

SAC3088Q3

GaAs MMIC Low Noise Amplifier
12~20GHz

Rev 1.0

Features

- Frequency: 12~20GHz
- Gain: 18dB
- Noise Figure: 1.3dB Typ. 1.5dB Max.
- Output P_{1dB}: 7dBm
- Power Supply: +5V@15mA
- Package Size: 3mmx3mmx1.1mm

Typical Applications

- Point-to-Point Radios
- Ku band Radar

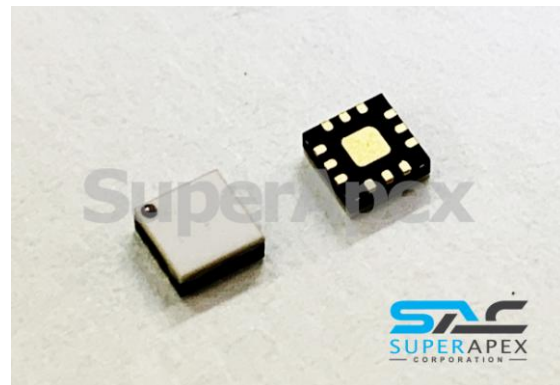
General Description

SAC3088Q3 is a GaAs MMIC Low Noise Amplifier in QFN surface mount package, which operates between in 12~20GHz.

The amplifier can provide 18dB of gain, 7dBm of output P_{1dB} and 1.3dB noise figure and from a 15mA supply current.

SAC3088Q3 is assembled in a 3mm x 3mm QFN plastic package.

Picture



Electrical Performance (T_A=25°C, V_D=+5V, I_D=15mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	12~20			GHz
Gain	15	18	22	dB
Gain Flatness	—	±1	±1.75	dB
Input VSWR/ Output VSWR	—	1.5	2.5	:1
Noise Figure	—	1.3	1.5	dB
Reverse Isolation	—	-35	—	dB
Output P _{1dB}	5	7	—	dBm
Output IP ₃	—	20	—	dBm
Supply Current(I _D)	—	15	26	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	+7V		

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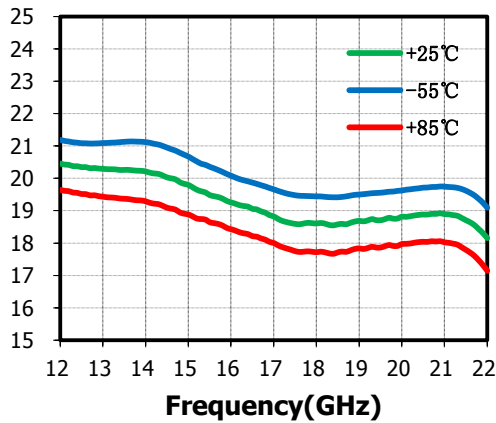
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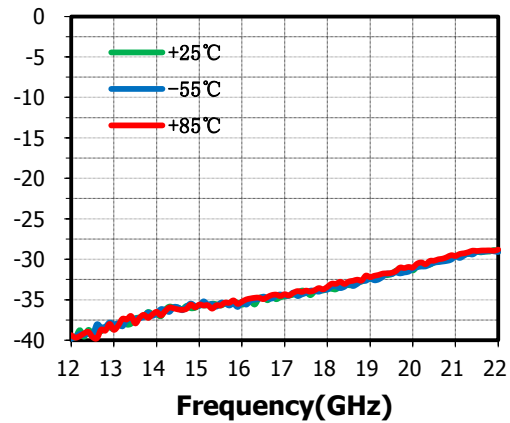
Typical Performance Curve

$V_D=+5V, I_{DQ}=15mA$, The following curves are taken from SAC3088Q3 evaluation board. De-embedding operation has been Implemented.

