

# SAC3074Q3

GaAs MMIC Low Noise Amplifier  
20~1000MHz

Rev 1.2

## Features

- Frequency: 20~1000MHz
- Gain: 29dB
- Noise Figure: 0.4dB typ. 0.6dB max.
- Single Power Supply:  
+5V/65mA +4V/40mA
- Output IP<sub>3</sub>: 37dBm@700MHz
- Integrated Gain vs. Temperature  
Compensation Circuit
- Package Size: 3mm×3mm×1.2(Typ.) mm

## Typical Applications

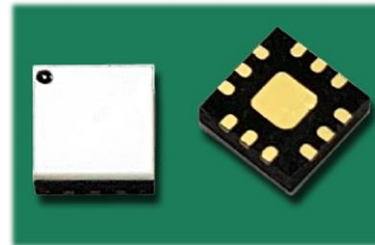
- Radar and ECM
- IF Low Noise Amplifier

## General Description

SAC3074Q3 is a GaAs MMIC Low Noise Amplifier chip, which operates between in 20~1000MHz. The amplifier can provide 29dB of gain, 20dBm of output P<sub>1dB</sub> and 0.4dB noise figure and from a +5V/65mA supply current.

SAC3074Q3 is assembled in a 3x3mm<sup>2</sup> RoHS-compliant low stress injection molded plastic QFN package.

## Picture



## Electrical Performance ( T<sub>A</sub>=25°C, V<sub>D</sub>= +5V, I<sub>D</sub>=65mA, Z<sub>0</sub>=50Ω )

Parameter	Min	Typ.	Max	Units
Frequency Range	20~1000			MHz
Gain	27	29	32	dB
Gain Flatness	—	±0.75	—	dB
Reverse Isolation	—	-30	—	dB
Input/Output VSWR	—	1.5	2.3	: 1
Noise Figure	—	0.4	0.6	dB
Output Power for 1 dB Compression (OP <sub>1dB</sub> )	19	20	—	dBm
Output Third Order Intercept (OIP <sub>3</sub> )	—	37*	—	dBm
OIP <sub>2</sub>	—	42	—	dBm
Supply Current (I <sub>D</sub> )	—	65	90	mA
Supply Voltage (V <sub>D</sub> )	4	—	5	V

\*Pout/Tone=9dBm Fc=700MHz, Δf=1MHz

## Absolute Maximum Ratings

Maximum Input Power	+20dBm, CW 1min, No damage	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V <sub>D</sub>	7V		

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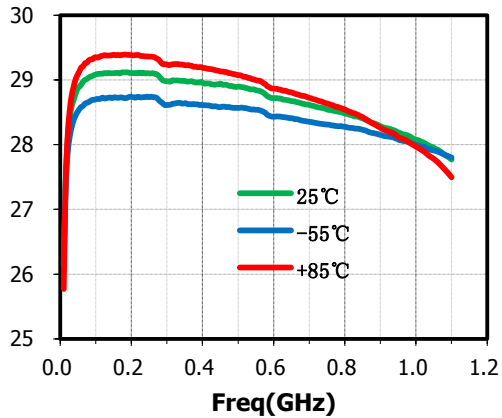
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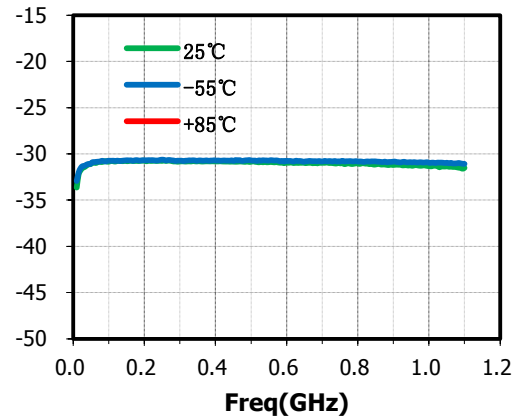
## Typical Performance Curve

