

# SAC3077Q3

GaAs MMIC Low Noise Amplifier  
0.05~6GHz

Rev 1.2

## Features

- Frequency: 0.05~6GHz
- Gain: 14dB@4GHz
- Noise Figure: 1.5dB typ. 2.0dB max.
- Single Power Supply: +4~5V/40~50mA
- OutputP<sub>-1dB</sub>: 14dBm@5GHz
- Package Size: 3mm×3mm×1.2mm

## Typical Applications

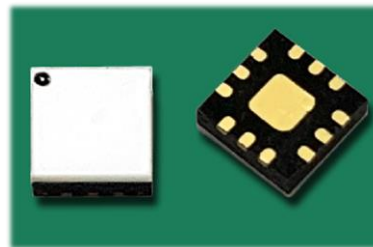
- Radar and ECM
- C band Low Noise Amplifier

## General Description

SAC3077Q3 is a GaAs MMIC Low Noise Amplifier assembled in a 3x3mm air cavity QFN package. The device operates between 0.05~6GHz.

The device can provide 14dB gain, 14dBm OutputP<sub>-1dB</sub>, 1.5dB noise figure, while requiring 50 mA from a +5V supply.

## Picture



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

Parameter	Min	Typ.	Max	Units
Frequency Range	0.05~6			GHz
Gain	10	14	20	dB
Gain Flatness	—	±4	—	dB
Reverse Isolation	—	-20	—	dB
Input/Output VSWR	—	1.5	2.0	:1
Noise Figure	—	1.5	1.7	dB
Output Power for 1 dB Compression (OP <sub>-1dB</sub> )	12	14	—	dBm
Output Third Order Intercept (OIP <sub>3</sub> )	—	29*	—	dBm
Supply Current(I <sub>D</sub> )	—	50	70	mA
Supply Voltage(V <sub>D</sub> )	4	—	5	V

\*Pout/Tone=5dBm Fc=4GHz, Δf=1MHz

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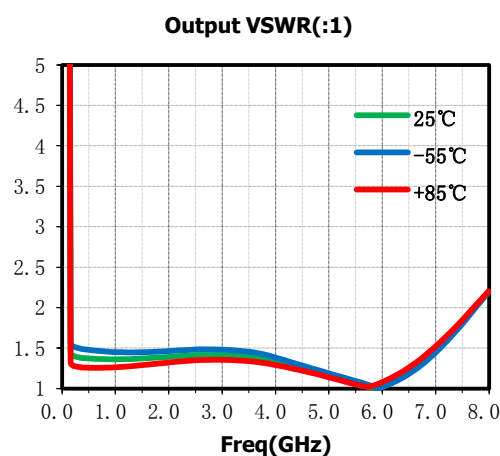
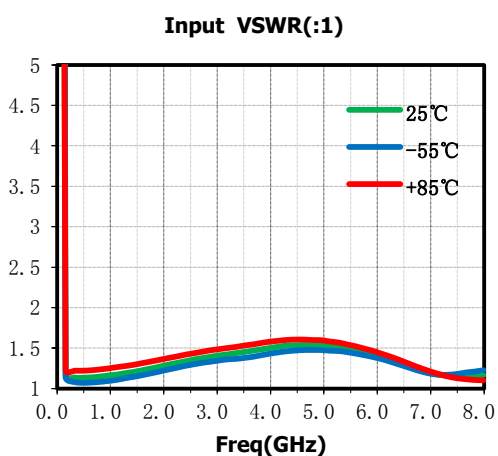
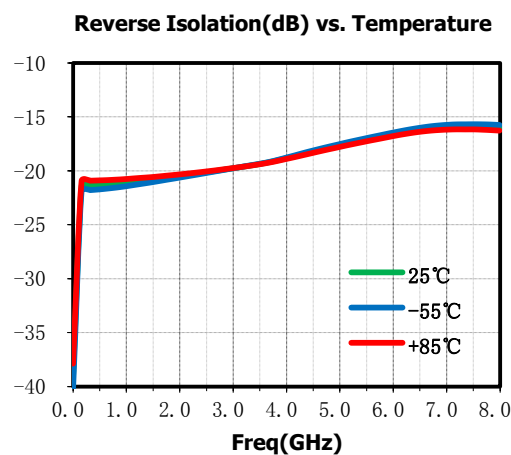
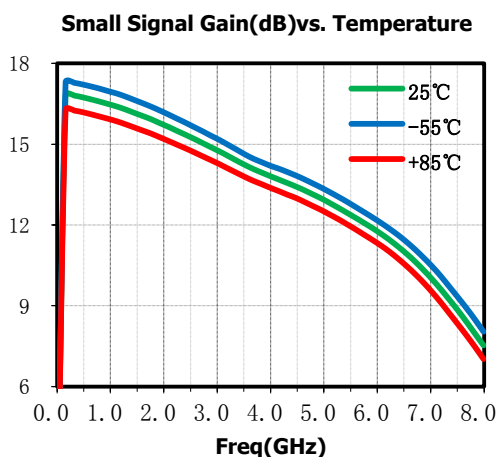
Rev 1.2

