

## Features

- Frequency: 18~40GHz
- Gain: 20dB
- Output P<sub>-1dB</sub>: 12dBm@28GHz
- Supply Voltage: +5V@85mA
- Die Size: 1.0mm×1.4mm×0.1mm

## Typical Applications

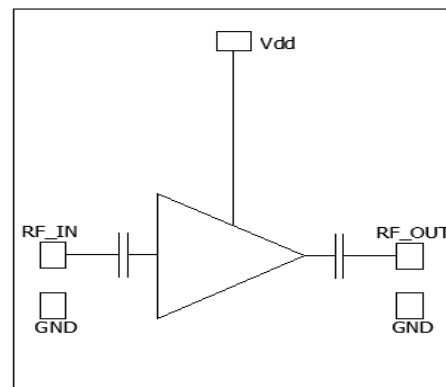
- Microwave radio including point to point communication
- Telecommunication
- Test instrumentation
- SatCom

## General Description

SAC4020 is a GaAs MMIC Low Noise Amplifier die which operates between 18GHz~40GHz. The amplifier can provide 20dB gain, 12dBm Output P<sub>-1dB</sub>, 2.0dB noise figure from an 85 mA 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<sub>A</sub>=25°C, V<sub>D</sub>=+5V, I<sub>D</sub>=85mA, Z<sub>0</sub>=50Ω

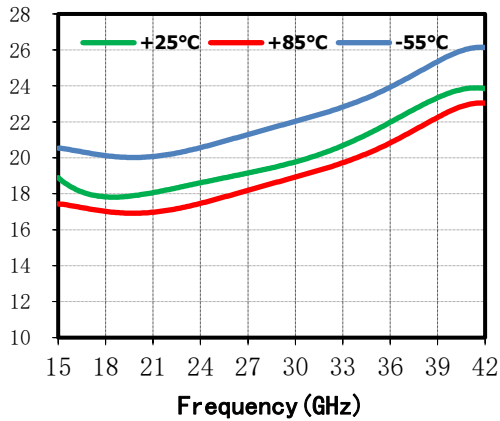
Parameter	Min.	Typ.	Max.	Units
Frequency Range	18 ~ 40			GHz
Gain	17	20	25	dB
Gain Flatness	—	±1	±3	dB
Reverse Isolation	—	50	—	dB
Input VSWR	—	1.8	2.2	:1
Output VSWR	—	1.6	2.1	:1
Noise Figure	—	2.0	2.5	dB
Output Power for 1 dB Compression (OP <sub>-1dB</sub> )	10	12	—	dBm
Supply Current (I <sub>D</sub> )	—	85	—	mA
Thermal Resistance	—	42	—	°C/W

## Absolute Maximum Ratings

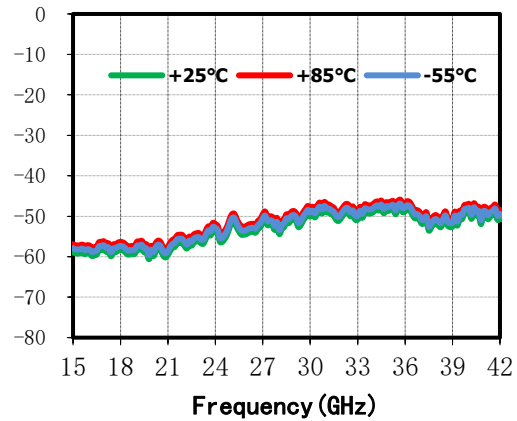
Maximum Input Power	+15dBm	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C

