GLA-6686

Low Noise Amplifier，66-86GHz

Performance characteristics

- ✧ Frequency range: 66GHz~86GHz
- ✧ Small signal gain: 21dB
- ✧ Noise figure:3.6dB
- ✧ P1dB: 14dBm
- ✧ DC Supply: Vd=10V@Id=90mA (Vg≈-1.5V)
- ✧ Dimensions: 3.00 mm×1.30 mm×0.05 mm

Product Description

GLA-6686 is an E-band broadband low noise amplifier chip with a frequency range of 66GHz~86GHz, small signal gain of 21dB and a typical noise figure of 3.6dB.

Electrical Specifications

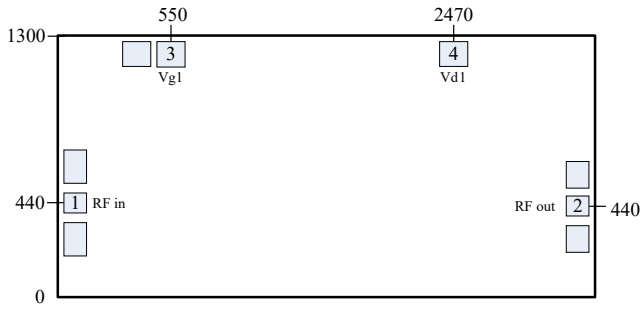
(Vd=10V，Id=90mA，TA=+25℃)

Parameter	Min	Typ	Max	Unit
Frequency range	66		86	GHz
Small signal gain		21		dB
Gain flatness		±1.5		dB
Noise figure		3.6		dB
P1dB		14		dBm
Input VSWR		2.5		-
Output VSWR		1.5		-
Quiescent Current		90		mA

Absolute Maximum Ratings

Maximum Drain Voltage	15V
Maximum Input RF Power	30dBm
Storage Temperature	-65℃~150℃
Operating Temperature	-55℃~85℃

Die Outline Dimensions



Notes: 1) All dimensional units are micrometers (μm).

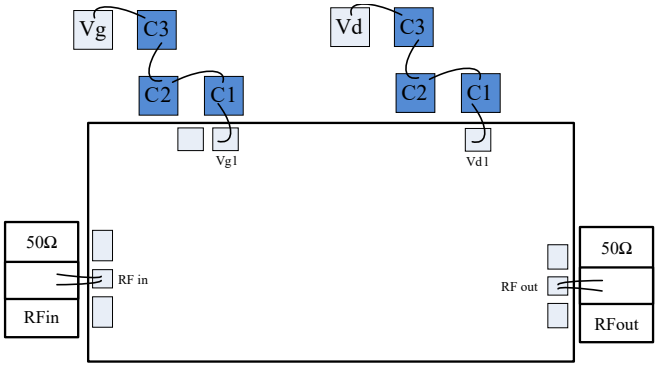
2) Tolerance for die length and width: ±50 μm.

3) Die thickness: 50 μm.

Bond Pad Definition

No.	Symbol	Function Description	Pad Size(μm^2)
1	RFin	RF input port, matched to 50Ω system. No series DC blocking capacitor required	80×80
2	RFout	RF output port, matched to 50Ω system. No series DC blocking capacitor required	80×80
3	Vg1	Gate bias supply pin; 100 pF, 1000 pF and 10 μF shunt bypass capacitors are required externally.	120× 40
4	Vd1	Drain bias supply pin; 100 pF, 1000 pF and 10 μF shunt bypass capacitors are required externally.	150×100

Recommended Assembly Schematic



Note: The external capacitors have the following capacitance values: C1 = 100 pF, C2 = 1000 pF, C3 = 10 μF. A single-layer capacitor is recommended for C1, which shall be placed as close as possible to the chip bonding pads.

