SAC3087Q3

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_{-1}dB：19dBm
- Output IP_3：36dBm@1GHz
- Power Supply: +5V@80mA
- Size：3mmx3mmx1.1mm

Typical Applications

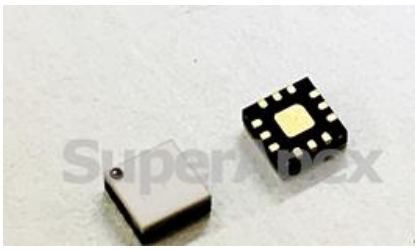
- Radar and ECM
- RF/ Microwave Radio
- Military and Space
- Test and Measurement

General Description

SAC3087Q3 is a GaAs MMIC low noise amplifier die which operates between in 0.03~3GHz. The amplifier can provide 24dB gain, 19dBm Output P_{-1}dB and 0.9dB noise figure from a 80mA supply current.

SAC3087Q3 is assembled in a 3mm x 3mm QFN plastic package.

Picture



Electrical Performance (T_A=25℃, V_D=+5V, I_D=80mA, Z_0=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_{-1}dB	17	19	—	dBm
Output IP_3	—	36*	—	dBm
Supply Current(I_D)	—	80	100	mA

* Pin/Tone=-15dBm fc=1GHz，△f=4MHz

Absolute Maximum Ratings

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

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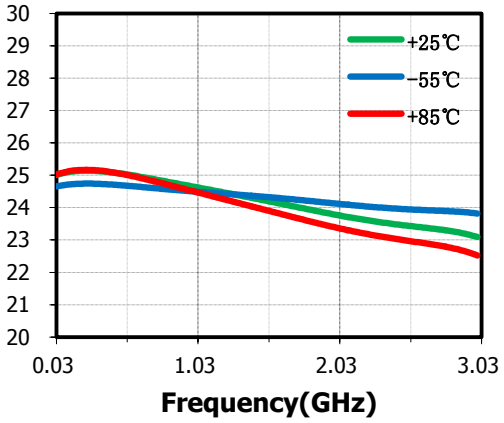
Typical Performance Curve

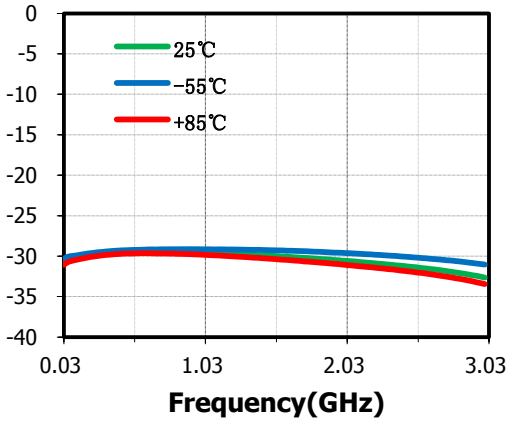
V_D=+5V， I_{DQ}=80mA,

The following curves are taken from SAC3087Q3 evaluation board. No De-embedding operation has been Implemented.

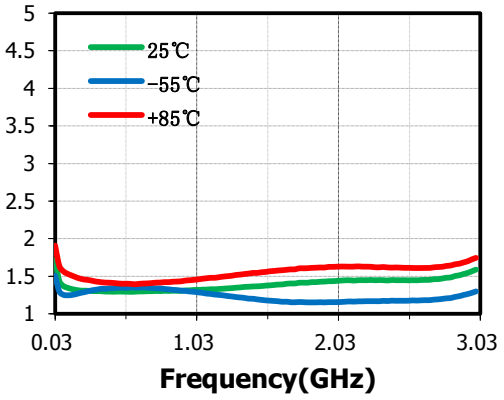
Small Signal Gain(dB) vs.Temperature



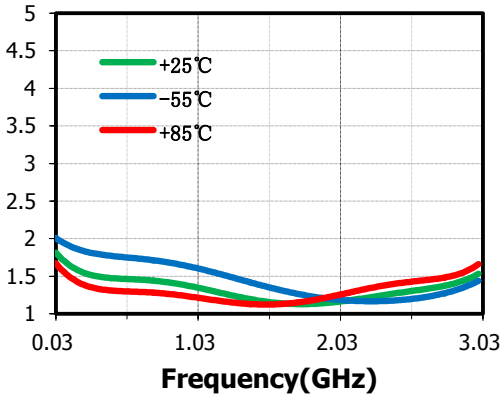
Reverse Isolation(dB) vs.Temperature



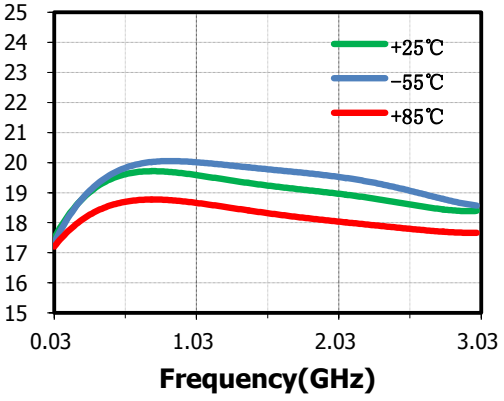
Input VSWR(:1) vs.Temperature



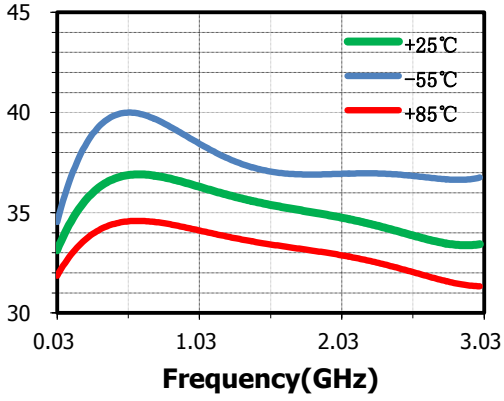
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Output IP3(dBm) vs.Temperature



