	f	16～17			GHz
Saturated output power	Psat	49			dBm
Power gain	Gp	21			dB
Power gain flatness	△Gp			±0.5	dB
Power added efficiency	PAE	35			%
Linear gain	Gain		29		dB
Linear gain flatness	△Gain			±0.5	dB
Input standing wave	VSWR(in)			2.5	-

Note: 1) All chips have undergone 100% DC test and 100% RF test in chip;

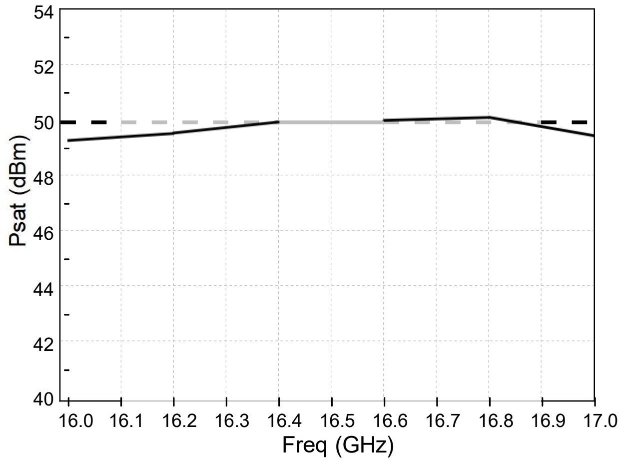
Use limit parameters

Parameter	Symbol	Limit value
Maximum drain-source forward bias voltage	Vd	+56V
Minimum gate-source negative bias	Vg	-5V
Maximum input power	Pin	+33dBm
End-use temperature	T_{op}	-55℃~+85℃
Storage temperature	T_{STG}	-65℃~+150℃

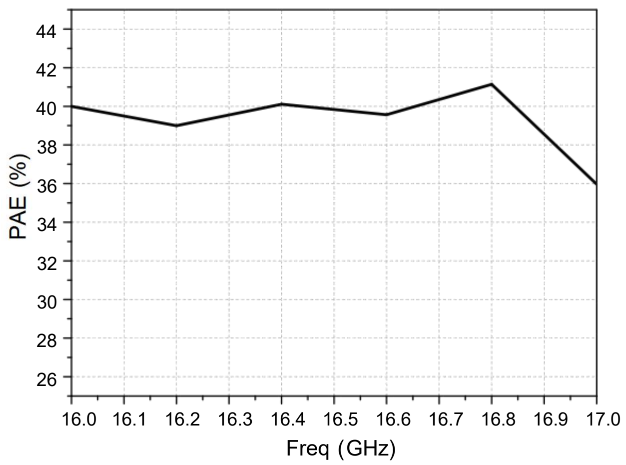
Representative Set of Curves

1 、 Test data (Vd=+48V, VGC=-1.8V, VG=-1.8V)

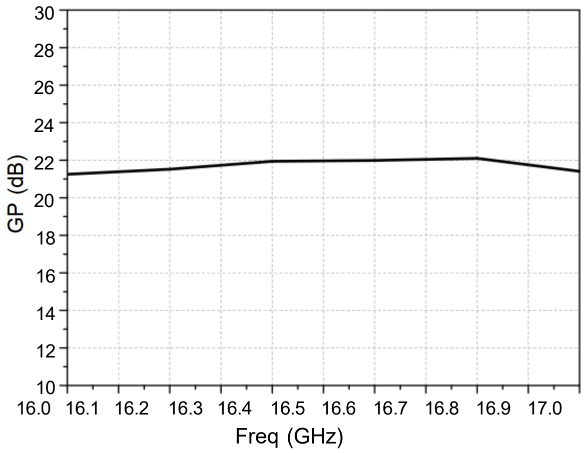
Maximum output power vs. frequency (Pin=28dBm)



