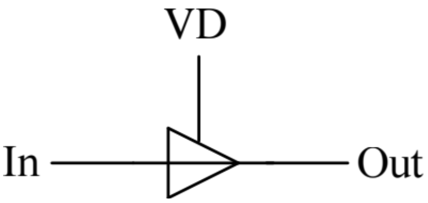
HX10476C-0820/HX10476C-0820M GaAs MMIC
Low-noise amplifier chip, 0.8GHz～2.0GHz

Performance Features

- Frequency range: 0.8 GHz to 2.0 GHz
- Linear gain: 31.5dB
- noise： 0.4dB
- output P1dB：≥11dBm
- Enter the return loss: ≤-7dB
- Output return loss: ≤-10dB
- Static operating current: approximately 29mA at 5V
- Chip dimensions: 1.70mm × 1.40mm × 0.07mm

functional block diagram



Product Overview

The HX10476C-0820 and HX10476C-0820M are two GaAs MMIC low-noise amplifier chips. The HX10476C-0820M is a mirror-image circuit design of the HX10476C-0820, covering a frequency range of 0.8GHz to 2.0GHz with approximately 31.5 dB gain and an in-band noise figure below 0.5dB. Manufactured using GaAs EPHEMT technology, the chips feature backside via grounding, eliminating the need for additional grounding measures.

DC parameters (T_A= +25 °C, 50Ω system)

Parameter name	Symbol	Least value	Representative value	Crest value	Unit
Drain operating voltage	V_D		5		V
Static operating current	I_D	25	29	34	mA

Microwave electrical parameters (T_A= +25 °C, 50Ω system, electrical characteristics)

Parameter name	Symbol	Least value	Representative value	Crest value	Unit
Service frequency	f	0.8~2			GHz
Linear gain	G_{lin}	31	31.5	32	dB
Linear gain flatness	ΔG_{in}	-1		+1	dB
Noise	NF_{Rx}		0.4	0.5	dB
1dB compression point output power	$P_{o(1dB)\_}$	11	12		dBm
Input return loss	RL_{i_Rx}			-7	dB
Output return loss	RL_{o_Rx}			-10	dB

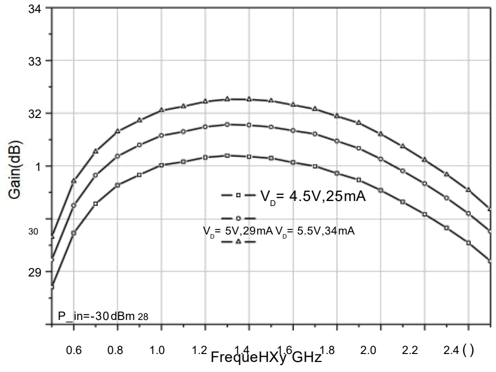
Note: 1) All chips underwent in-situ 100% microwave testing.

Limit parameters:

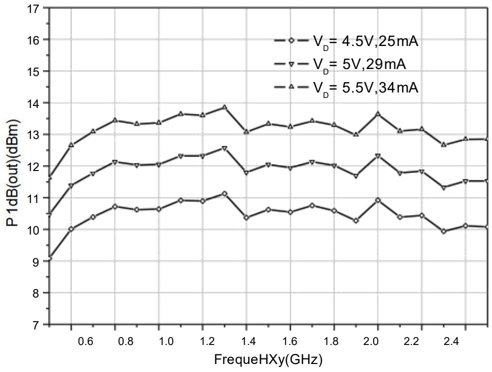
Parameter	Symbol	Limit value
Maximum operating voltage of drain	V_D	+6V
Maximum input power (CW)	P_{in}	15dBm
Storage temperature	T_{stg}	-65 °C～+150 °C
Operating temperature range	T_A	-55°C～+125°C
Maximum operating channel temperature	T_{ch}	+175 °C

