SAC4021

GaAs MMIC Low Noise Amplifier
18~40GHz

Rev 1.1

Features

- Frequency: 18~40GHz
- Gain: 20dB
- Output P_{-1}dB: 13dBm@28GHz
- Supply Voltage: +5V@87mA
- Die Size: 1.0mm×1.4mm×0.1mm

Typical Applications

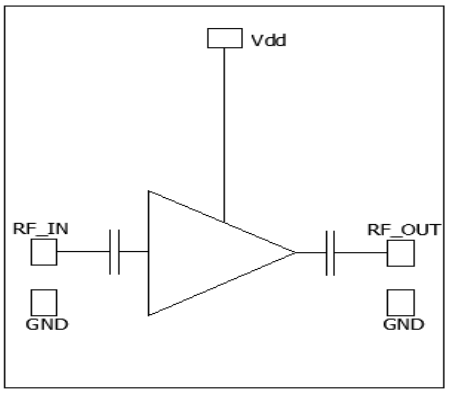
- Microwave radio including point to point communication
- Telecommunication
- Test instrumentation
- SatCom

General Description

SAC4021 is a GaAs MMIC Low Noise Amplifier die which operates between 18GHz~40GHz. The amplifier can provide 20dB gain, 13dBm OutputP_{-1}dB,2.0dB noise figure from an 87mA supply current.

The chip offers full passivation for increased reliability and moisture protection. This amplifier is the perfect alternative to higher cost hybrid amplifiers.

Functional Diagram



Electrical Performance

T_A=25℃, V_D=+5V, I_D=85mA, Z_0=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range		18 ~ 40		GHz
Gain	17	20	25	dB
Gain Flatness	—	±1	±3	dB
Reverse Isolation	—	50	—	dB
Input VSWR	—	1.8	2.5	:1
Output VSWR	—	1.6	2.2	:1
Noise Figure	—	2.0	2.5	dB
Output Power for 1 dB Compression (OP_{-1}dB)	10	13	—	dBm
Supply Current (I_D)	—	87	—	mA
Thermal Resistance	—	42	—	℃/W

Absolute Maximum Ratings

Maximum Input Power	+15dBm	Operating Temperature	-55℃ ~ +85℃
Channel Temperature	+150℃	Storage Temperature	-65℃ ~ +150℃

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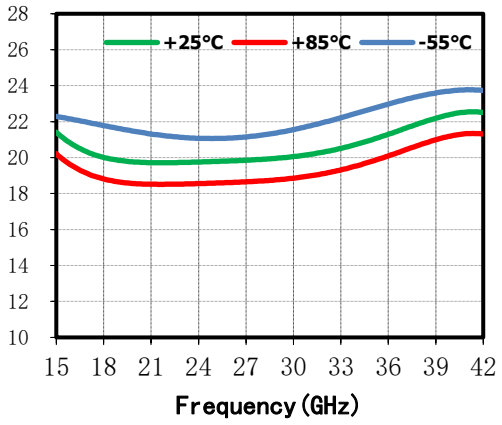
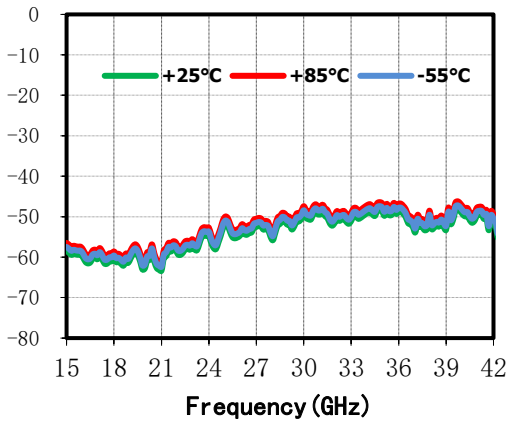
Typical Performance Curve

