

# SAC3081Q3

GaAs MMIC Low Noise Amplifier  
0.02~8GHz

Rev 1.2

## Features

- Frequency: 0.02~8GHz
- Gain: 24dB
- Noise Figure: 1.3dB Typ. 1.8dB Max
- Output P<sub>1dB</sub>: 13dBm
- Power Supply: +5V@55mA
- Package Size: 3mmx3mmx1.1mm

## Typical Applications

- Wide Band Receiver
- High Density MCM
- SDR

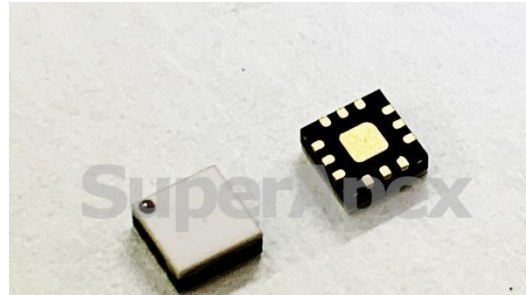
## General Description

SAC3081Q3 is a GaAs MMIC Low Noise Amplifier in QFN surface mount package, which operates between in 0.02~8GHz.

The amplifier can provide 24dB of gain, 13dBm of Output P<sub>1dB</sub> and 1.3dB noise figure and from a 55mA supply current.

SAC3081Q3 is assembled in a 3mm x 3mm QFN plastic package.

## Picture



## Electrical Performance ( T<sub>A</sub>=25°C, V<sub>D</sub>=+5V, I<sub>D</sub>=55mA, Z<sub>0</sub>=50Ω )

Parameter	Min.	Typ.	Max.	Units
Frequency Range	0.02~8			GHz
Gain	22	24	29	dB
Gain Flatness	—	±1	±1.75	dB
Input VSWR/ Output VSWR	—	1.5	2.5	:1
Noise Figure	—	1.3	1.8	dB
Reverse Isolation	—	-30	—	dB
Output P <sub>1dB</sub>	12	13	—	dBm
Output IP <sub>3</sub>	—	25	—	dBm
Supply Current(I <sub>D</sub> )	—	55	65	mA

## Absolute Maximum Ratings

Maximum Input Power	+12dBm,CW 30s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
Supply Voltage	+5.5V		

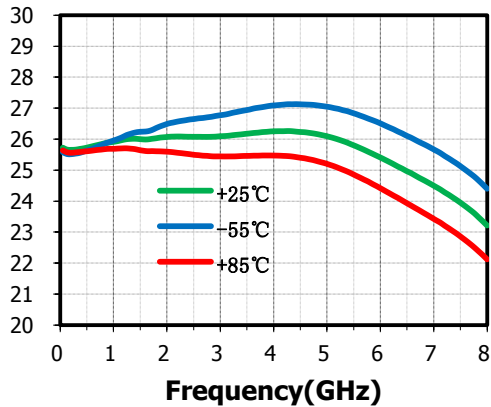
## SuperApex, LLC

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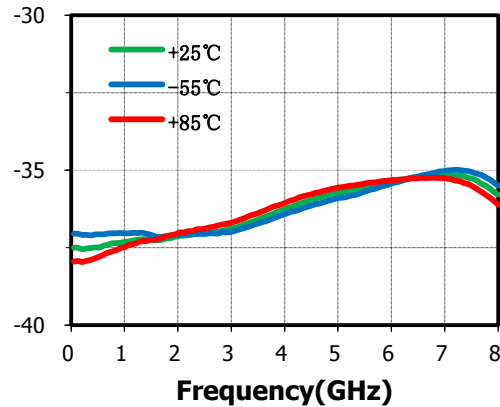
## Typical Performance Curve

$V_D=+5V, I_{DQ}=55mA$ , The following curves are taken from SAC3081Q3 evaluation board. No De-embedding operation has been Implemented.

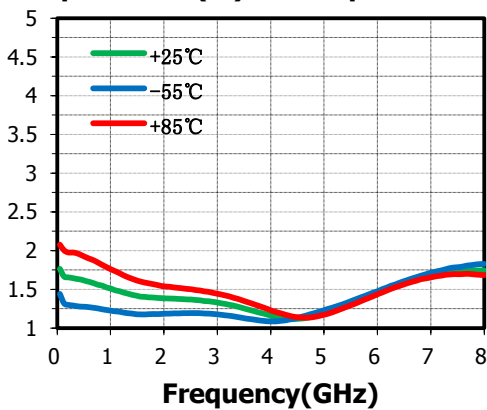
**Small Signal Gain(dB) vs.Temperature**