VD=+5V, IDQ=65mA, Bias Choke: MMZ1608S202ATD25  
IDQ/SEL=Floating

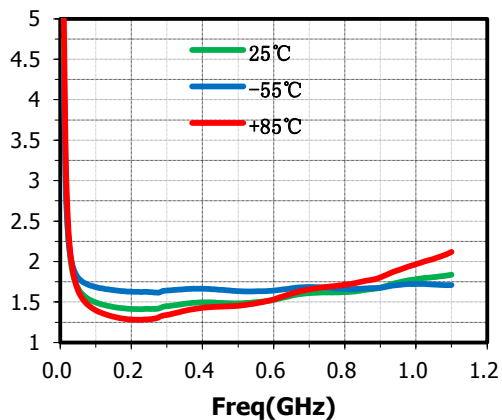
Small Signal Gain(dB) vs. Temperature



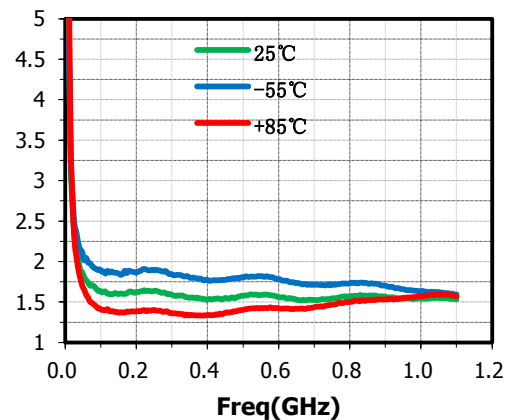
Reverse Isolation(dB) vs. Temperature



Input VSWR(:1) vs. Temperature



Output VSWR(:1) vs. Temperature



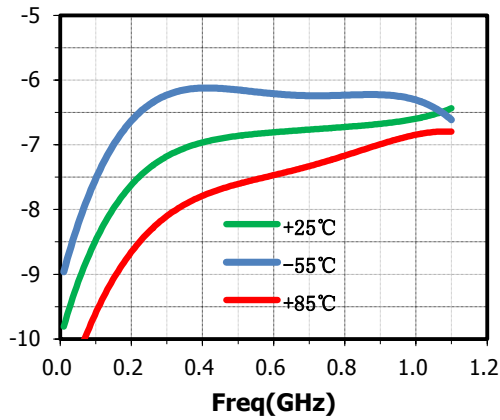
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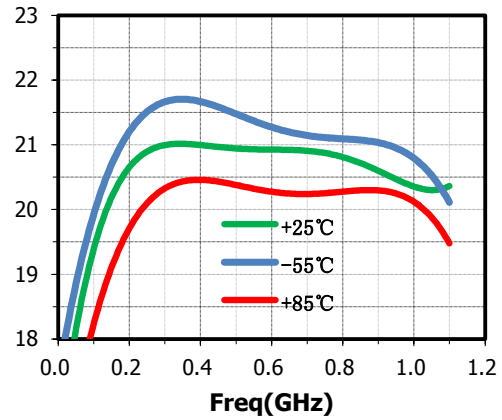
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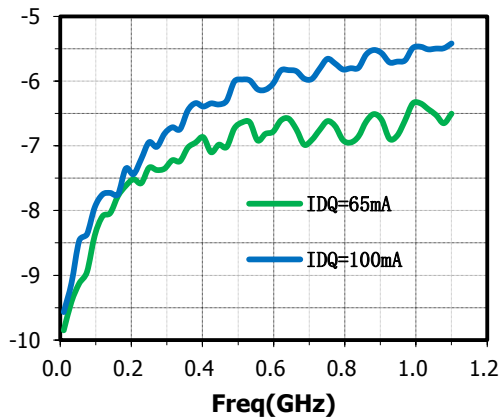
Input P<sub>1</sub>dB(dBm) vs. Temperature



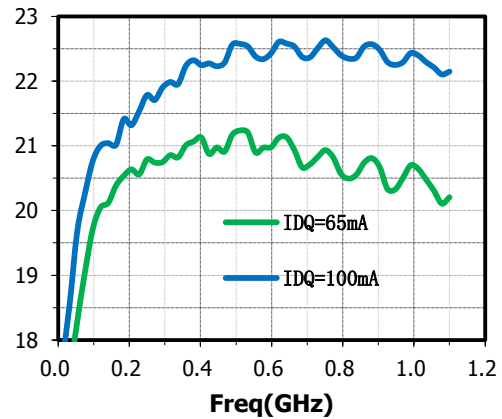
Output P<sub>1</sub>dB(dBm) vs. Temperature



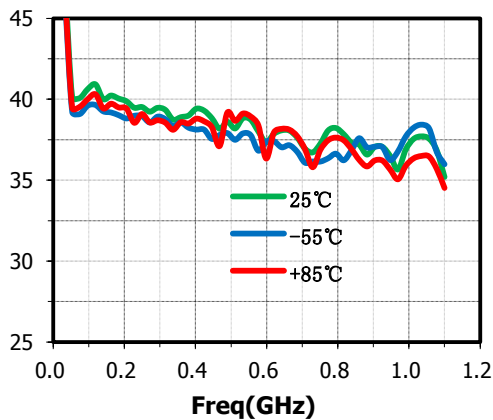
Input P<sub>1</sub>dB(dBm) vs.IDQ(mA)