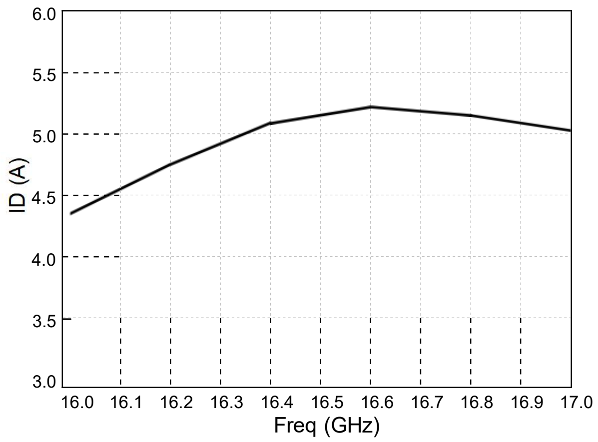
Additional efficiency vs. frequency (Pin=28dBm)



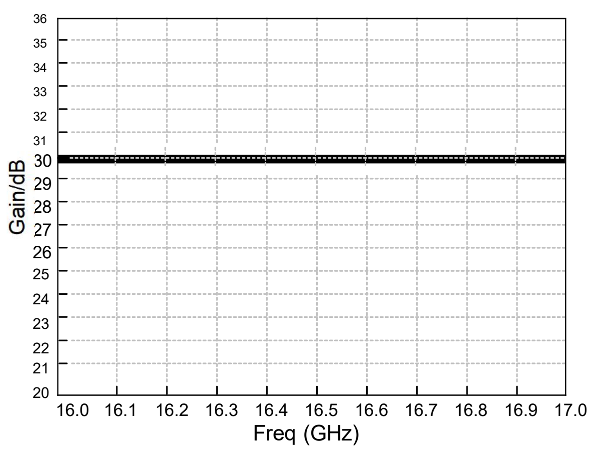
Power gain vs. frequency (Pin=28dBm)



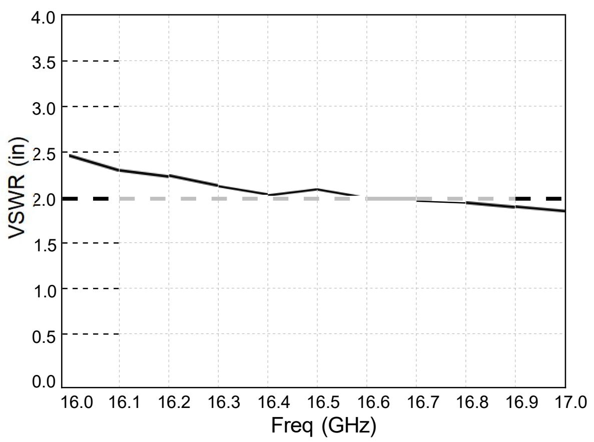
Drain dynamic current vs. frequency (Pin=28dBm)



Small signal gain vs. frequency (Pin=-20dBm)

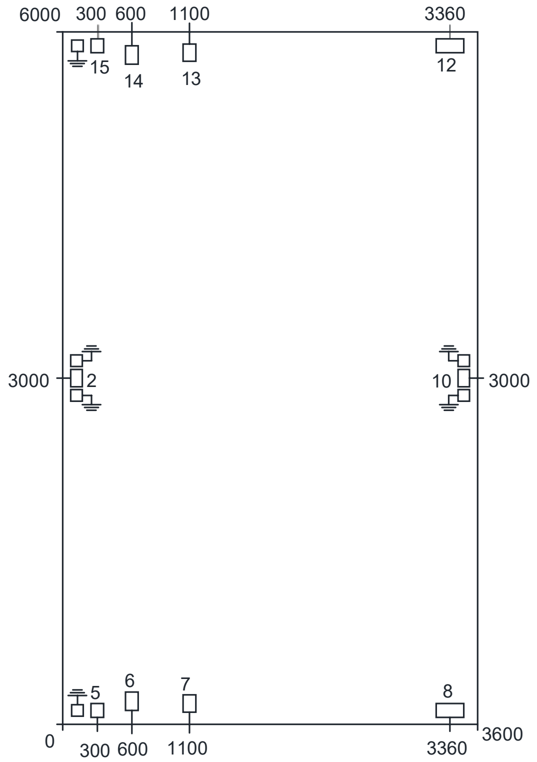


Enter standing wave vs. frequency (Pin=-20dBm)