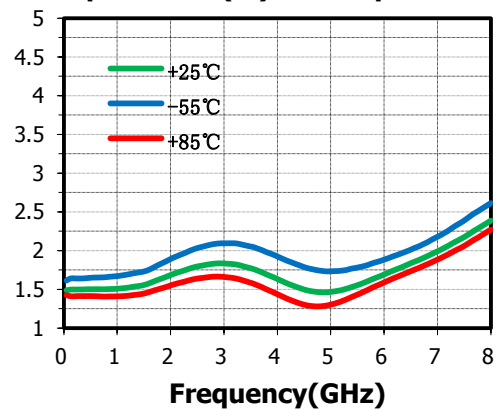
**Reverse Isolation(dB) vs.Temperature**



**Input VSWR(:1) vs.Temperature**



**Output VSWR(:1) vs.Temperature**



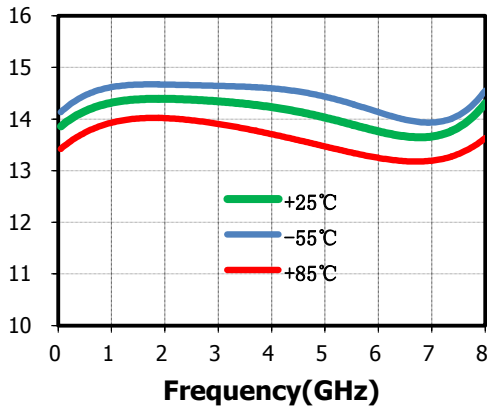
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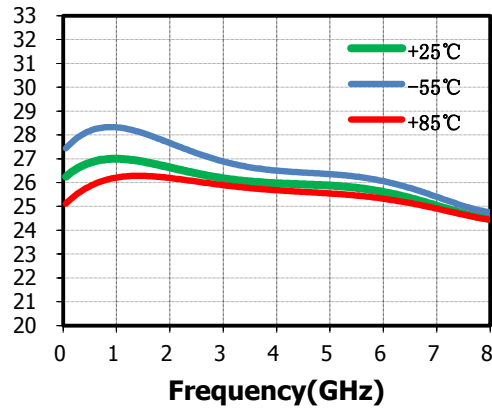
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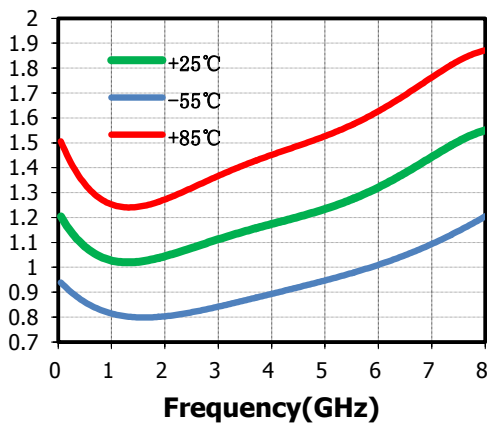
**Output P-1dB(dBm) vs.Temperature**



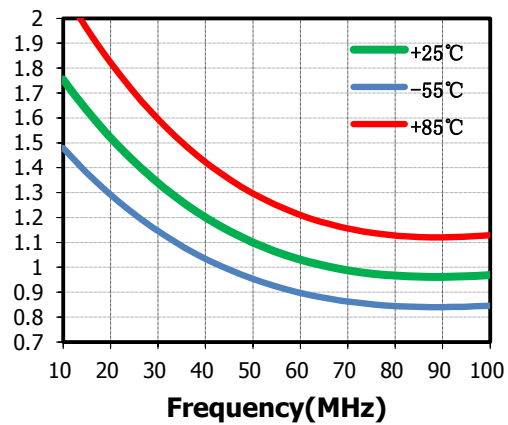
**Output IP<sub>3</sub>(dBm) vs.Temperature**