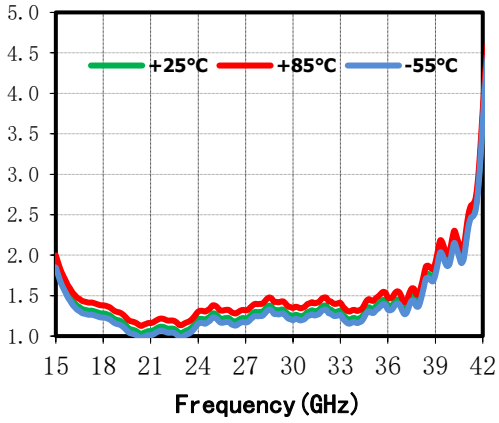
Small Sigal Gain(dB) vs.Temperature



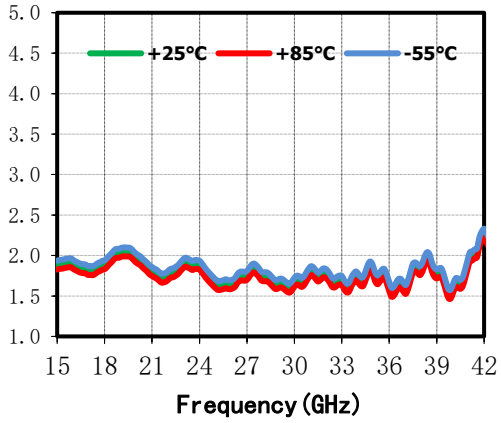
Isolation(dB) vs.Temperature



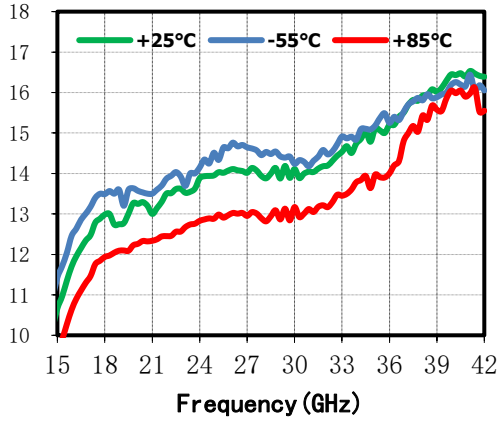
Input VSWR(:1) vs.Temperature



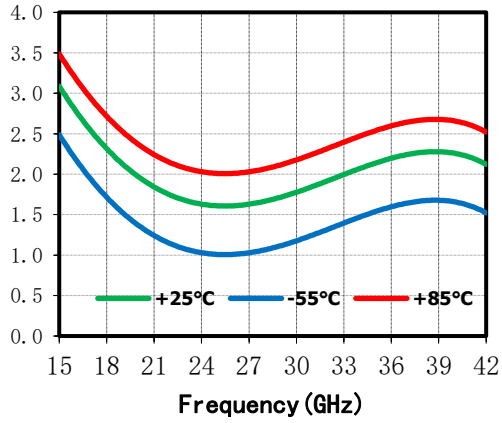
Output VSWR(:1) vs.Temperature



OP-1dB (dBm) vs. Temperature



Noise Figure(dB) vs.Frequency



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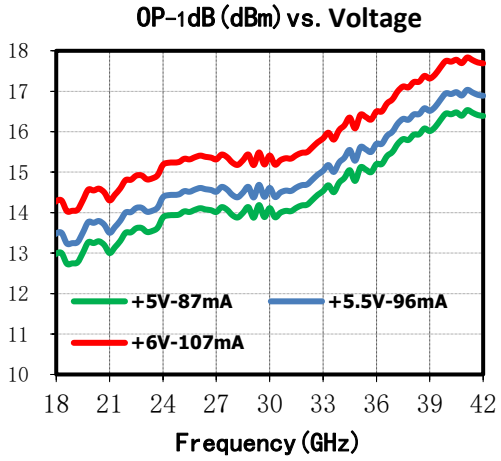

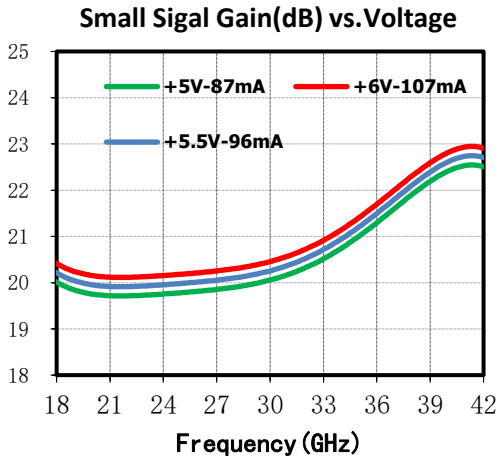

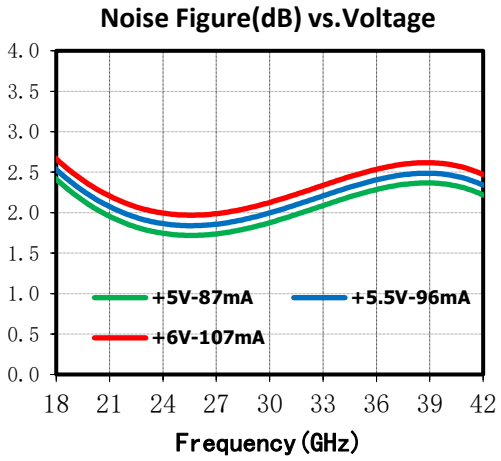

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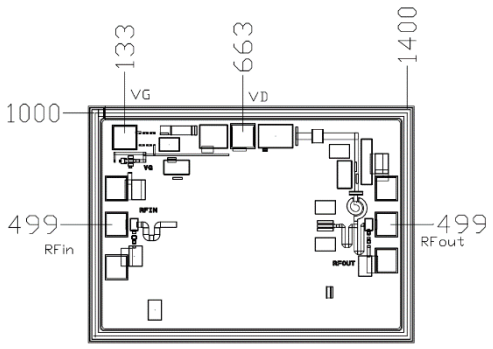
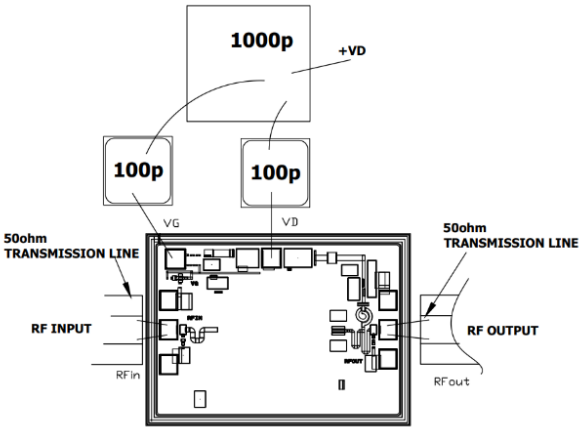
Die Outline

All dimensions in µm



Assembly Diagram



Attention:

1. The back of chip is RF ground.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. Bypass SLCs should be placed as close as possible to the chip.
4. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.
5. The RF input and RF output ports withstand voltage is 12V,
6. The ESD Sensitivity (HBM) of SAC4021 is Class 0.

Legs are coated with gold-plated 4um thickness.

Revision History

Revision	Date	Comment
1.0	Feb 04, 2024	First Release
1.1	Mar 12, 2024	Add voltage data

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