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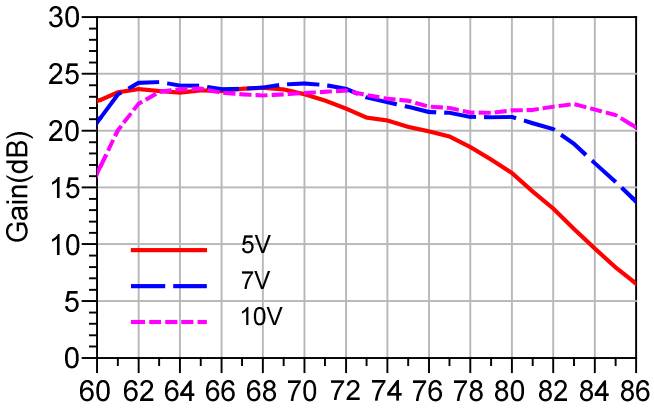
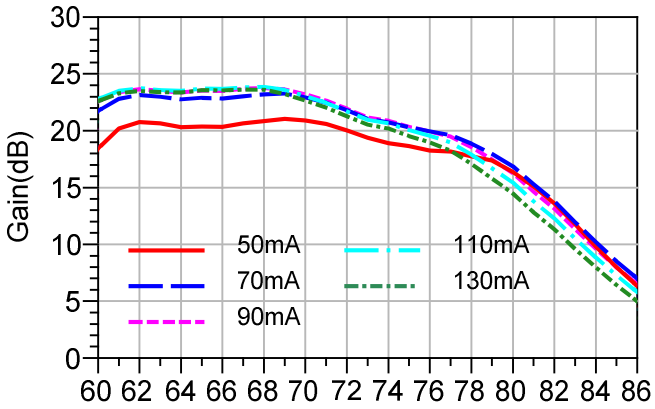
On-Wafer Measurement Curves（T_A=+25℃）Vd=10V，Id=90mA