External Dimensions and Pressure Point Arrangement Diagram

External dimensions of HX116791C-1617P80

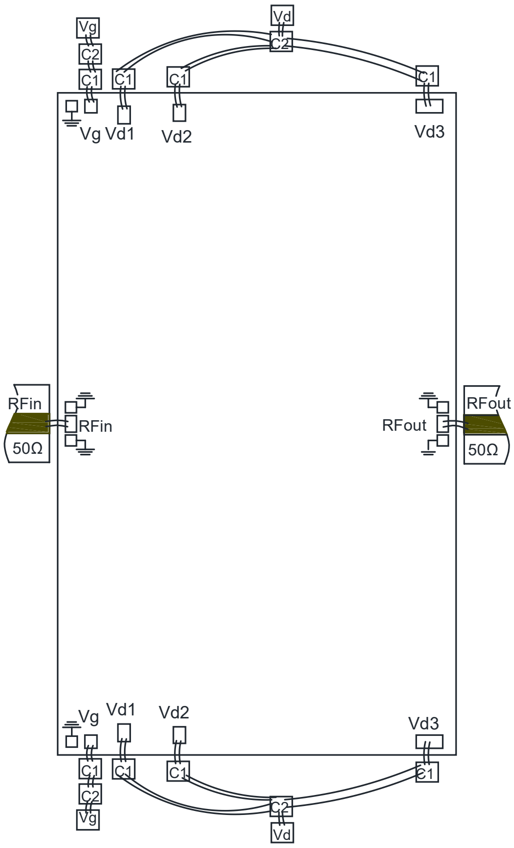


Note: The unit in the figure is micrometer (μm), with dimensional tolerance ±50μm.

Pressure Point Arrangement Diagram

Serial number	Symbol	Function	Size μm	Coordinate μm
1	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	
2	RF_{in}	Radio frequency input	$100 \times 150 \mu m^2$	120,3000
3	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	
4	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	
5	V_g	Gate bias bonding point	$110 \times 120 \mu m^2$	300,120
6	V_{d1}	First-level leak-bias bonding point	$110 \times 160 \mu m^2$	600,200
7	V_{d2}	Second-order leakage bias junction	$110 \times 150 \mu m^2$	1100,180
8	V_{d3}	Third-order leakage bias junction	$240 \times 120 \mu m^2$	3360,120
9	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	
10	RF_{out}	Radio frequency output	$100 \times 150 \mu m^2$	3480,3000
11	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	
12	V_{d3}	Third-order leakage bias junction	$240 \times 120 \mu m^2$	3360,5880
13	V_{d2}	Second-order leakage bias junction	$110 \times 150 \mu m^2$	1100,5840
14	V_{d1}	First-level leak-bias bonding point	$110 \times 160 \mu m^2$	600,5800
15	V_g	Gate bias bonding point	$110 \times 120 \mu m^2$	00,5880
16	*GND*	Probe testing for grounding purposes	$100 \times 100 \mu m^2$	

Recommended Assembly Drawing



Note: 1) The capacitance values for peripheral capacitors are C1=100pF and C2=1000pF. These capacitors should be positioned as close as possible to the chip, with a maximum distance of 300μm.

2) The length of the input-output key alloy wire should be controlled within 300μm ± 50μm, with a minimum possible length.

Matters Need Attention

1) For use in environmental purification systems;
2) GaN materials are brittle and their chip surfaces are highly susceptible to damage (avoid direct contact with the surface). Exercise caution during handling.
3) The input and output connections should use two bonding wires (25μm diameter gold wires), with the bonding wires kept as short as possible, not exceeding 300μm in length.
4) The input and output are connected by 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.