SAC4012Q4

GaAs MMIC Low Noise Amplifier
8.5GHz~11GHz

Rev 1.5

Features

- Frequency: 8.5 ~ 11GHz
- Gain: 35dB
- $OP_{-1}dB$: 11dBm typ., 10dBm min.
- Power supply: +3.3 ~ 5V
- Package: 4mm×4mm×1.25 (Typ.) mm

Typical Applications

- Radar

General Description

SAC4012Q4 is a GaAs MMIC Low Amplifier in QFN surface mount package, which operates from 8.5GHz to 11GHz.

Electrical Performance

T_A=25℃, V_D=+4V, I_{DQ}=40 mA, Z_0=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	11	GHz
Small Signal Gain	33	35	—	dB
Gain Flatness	—	±1	±1.3	dB
Reverse Isolation	—	-55	—	dB
Noise Figure	—	1.2	1.3	dB
RF Input/Output VSWR	—	1.5	2.0	:1
Output $P_{-1}dB$	10	11	—	dBm
Supply Current (ID)	—	—	50	mA

Absolute Maximum Ratings

Maximum Input Power	+23dBm, No damage	Operating Temperature	-55°C ~ +85°C
Channel Temperature	+150°C	Storage Temperature	-55°C ~ +150°C
Maximum VD	+6.5V		

RoHS

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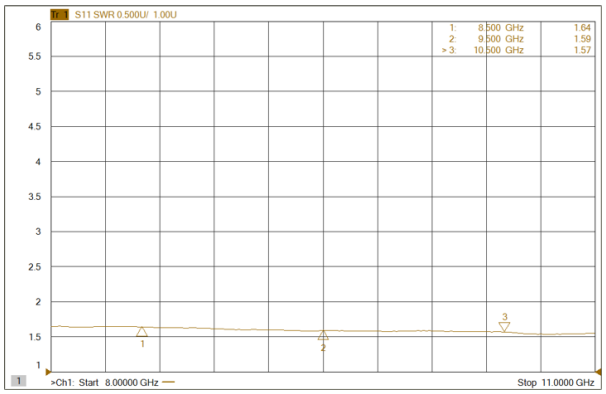
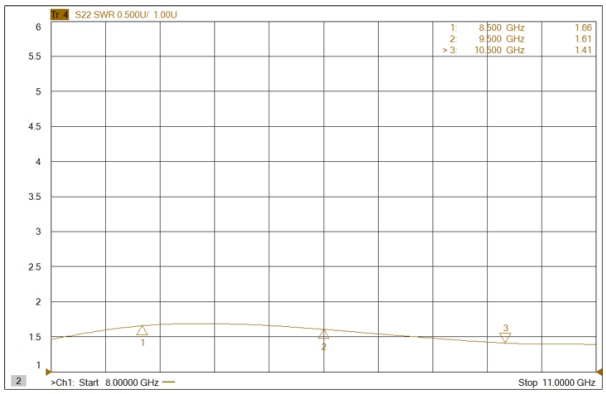
Typical Performance Curve

