SAC4019

GaAs MMIC Low Noise Amplifier
18~40GHz

Rev 1.0

Features

- Frequency: 18~40GHz
- Gain: 22dB
- Output P_{-1}dB: 10dBm@30GHz
- Supply Voltage: +5V@37mA
- Die Size: 1.1mmx1.7mmx0.1mm

Typical Applications

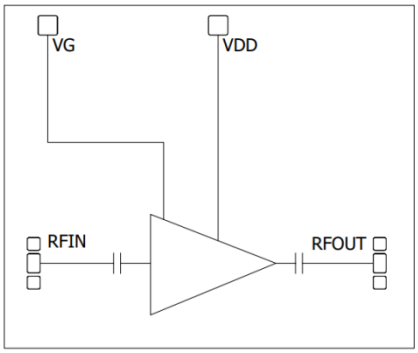
- Microwave radio including point to point communication
- Telecommunication
- Test instrumentation
- SatCom

General Description

SAC4019 is a GaAs MMIC Low Noise Amplifier die which operates between 18GHz ~ 40GHz. The amplifier can provide 22dB gain, 10dBm OutputP_{-1}dB, 1.8dB noise figure from a 37mA 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=37mA, Z_0=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range		18~40		GHz
Gain	16	22	26	dB
Gain Flatness	—	±1	±2	dB
Reverse Isolation	—	50	—	dB
Input VSWR	—	1.5	2.0	:1
Output VSWR	—	1.5	2.0	:1
Noise Figure	—	1.8	—	dB
Output Power for 1 dB Compression (OP$_{-1}$dB)	7	10	—	dBm
Supply Current (I_D)	—	37	—	mA

Absolute Maximum Ratings

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

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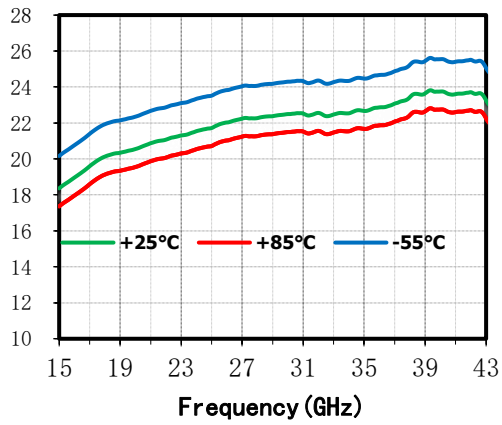
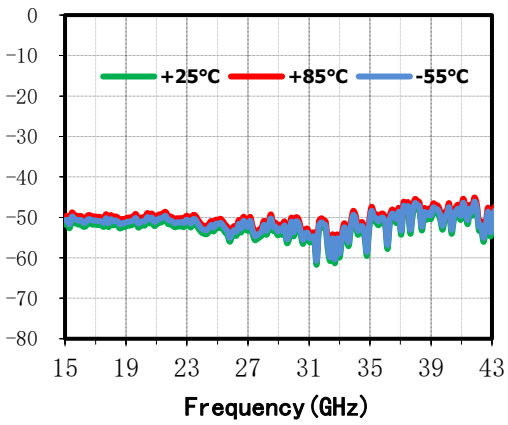
Typical Performance Curve