representative set of curves

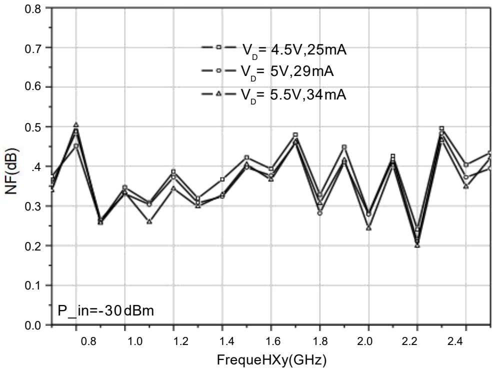
Linear gain vs. frequency



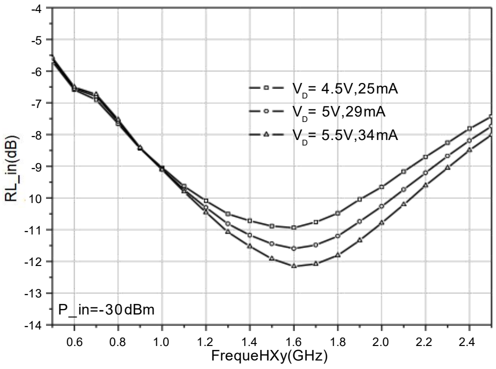
1dB compression point output power vs. frequency



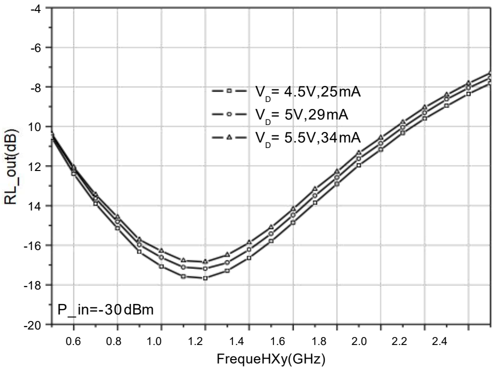
Noise coefficient vs. frequency



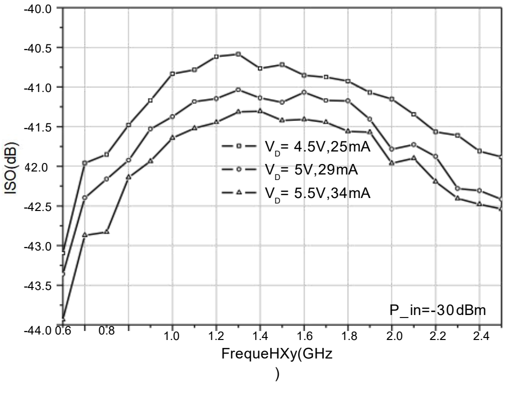
Input return loss vs. frequency



Output Echo Loss vs. Frequency

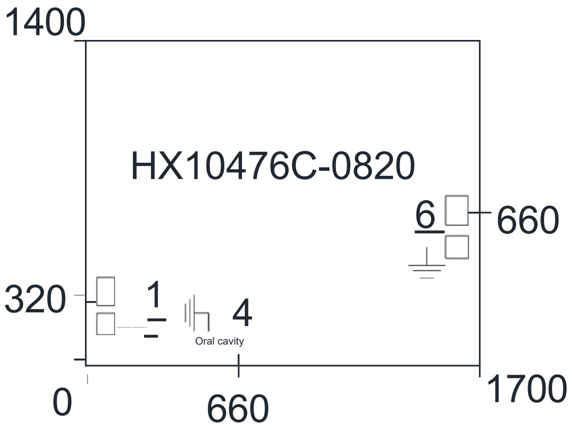


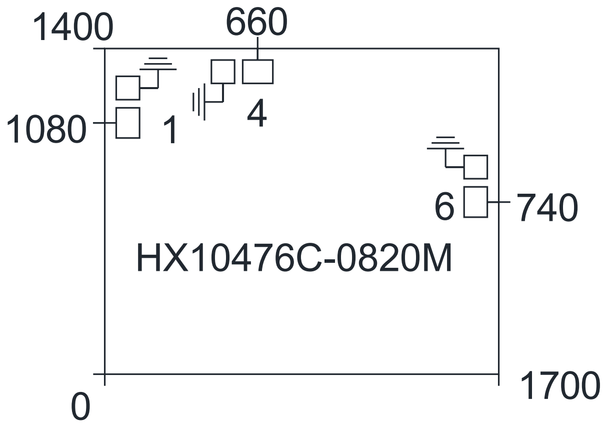
Reverse isolation vs. frequency



External dimensions and pressure point arrangement diagram

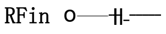
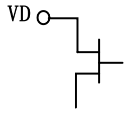
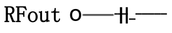
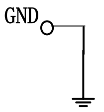
The external dimensions of HX10476C-0820 and HX10476C-0820M



