

SAC3087QP3

GaAs MMIC Low Noise Amplifier
0.03~3GHz

Rev 1.0

Features

- Frequency: 0.03~3GHz
- Gain: 24dB
- Noise Figure: 0.9dB Typ. 1.4dB Max.
- Output P_{-1dB}: 19dBm
- Output IP₃: 36dBm@1GHz
- Power Supply: +5V@80mA
- Size: 3mmx3mmx1.1mm

Typical Applications

- Radar and ECM
- RF/ Microwave Radio
- Military and Space
- Test and Measurement

General Description

SAC3087QP3 is a GaAs MMIC low noise amplifier die which operates between in 0.03~3GHz. The amplifier can provide 24dB gain, 19dBm Output P_{-1dB} and 0.9dB noise figure from a 80mA supply current.

SAC3087QP3 is assembled in a 3mm x 3mm QFN plastic package.

Picture



Electrical Performance (T_A=25°C, V_D=+5V, I_D=80mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	0.03~3			GHz
Gain	20	24	26	dB
Gain Flatness	—	±1	±1.5	dB
Input VSWR/Output VSWR	—	1.5	2.5	:1
Noise Figure	—	0.9	1.4	dB
Reverse Isolation	—	-28	—	dB
Output P _{-1dB}	17	19	—	dBm
Output IP ₃	—	36*	—	dBm
Supply Current(I _D)	—	80	100	mA

* Pin/Tone=-15dBm fc=1GHz, Δf=4MHz

Absolute Maximum Ratings

Maximum Input Power	+15dBm,CW 30s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-65°C~+150°C
Supply Voltage	+8V		

SuperApex, LLC

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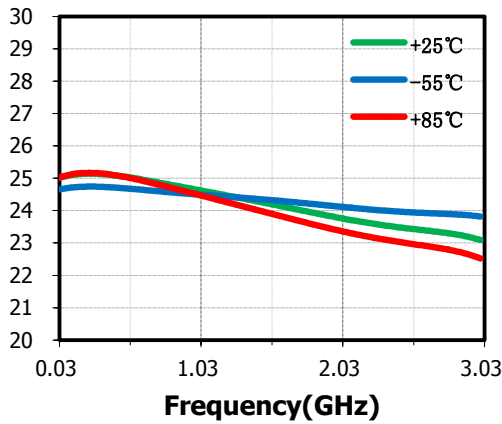
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Typical Performance Curve

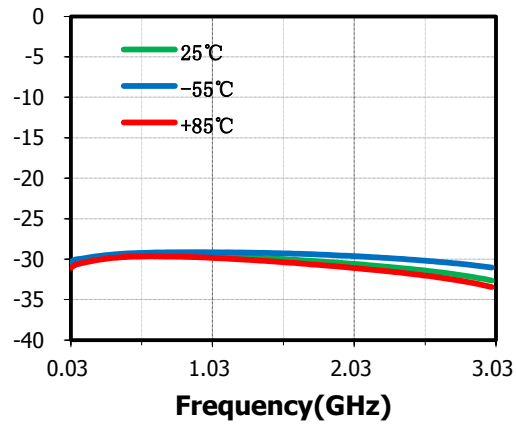
$V_D=+5V$, $I_{DQ}=80mA$,

The following curves are taken from SAC3087QP3 evaluation board. No De-embedding operation has been Implemented.

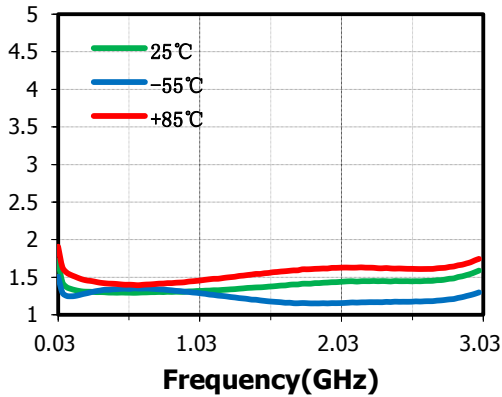
Small Signal Gain(dB) vs.Temperature



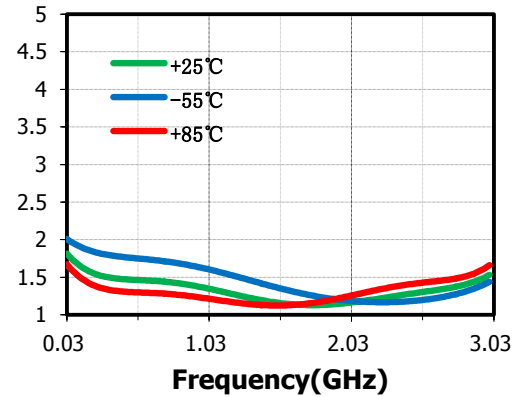
Reverse Isolation(dB) vs.Temperature



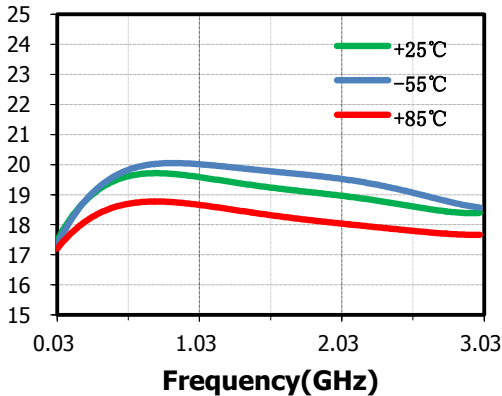
Input VSWR(:1) vs.Temperature



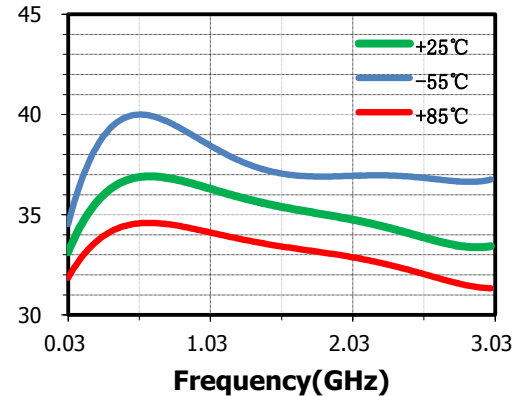
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Output IP3(dBm) vs.Temperature