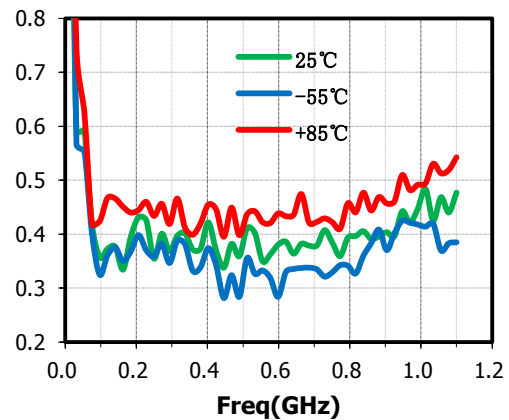
Output P<sub>1</sub>dB(dBm) vs.IDQ(mA)



OIP<sub>3</sub>(dBm) vs. Temperature



Noise Figure(dB) vs. Temperature



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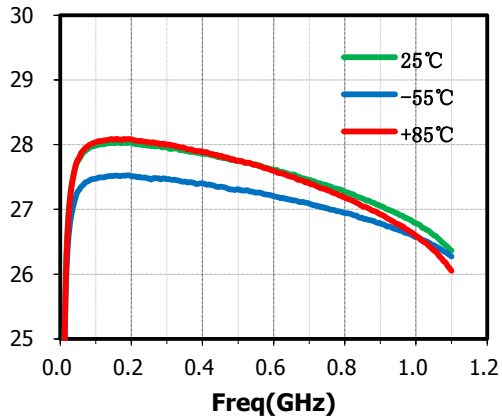


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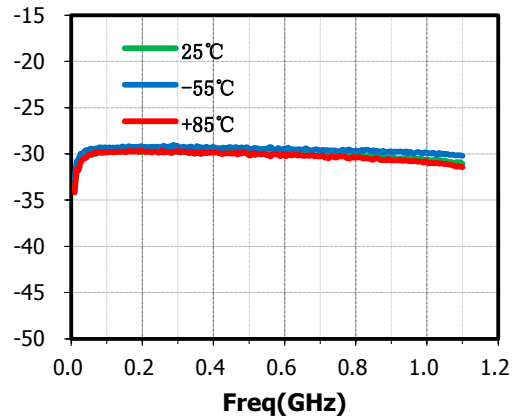
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VD=+4V, IDQ=40mA, Bias Choke: MMZ1608S202ATD25, IDQ/SEL=Connect to ground