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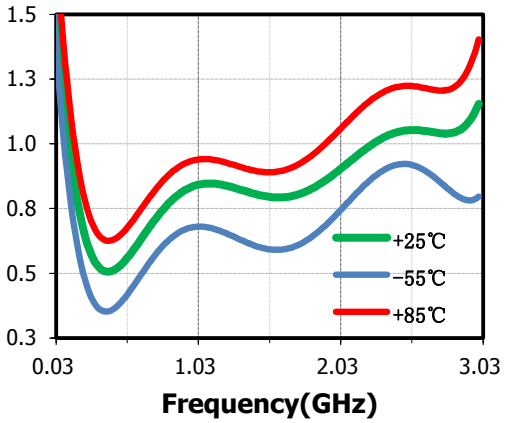
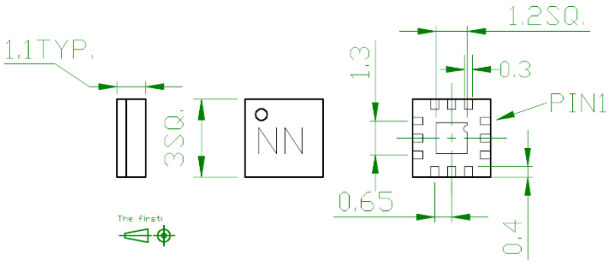
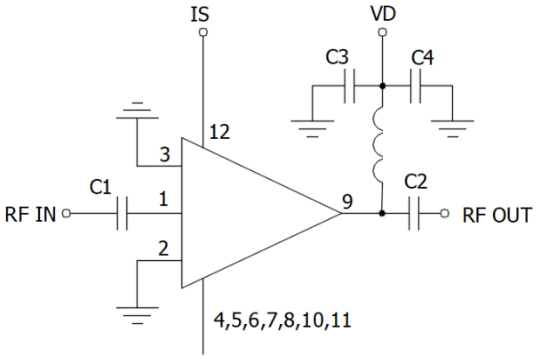
Noise Figure(dB) vs.Temperature



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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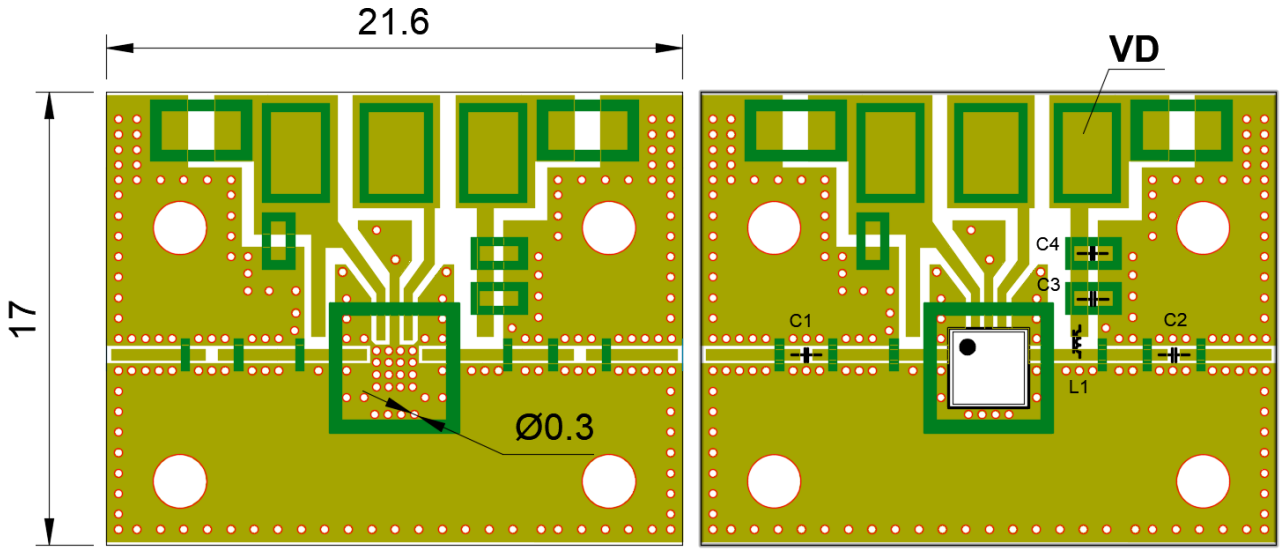
SAC3087Q3 Evaluation Board



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 Ω 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 ≤30° 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.