## Absolute Maximum Ratings

Maximum Input Power	+13dBm , CW 1min	Operating Temperature	-55°C ~ +85°C
Channel Temperature	150°C	Storage Temperature	-65°C ~ +150°C
Maximum $V_D$	+6V		

## Typical Performance Curve

$V_D=+4V$ ,  $I_{DQ}=40mA$



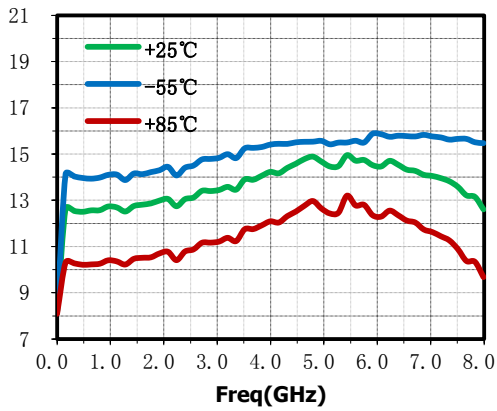
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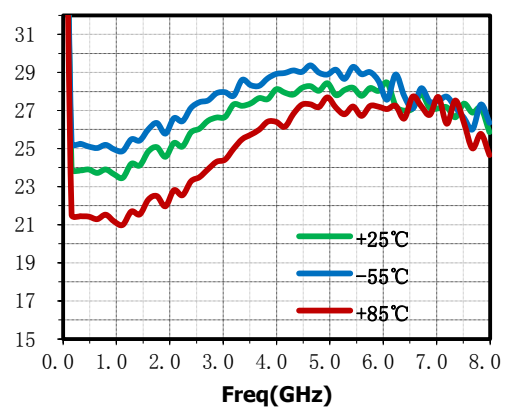
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Rev 1.2