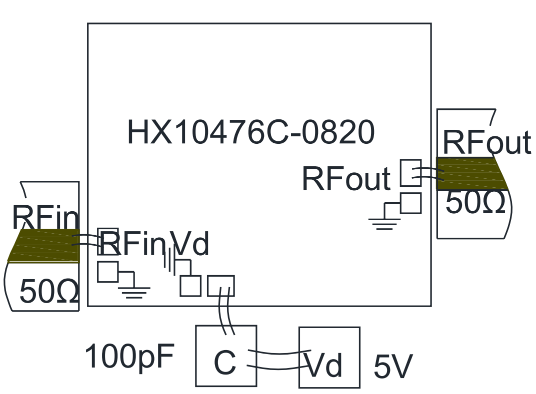


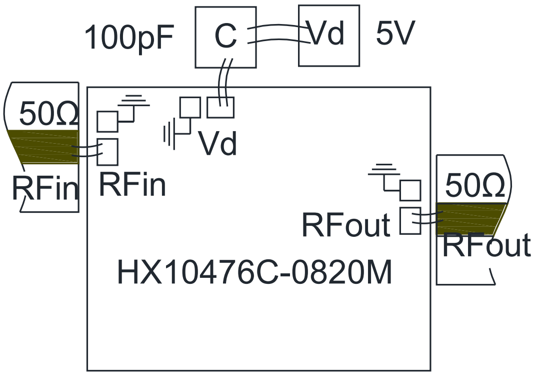
Note: All units in the figure are in micrometers (μm); dimensional tolerance ±100μm.

Pressure Point Arrangement Diagram

Serial number	Symbol	Function	Size	Port Description	Equivalent Circuit Diagram of Ports
1	RFin	Radio frequency input terminal	100×130μm^2	AC coupling, impedance 50 ohms.	
4	V$_D$	Drain power supply power supply terminal	130×100μm^2	The receiving channel amplifier is powered by DC supply.	
6	RFout	Radio frequency input terminal	100×130μm^2	AC coupling, impedance 50 ohms.	
2、3、5	GND	Grounding contact point	100×100μm^2	Medium through-hole connection with back metal	

Recommended assembly drawing





Matters Need Attention

1） Single-chip circuits must be stored in a dry and clean nitrogen (N2) environment.

2） The chip substrate material GaAs is brittle and must be handled with care to avoid damaging the chip.

3） The chip surface lacks an insulating protective layer, necessitating attention to the cleanliness of the assembly environment to prevent excessive surface contamination.

4） The thermal expansion coefficient of the carrier should be close to that of GaAs, with a linear thermal expansion coefficient of 4.2×10^{-6}/℃. It is recommended to use CuMoCu, CuMo, or CuW as the carrier material.

5） During assembly, avoid gaps between the chip and the carrier while ensuring effective heat dissipation between the housing and the carrier.

6） It is recommended to use gold-silver solder for sintering with Au:Sn=80%:20%, where the sintering temperature should not exceed 300°C and the duration should not exceed 30 seconds. The sintering process should avoid rapid temperature changes and require gradual temperature rise and fall.

7） It is recommended to use gold wires with a diameter of 25μm to 30μm, maintain the temperature of the bonding platform base below 250°C, minimize bonding time, and avoid rapid temperature fluctuations during the bonding process.

8） During power-on, apply gate voltage before drain voltage; during power-off, first reduce drain voltage then gate voltage.

9） All microwave ports within the chip are equipped with DC-blocking capacitors.

10）During chip usage and assembly, attention must be paid to anti-static measures, including wearing grounded anti-static wristbands and ensuring proper grounding of sintering and bonding platforms.

11）We offer a wide range of shell-and-tube package products.

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

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