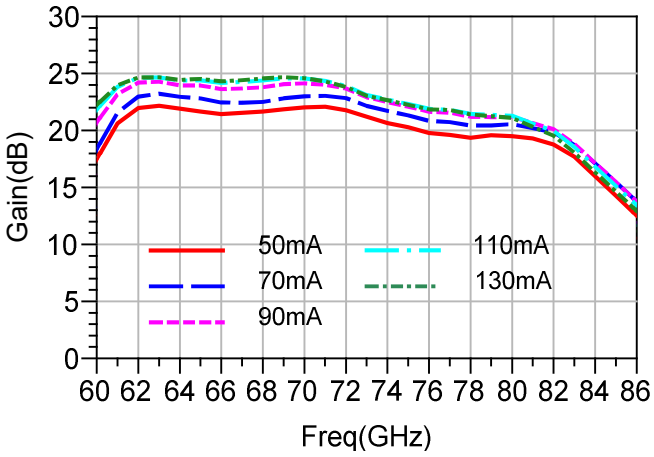
Small Signal Gain vs. Voltage @ 90 mA



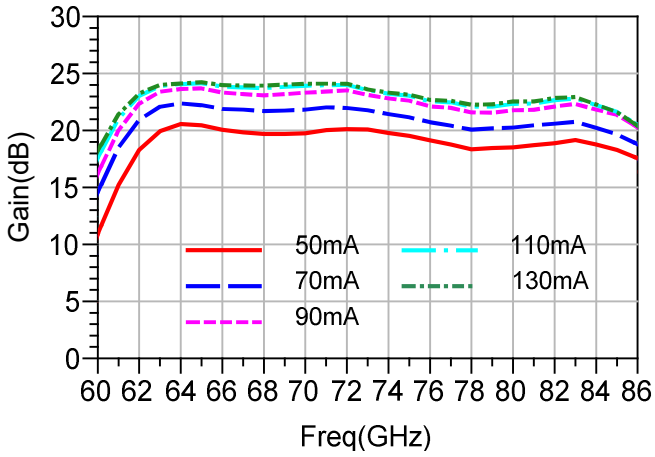
Small Signal Gain vs. Current @ 5 V



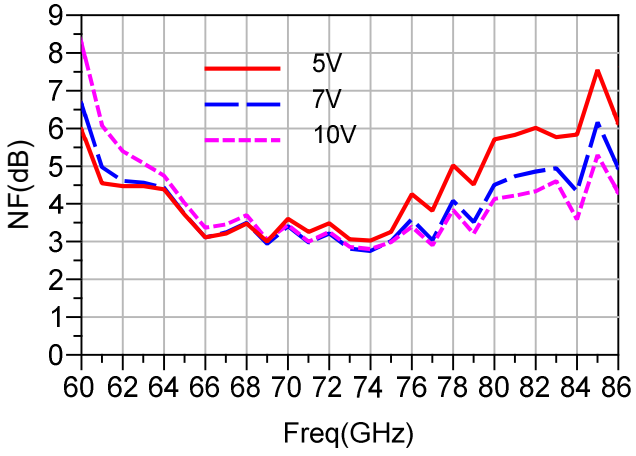
Small Signal Gain vs. Current @ 7 V



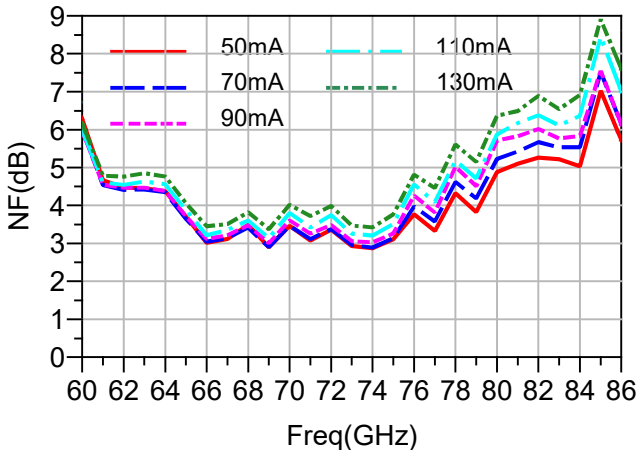
Small Signal Gain vs. Current @ 10 V



Noise Figure vs. Voltage @ 90 mA



Noise Figure vs. Current @ 5 V



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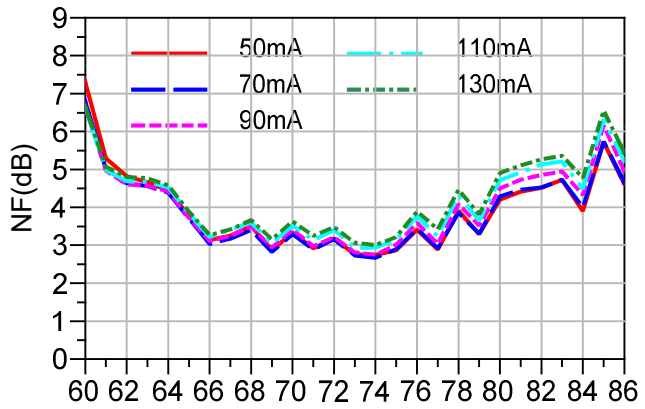
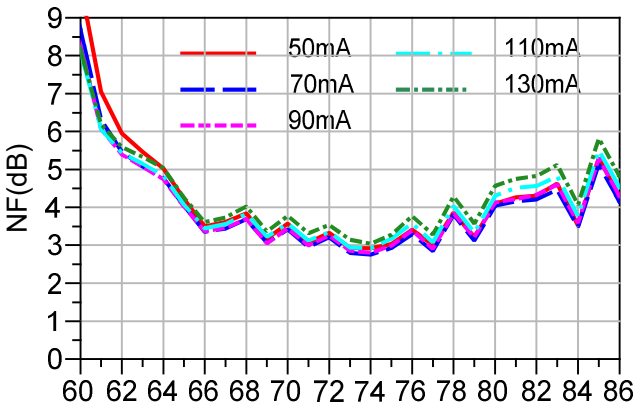
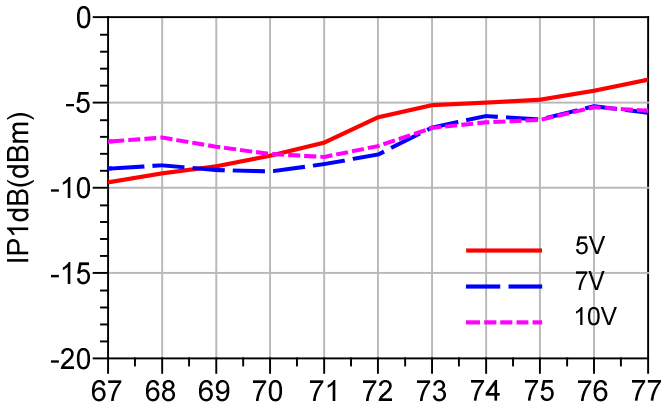
Noise Figure vs. Current @ 7 V