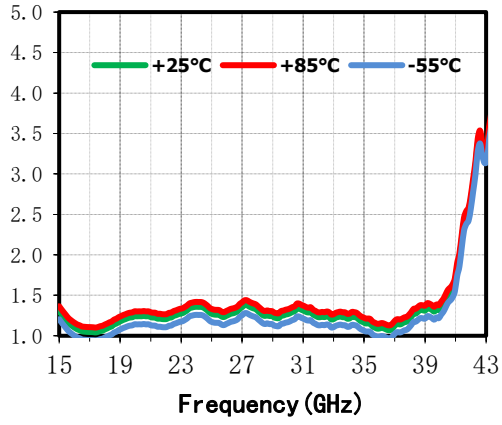
Small Sigal Gain(dB) vs.Temperature



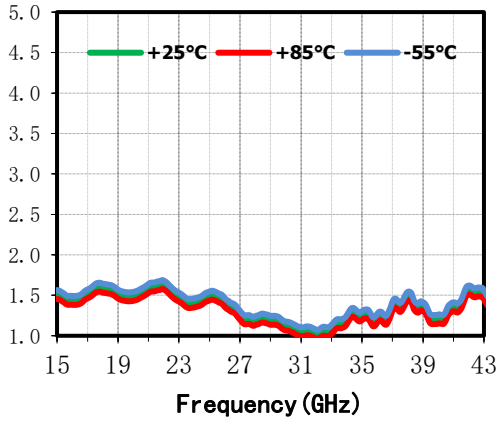
Isolation(dB) vs.Temperature



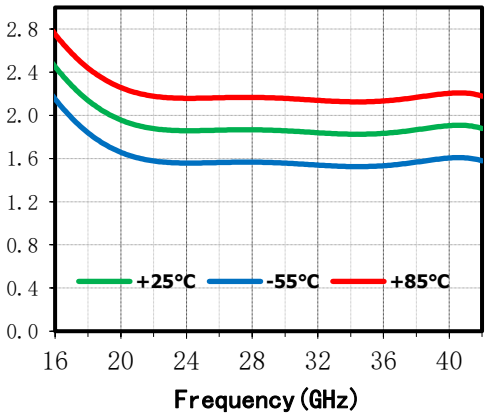
Input VSWR(:1) vs.Temperature



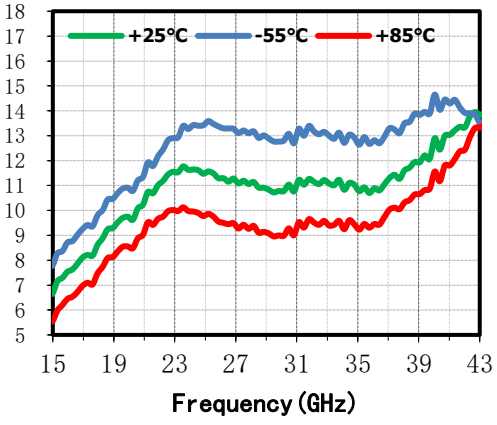
Output VSWR(:1) vs.Temperature



Noise Figure(dB) vs.Frequency



OP-1dB (dBm) vs. Temperature



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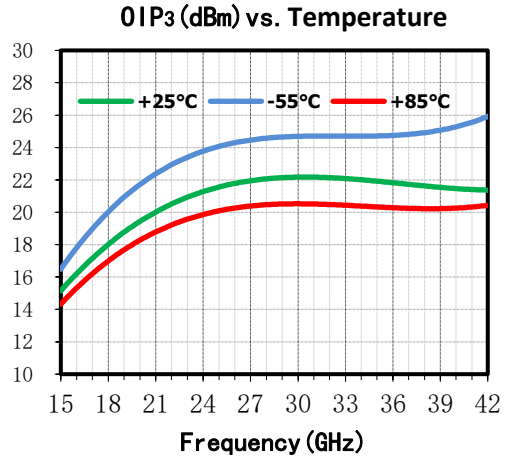
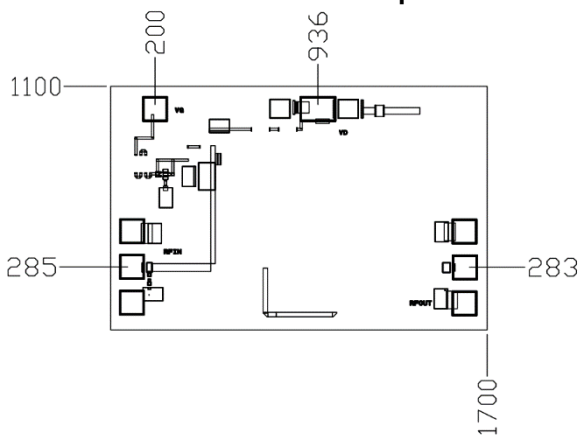
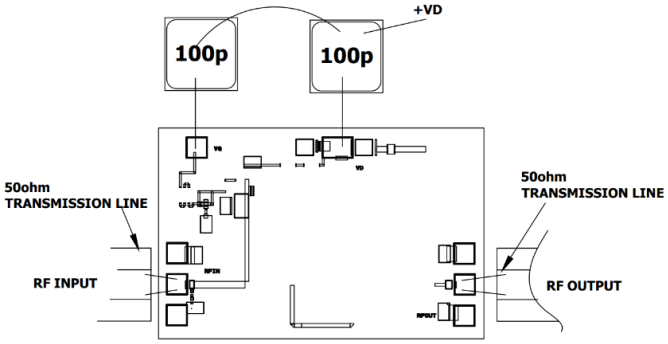


Die Outline

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. Use of a 0.8mil the rmosonic wedge bonding is highly recommended as the loop height will be minimized.
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 SAC4019 is Class 0.

Revision History

Revision	Date	Comment
1.0	JAN 28, 2024	First Release

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