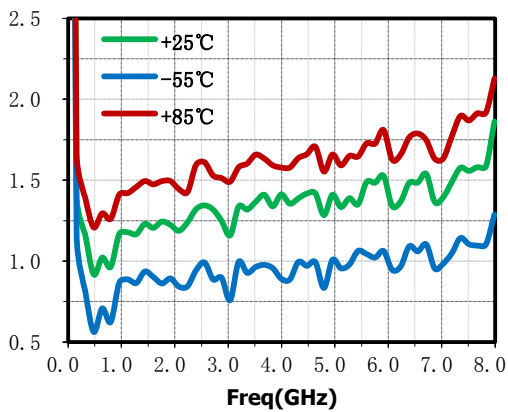
**OP<sub>1</sub>(dBm) vs. Temperature**



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

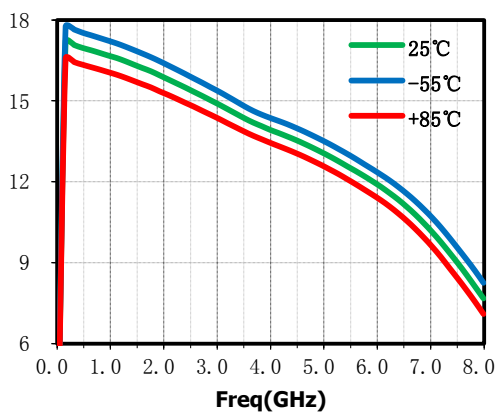


**Noise Figure(dB) vs. Temperature**

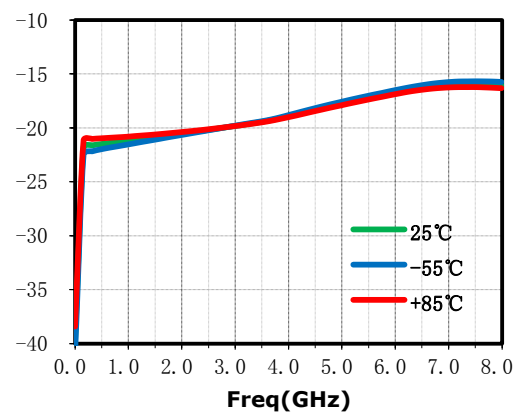


VD=+5V, IDQ=50mA

**Small Signal Gain(dB) vs. Temperature**



**Reverse Isolation(dB) vs. Temperature**



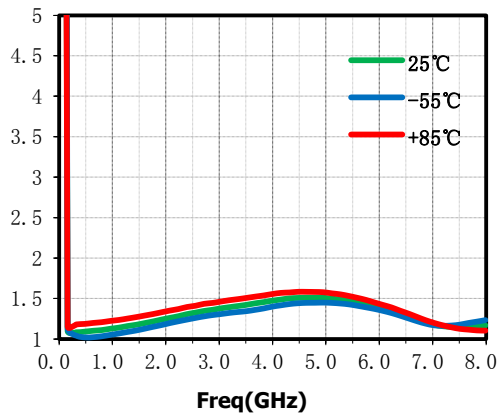
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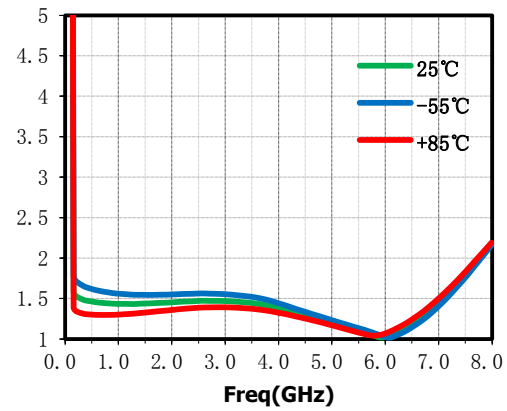
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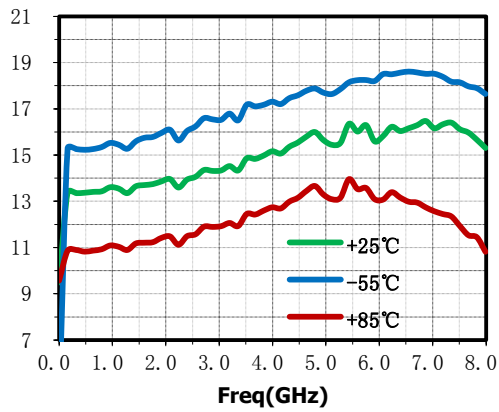
Input VSWR(:1) vs. Temperature



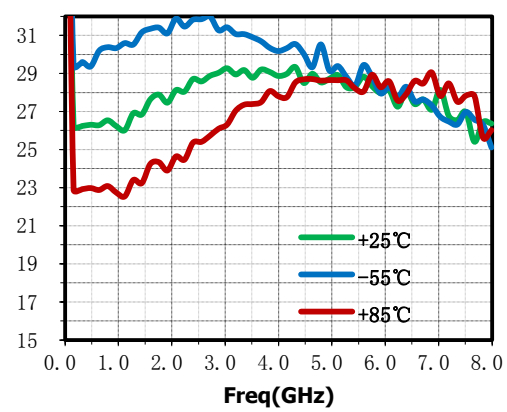
Output VSWR(:1) vs. Temperature



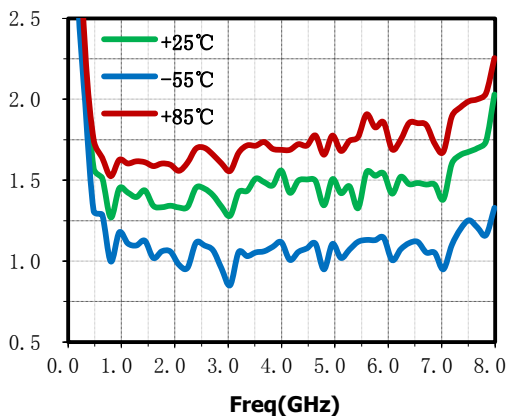
OP<sub>1</sub>(dBm) vs. Temperature



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



Noise Figure(dB) vs. Temperature



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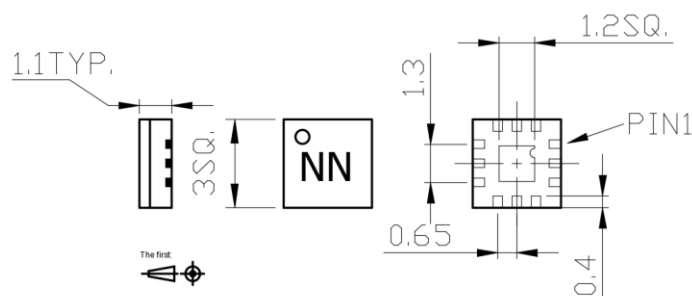
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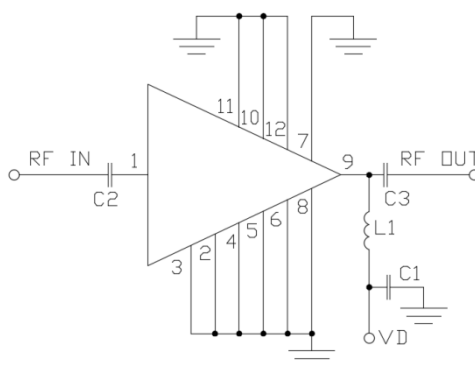
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## Outline Drawing

(All dimensions in mm)



## Assembly Diagram



## Component list

Reference Des.	Value	Part Number	Manuf.	Size
C1	2.2 $\mu$ F	—	ANY	0402
C2, C3	470pF	—	ANY	0402
L1	—	MMZ1005A222	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. NO heat gun.
4. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.
5. Unintegrated DC-isolation capacitors at input and output ports of radio frequency.