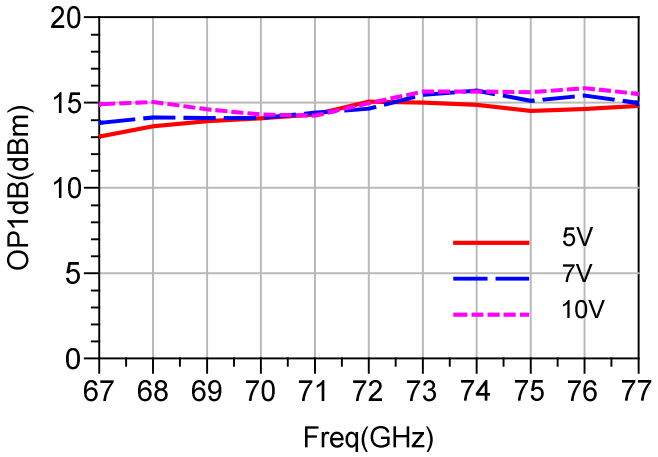
Noise Figure vs. Current @ 10 V



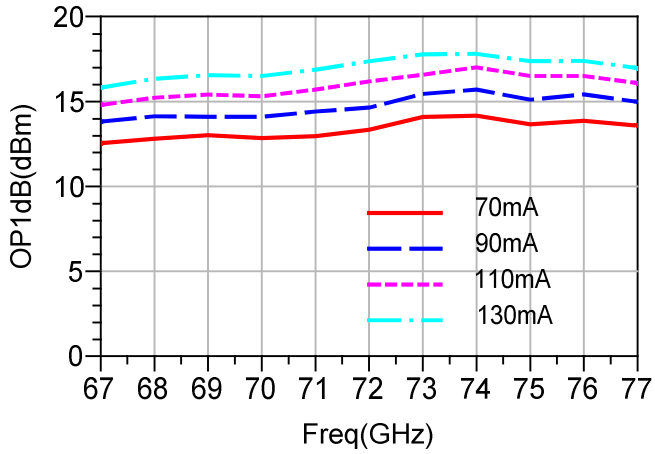
IP1dB vs. voltage @ Id=90mA



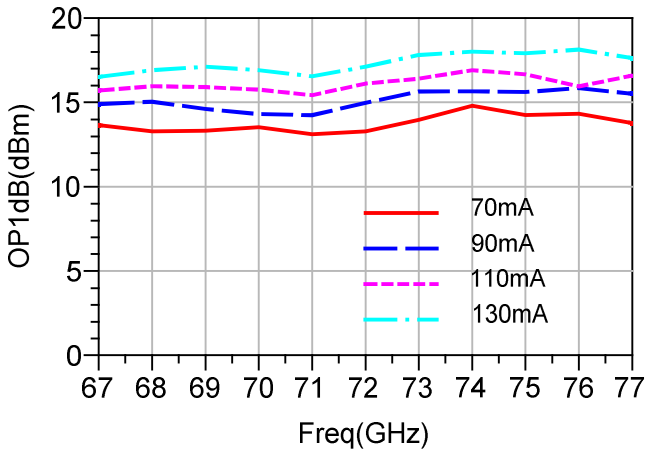
OP1dB vs. voltage @ Id=90mA



OP1dB vs. current @ Vd=7V



OP1dB vs. current @ Vd=10V



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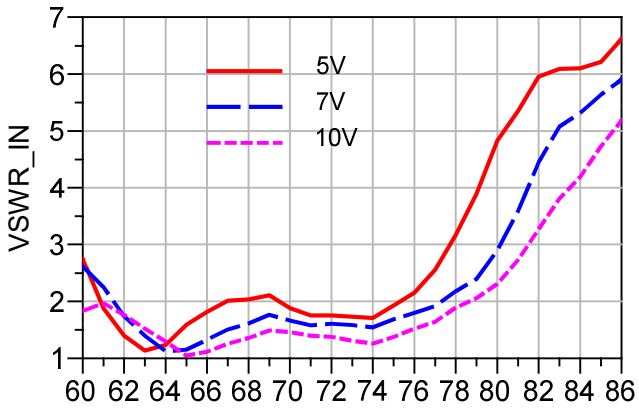
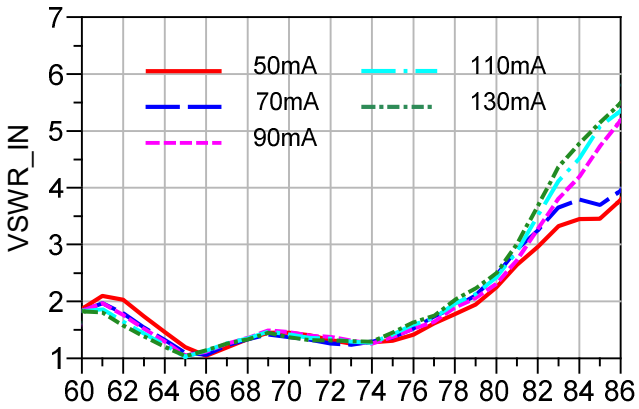
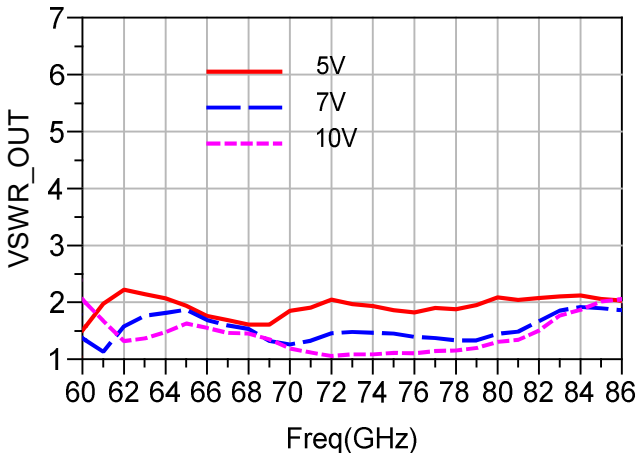
Input VSWR vs. voltage @ Id=90mA



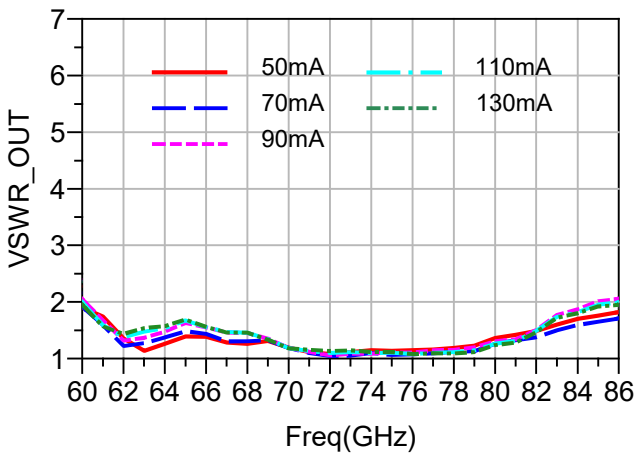
Input VSWR vs. current @ Vd=10V



Output VSWR vs. voltage @ Id=90mA



Output VSWR vs. current @ Vd=10V



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Handling & Operating Precautions

1) Storage: Dies must be stored in ESD-protected containers under nitrogen atmosphe

2) Cleaning: All die handling shall be performed in a cleanroom environment. Liquid cleaning solvents are prohibited for die cleaning. die handling shall be performed in a cleanroom environment. Liquid cleaning solvents are prohibited for die cleaning.

3) ESD Protection: Strictly follow all ESD control protocols to prevent electrostatic damage to the die.

4) General Handling: Handle dies only with vacuum pick-up tools or precision fine-tip tweezers. Avoid contact between tools/fingers and the die surface.

5) Power-up & Power-down Sequence: Power-up: Apply gate voltage first, then drain voltage.Power-down: Remove drain voltage first, then gate voltage.

6) Die Mounting: Two acceptable processes are AuSn eutectic sintering or conductive epoxy bonding. The mounting substrate surface must be clean and flat; minimize the gap between the die and RF input/output substrate traces.

- Sintering Process: Use 80/20 AuSn solder. Sinter temperature shall not exceed 300℃, total sinter time ≤20 seconds, scrub time ≤3 seconds.
- Epoxy Bonding: Apply minimal conductive epoxy dosage; follow curing specifications provided by epoxy supplier.

7) Wire Bonding Requirements:

- Unless otherwise specified, use two 25μm diameter gold bonding wires for RF input and output, with shortest possible wire length.
- Thermosonic bonding temperature: 150℃; use minimum feasible ultrasonic power. Ball bonding capillary force: 40~50gf; Wedge bonding capillary force: 18~22gf.

8) Contact your supplier for technical support if any issues occur.