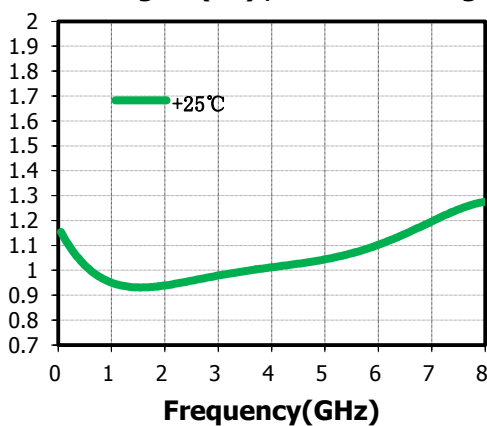
**Noise Figure(dB) vs.Temperature**



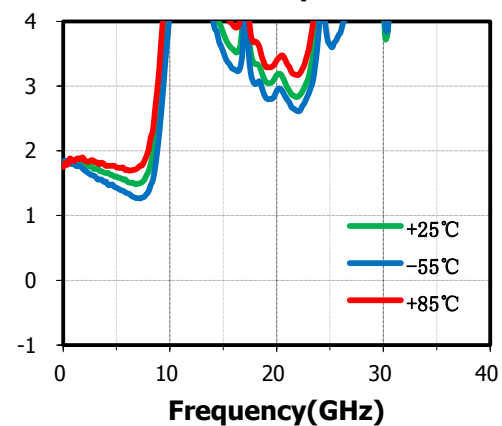
**Noise Figure(dB) vs.Temperature**



**Noise Figure(dB) , De-embedding**



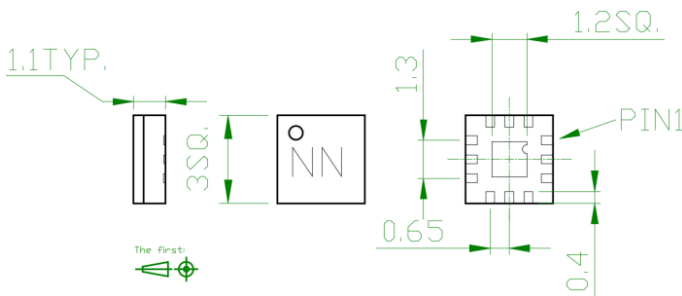
**K factor vs.Temperature**



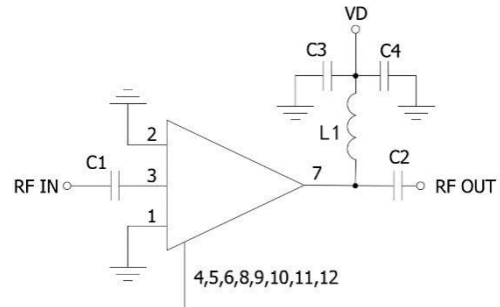
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## Outline Drawing (All dimensions in mm)



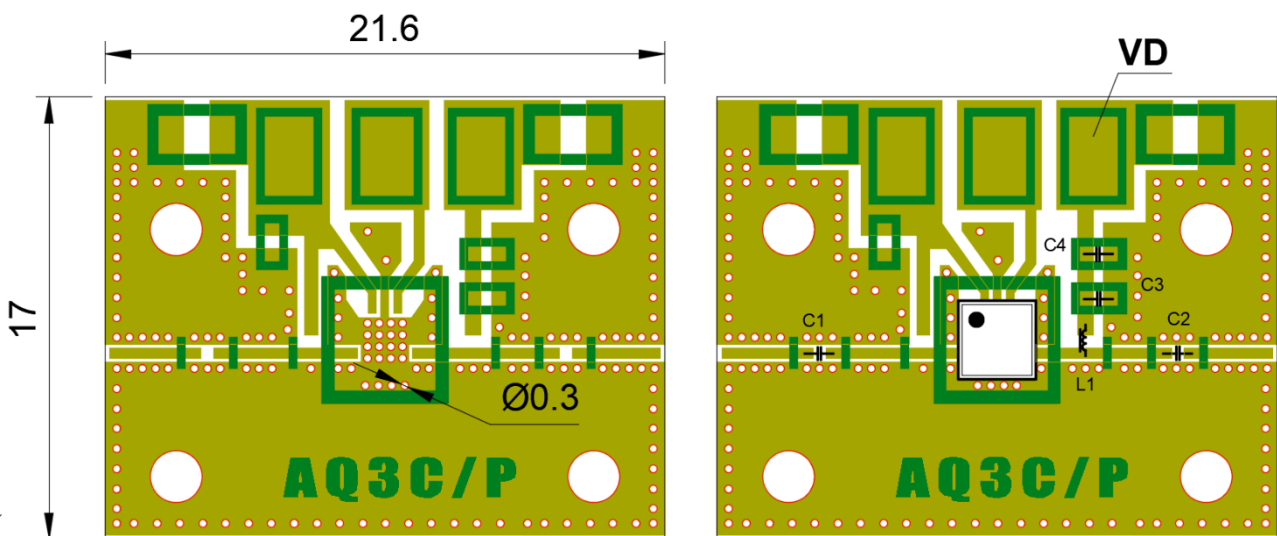
## Application Circuit



## Pin Function

Pin No.	Description	Pin No.	Description
1	Connect to ground	7	RF output/DC, DC Coupled
2	Connect to ground	8	Connect to ground
3	RF input, DC Coupled	9	Connect to ground
4	Connect to ground	10	NC or Connect to ground
5	Connect to ground	11	NC or Connect to ground
6	Connect to ground	12	NC or Connect to ground

## SAC3081Q3 Evaluation Board



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The Evaluation board is a 2-layer board fabricated using Rogers 4350 t=0.254 and using best practices for high frequency RF design. The RF input and RF output traces have a 50  $\Omega$  characteristic impedance.

## Components List

Reference Des.	Value	Part Number	Manuf.
C1、 C2、 C3	300pF	GRM1555C1H301JA	Murata
C4	1uF	GRM0336R61A105KE	Murata
L1	-	MMZ1005A222	TDK

### 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. There is an additional resistor, inductor, and capacitor (RLC) shunt network that aids unconditional stability.

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