V_D=+4V, I_{DQ}=40mA, T_A=+25°C, On Fixture

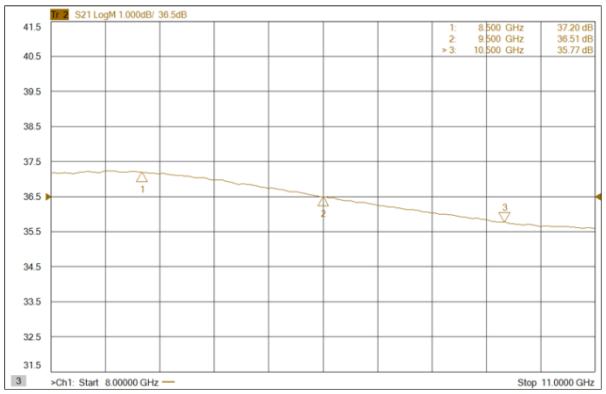
VSWRi



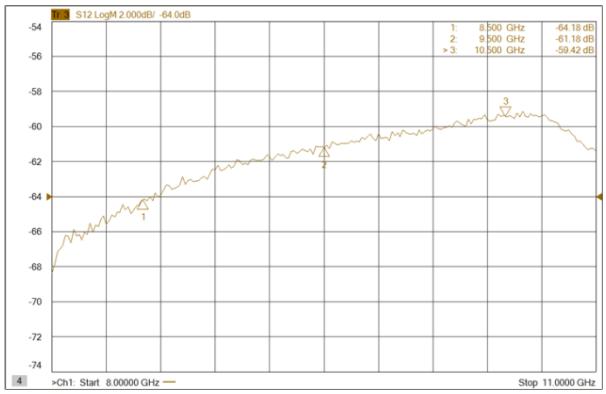
VSWRo



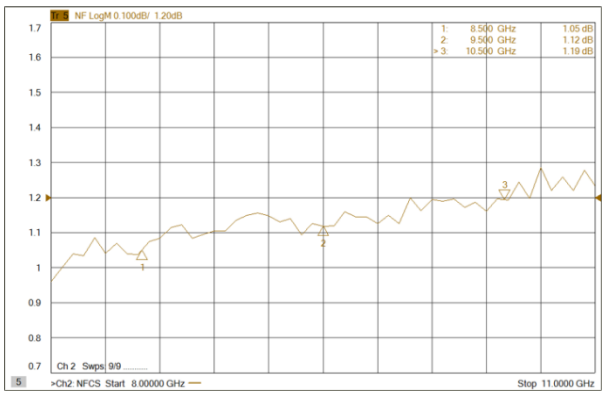
Gain

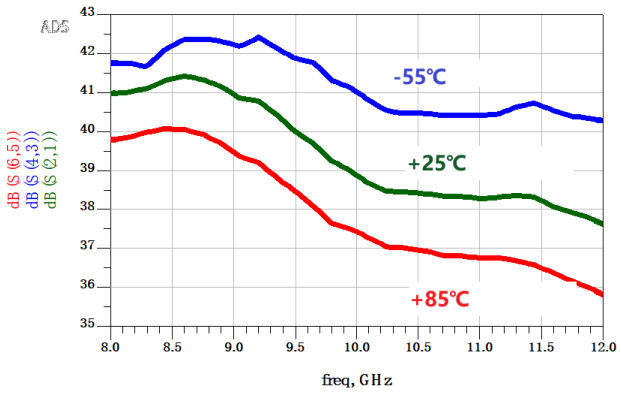


Isolation

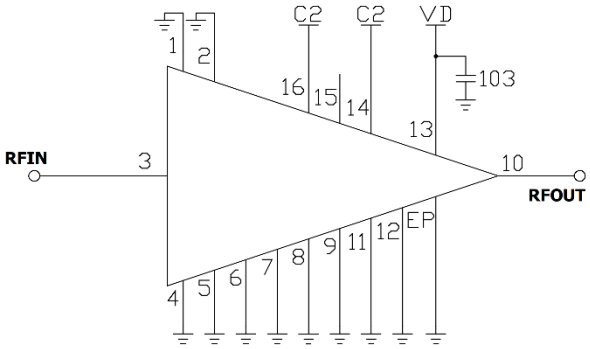


Noise Figure

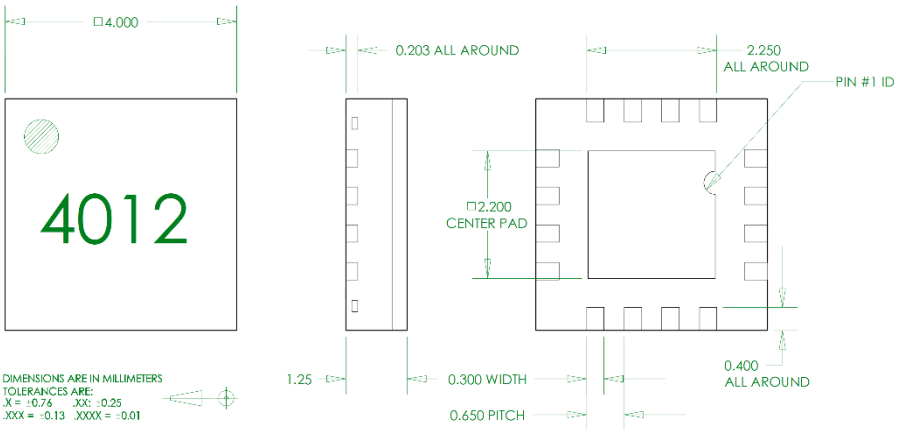




Application Circuit



Outline Drawing(mm)



Pin Descriptions

Pin No.	function	Pin No.	function
1	Connect to GND	11	Connect to GND
2	Connect to GND	12	Connect to GND
3	RFIN, AC Coupled	13	+VD
4	Connect to GND	14	C1*
5	Connect to GND	15	Connect to GND
6	Connect to GND	16	C2*
7	Connect to GND		
8	Connect to GND		
9	Connect to GND		
10	RFOUT, AC Coupled		

***When C1 and C2's voltage are equal to +VD, the amplifier is power on, C1 and C2 connect to GND, the amplifier is shutdown.**

Attention:

1. The moisture resistant grade of products is 2a, the storage environment ≤30°C/60% RH, and the surrounding workshop life is 4 weeks.
2. After un-packing, it is necessary to bake the parts for 6 hours in 125+/-5°environment before soldering.
3. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.
4. Ultrasonic cleaning is prohibited.
5. It is extremely not recommended to heat the package directly from the top.
6.The DC blocked capacitor of RFIN and RFOUT port withstand voltage is 20V.

Revision History

Revision	Date	Comment
1.0	May 29, 2023	First Release
1.1	Jul 23, 2023	Added “C1” and “C2” description for amplifier shutdown or power up
1.2	May 08, 2024	Added application circuit, updated maximum input power data, added port withstand voltage description
1.3	May 16, 2024	Updated Maximum Input Power
1.4	Jul 6, 2025	Added Marking information, Added Tolerance information
1.5	Aug 26, 2026	The curve illustrating the relationship between small signal gain and temperature variation has been added

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