

SAC3081QP3

GaAs MMIC Low Noise Amplifier
0.02~8GHz

Rev 1.0

Features

- Frequency: 0.02~8GHz
- Gain: 24dB
- Noise Figure: 1.3dB Typ. 1.8dB Max
- Output P_{1dB}: 13dBm
- Power Supply: +5V@55mA
- Package Size: 3mmx3mmx0.75mm

Typical Applications

- Wide Band Receiver
- High Density MCM
- SDR

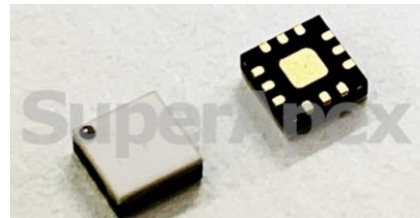
General Description

SAC3081QP3 is a GaAs MMIC Low Noise Amplifier in QFN over molding surface mount package, which operates between in 0.02~8GHz.

The amplifier can provide 24dB of gain, 13dBm of Output P_{1dB} and 1.3dB noise figure and from a 55mA supply current.

SAC3081QP3 is assembled in a 3x3mm² QFN plastic package.

Picture



Electrical Performance (T_A=25°C, V_D=+5V, I_D=55mA, Z₀=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 _{1dB}	12	13	—	dBm
Output IP ₃	—	25	—	dBm
Supply Current(I _D)	—	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		

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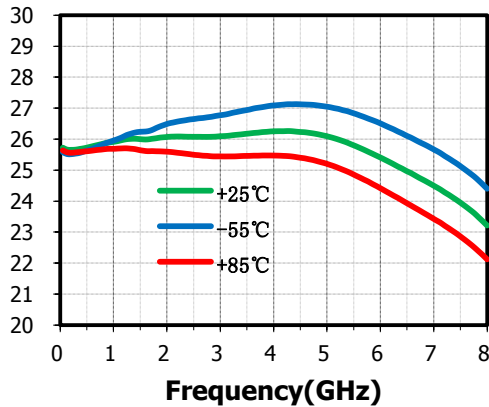
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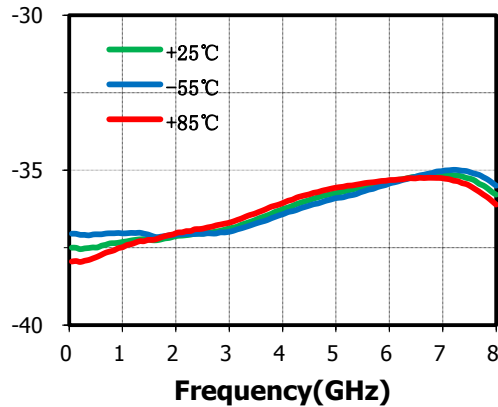
Typical Performance Curve

$V_D=+5V, I_{DQ}=55mA$, The following curves are taken from SAC3081QP3 evaluation board. No De-embedding operation has been Implemented.