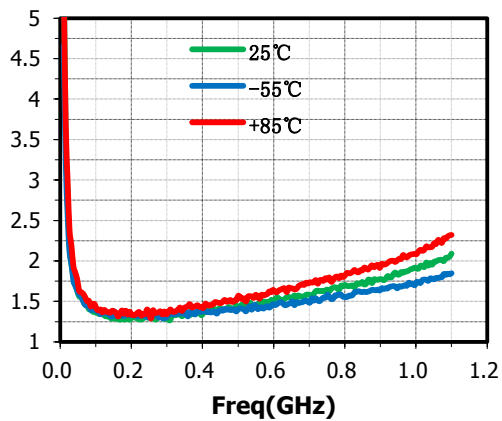
Small Signal Gain(dB) vs. Temperature



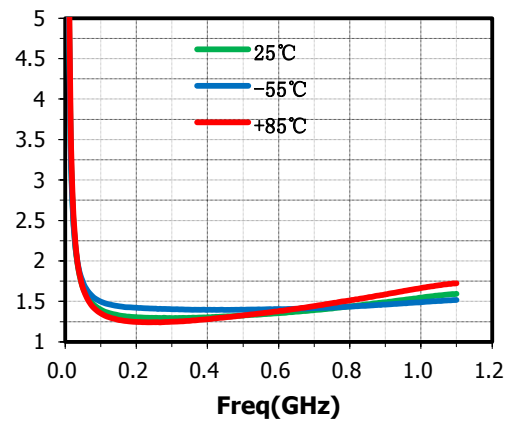
Reverse Isolation(dB) vs. Temperature



Input VSWR(:1) vs. Temperature



Output VSWR(:1) vs. Temperature

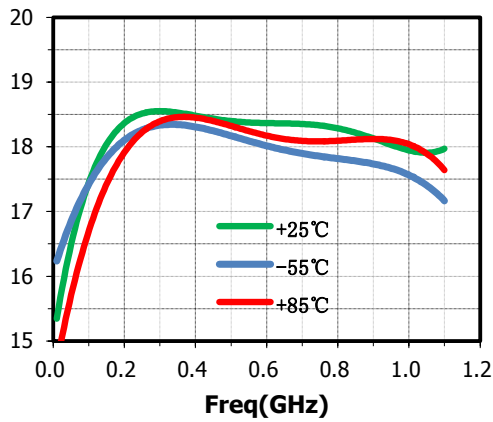


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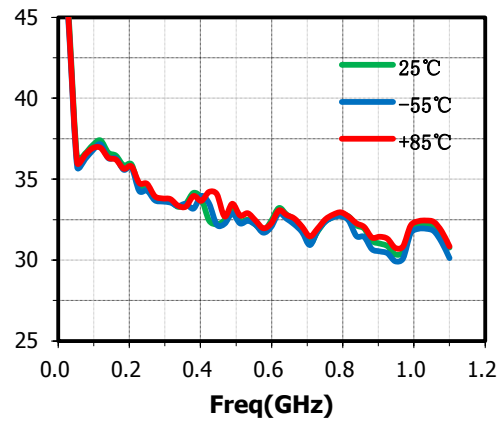
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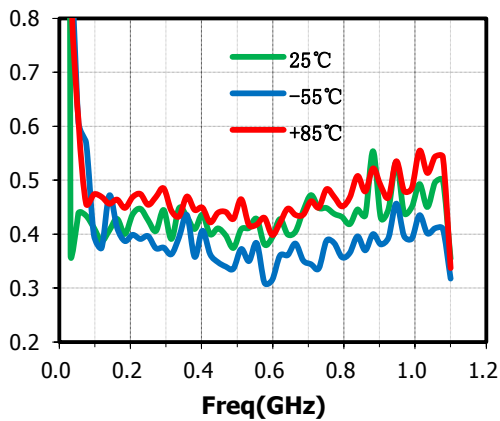
**OP<sub>1</sub>(dBm) vs. Temperature**



**OIP<sub>3</sub>(dBm) vs. Temperature**

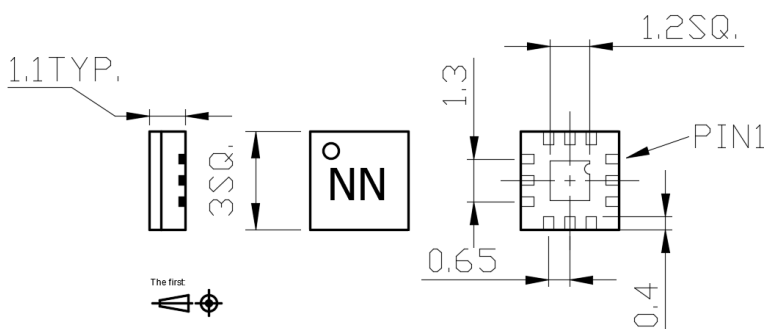


**Noise Figure(dB) vs. Temperature**



## Outline Drawing

(All dimensions in mm)

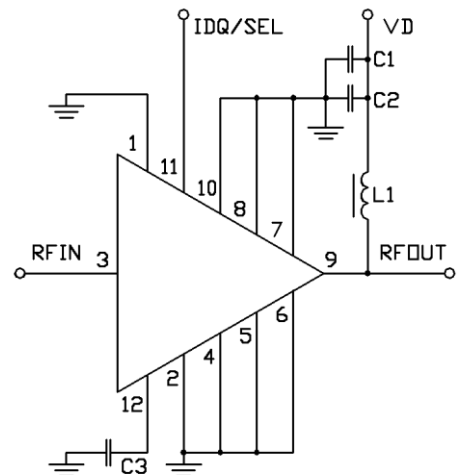


IDQ/SEL:

\*\* Connected to ground:  $I_{DQ}=65\text{mA}$ , Floating  $I_{DQ}=100\text{mA}@V_D=5\text{V}$

Connected to ground:  $I_{DQ}=40\text{mA}@V_D=4\text{V}$

## Assembly Diagram



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## Component list

Reference Des.	Value	Part Number	Manuf.	Size
C1	2.2 $\mu$ F	0603YD225KAT2A	Murata	0603
C2	1000pF	ANY	ANY	0603
L1	—	MMZ1608S202ATD25	TDK	0603

### Attention:

1. The moisture resistant grade of products is 2a, the storage environment  $\leq 30^{\circ}$  C/60% RH, the surrounding workshop life is 4 weeks;
2. After un-packing, it is necessary to bake the parts for 6 hours in 125+/-5 degree environment before soldering;
3. If a device is suspected of being inoperative due to a bad solder joint, it is first suggested that the circuit board and device be reflowed without removing the device. If a solder reflow does not fix the problem, then we recommend replacing the device, this can be done manually on a hot plate.