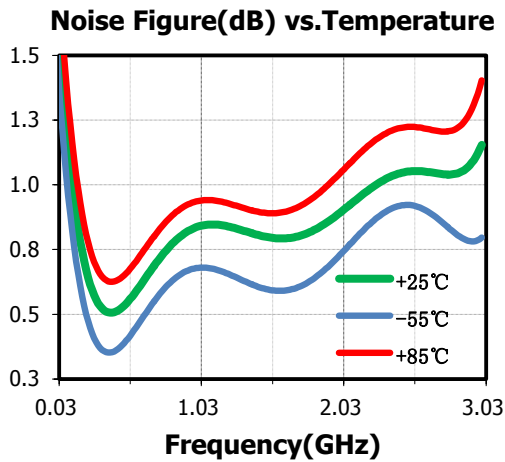
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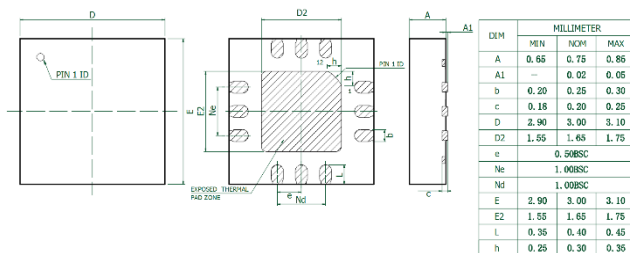
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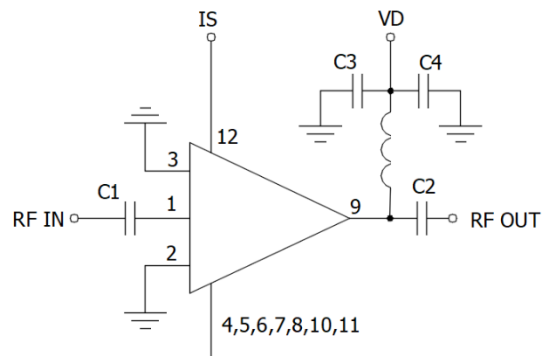
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**Outline Drawing
(All dimensions in mm)**



Application Circuit



Pin Function

Pin No.	Description	Pin No.	Description
1	RF input, DC Coupled	7	Connect to ground
2	Connect to ground	8	Connect to ground
3	Connect to ground	9	RF output, DC Coupled/Bias
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	I_{DQ} Adj.*

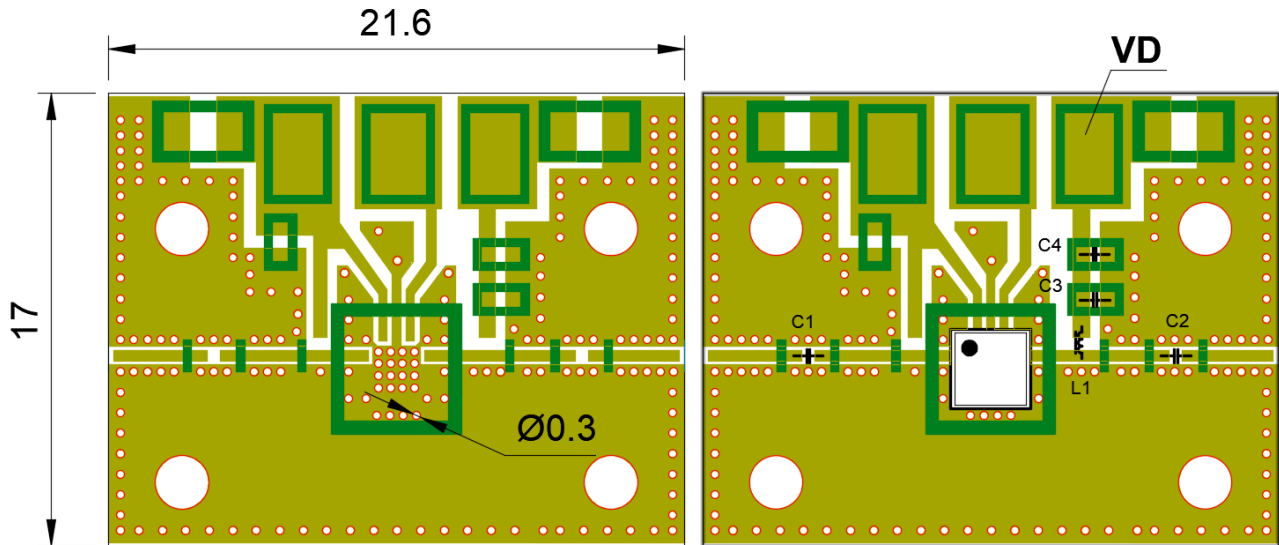
* IS=Floating, I_{DQ} =80mA
IS=GND, I_{DQ} =55mA

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SAC3087QP3 Evaluation Board



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	-	BLM15HG102SN	Murata

Attention:

1. The moisture resistant grade of products is 2a, the storage environment $\leq 30^\circ\text{C}/60\%\text{RH}$, 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.

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