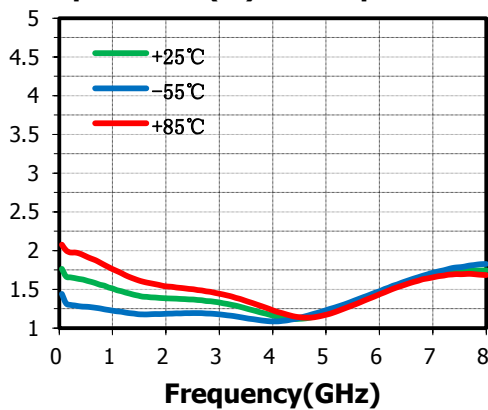
Small Signal Gain(dB) vs.Temperature



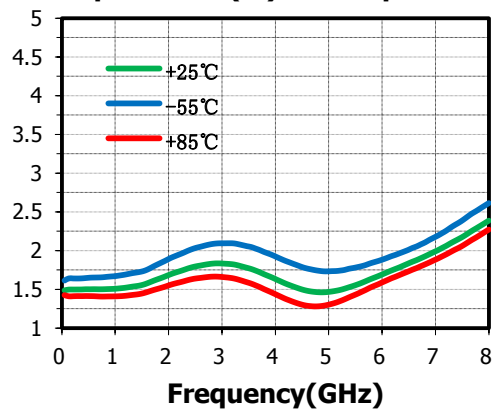
Reverse Isolation(dB) vs.Temperature



Input VSWR(:1) vs.Temperature



Output VSWR(:1) vs.Temperature



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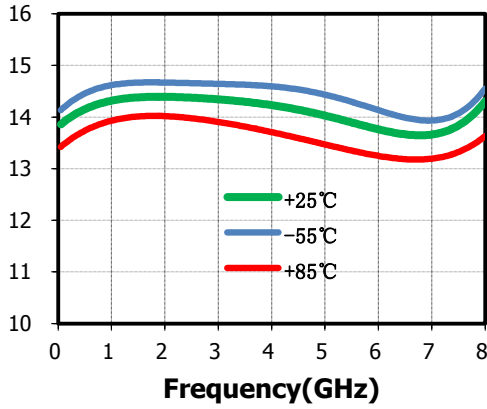
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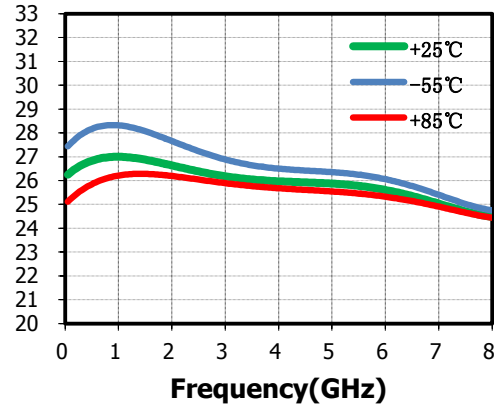
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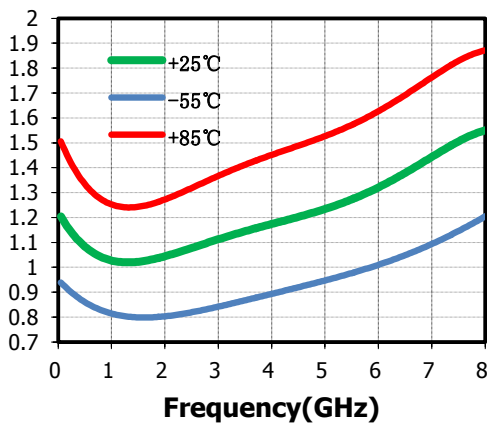
Output P-1dB(dBm) vs.Temperature