## Typical Performance Curve

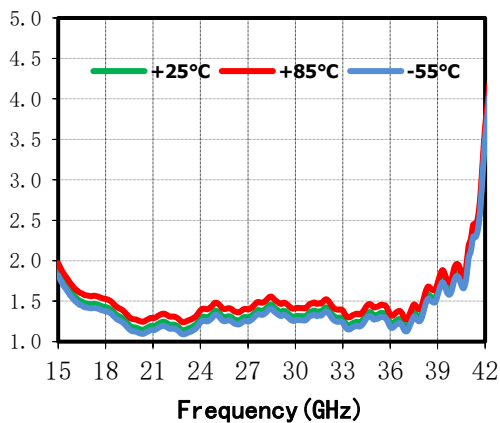
Small Sigal Gain(dB) vs.Temperature



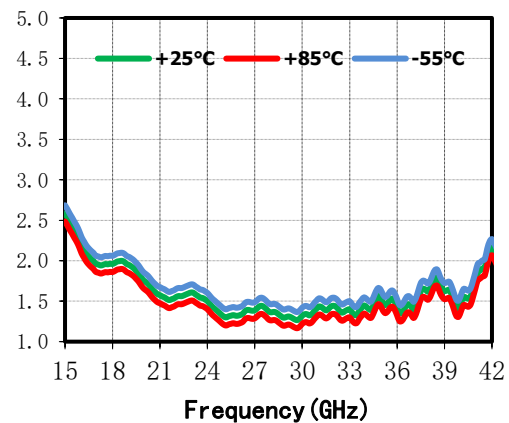
Isolation(dB) vs.Temperature



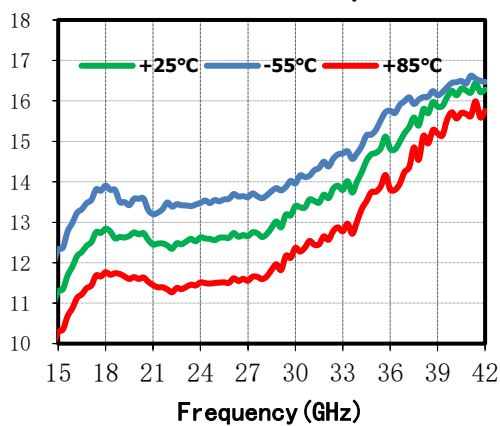
Input VSWR(:1) vs.Temperature



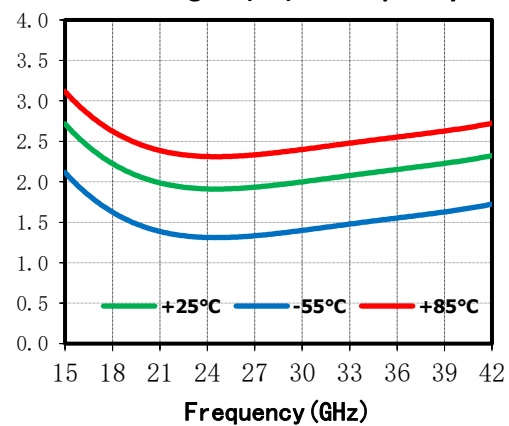
Output VSWR(:1) vs.Temperature



OP-1dB (dBm) vs. Temperature



Noise Figure(dB) vs.Frequency



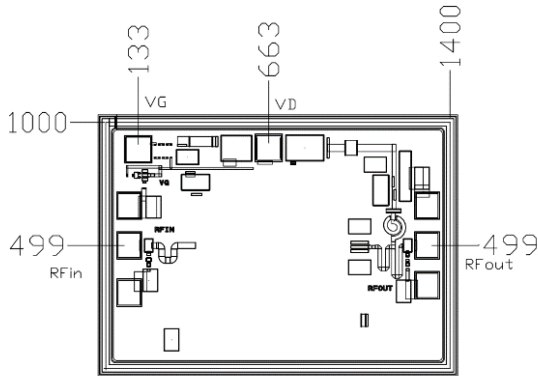
# SAC4020

GaAs MMIC Low Noise Amplifier  
18~40GHz

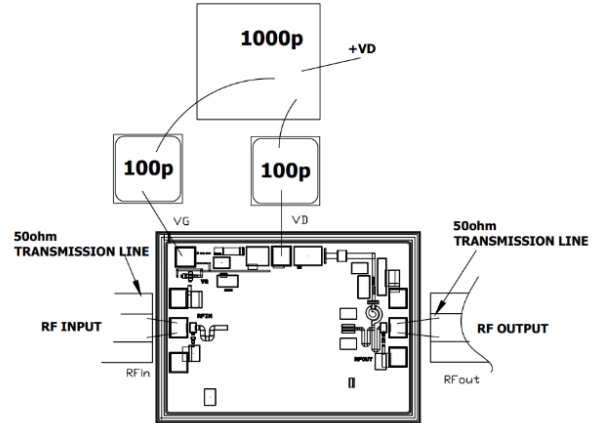
Rev 1.0

## Die Outline

All dimensions in  $\mu\text{m}$



## 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 SAC4020 is Class 0.

Legs are coated with gold-plated 4um thickness.

## Revision History

Revision	Date	Comment
1.0	Feb 04, 2024	First Release