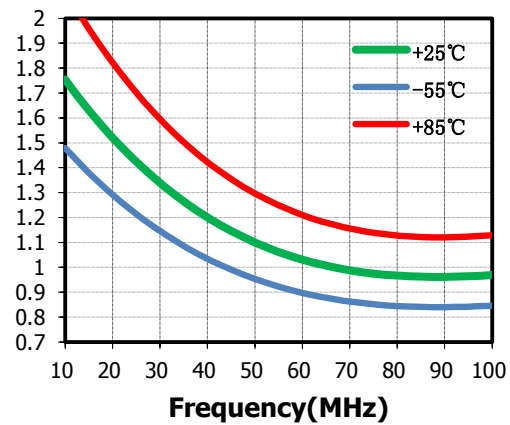
Output IP₃(dBm) vs.Temperature



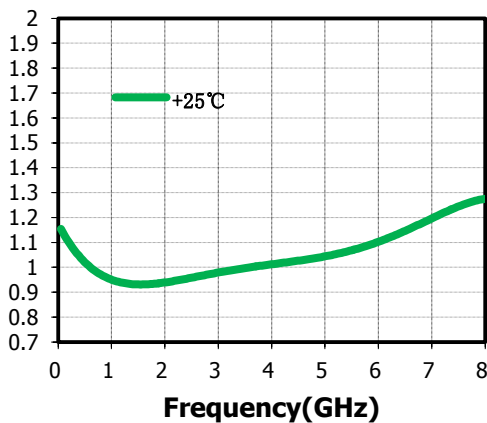
Noise Figure(dB) vs.Temperature



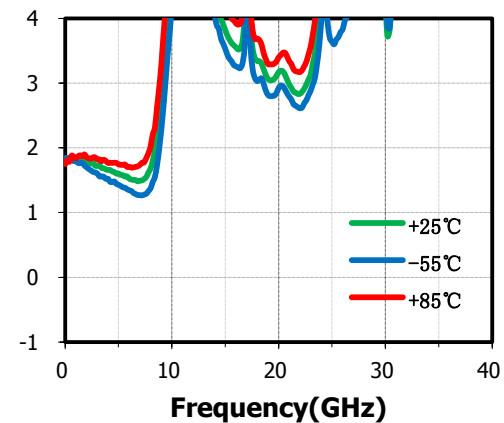
Noise Figure(dB) vs.Temperature



Noise Figure(dB) , De-embedding



K factor vs.Temperature



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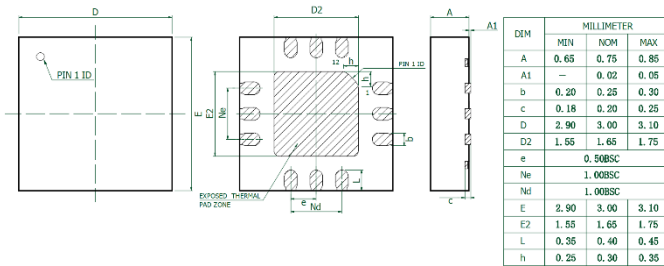
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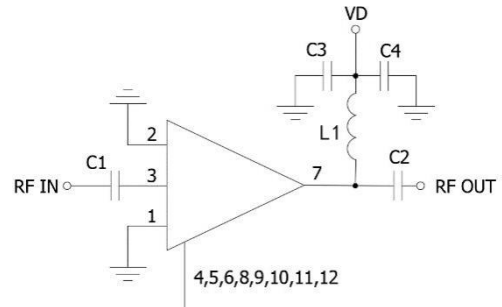
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Outline Drawing (All dimensions in mm)



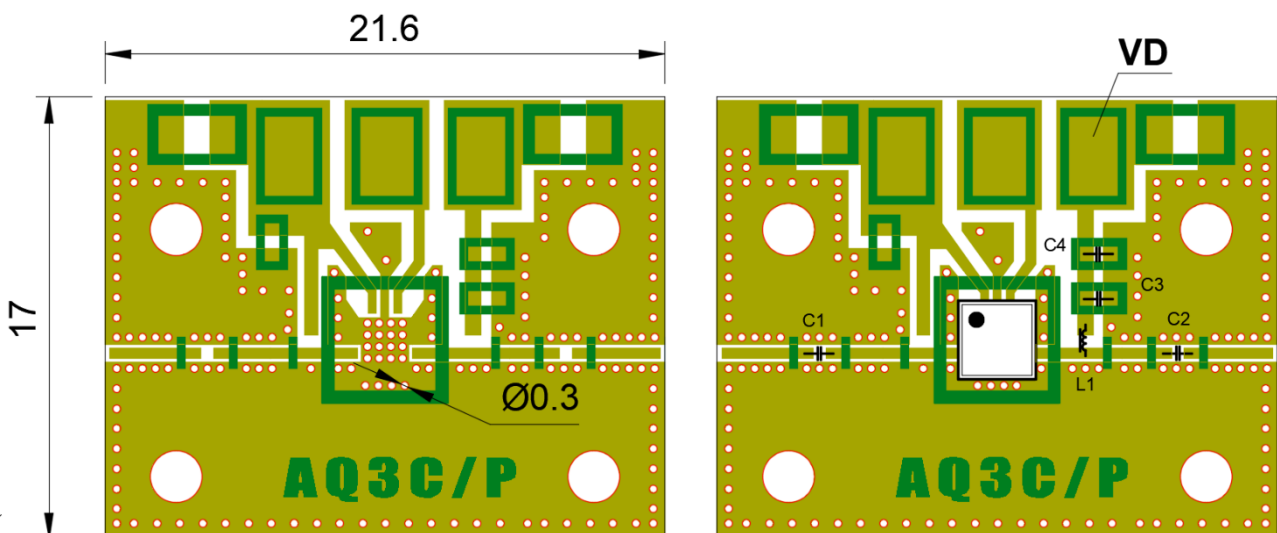
Application Circuit



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

SAC3081QP3 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 Ω 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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