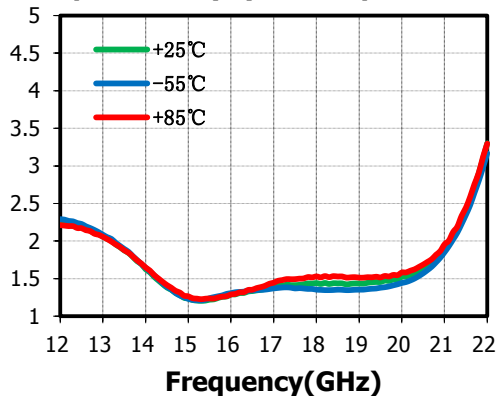
Small Signal Gain(dB) vs.Temperature



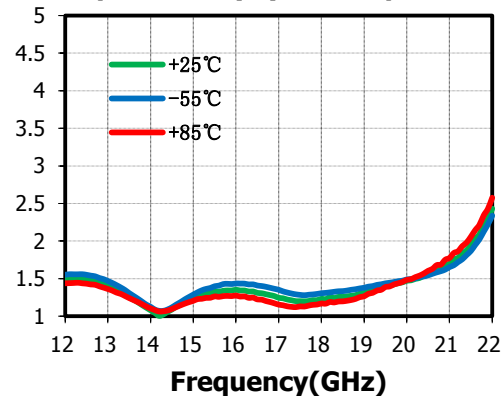
Reverse Isolation(dB) vs.Temperature



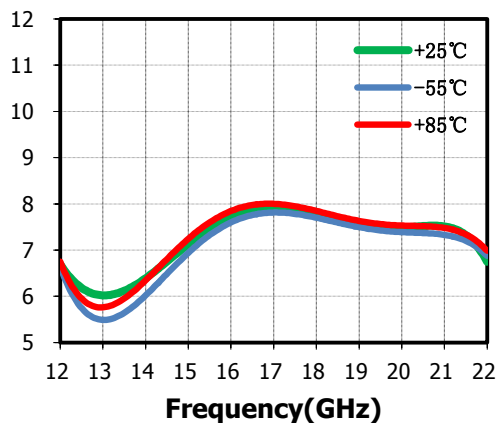
Input VSWR(:1) vs.Temperature



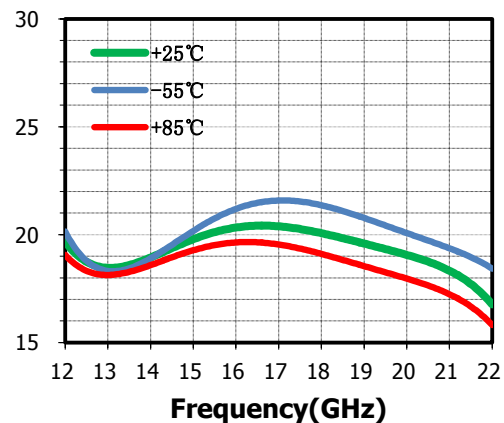
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Output IP₃(dBm) vs.Temperature

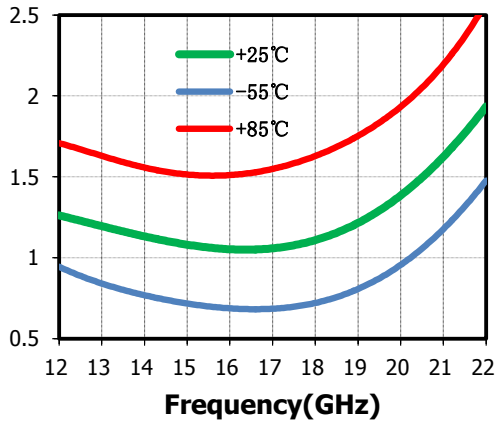


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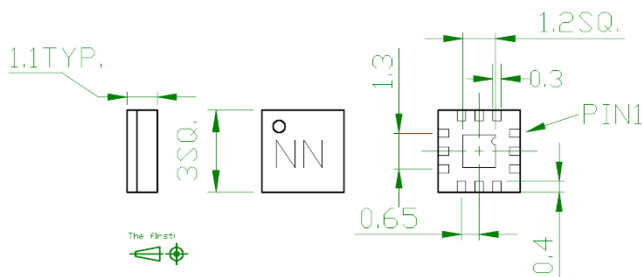
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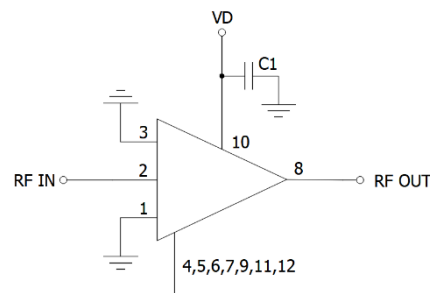
Noise Figure(dB) vs.Temperature



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



Application Circuit



Pin Function

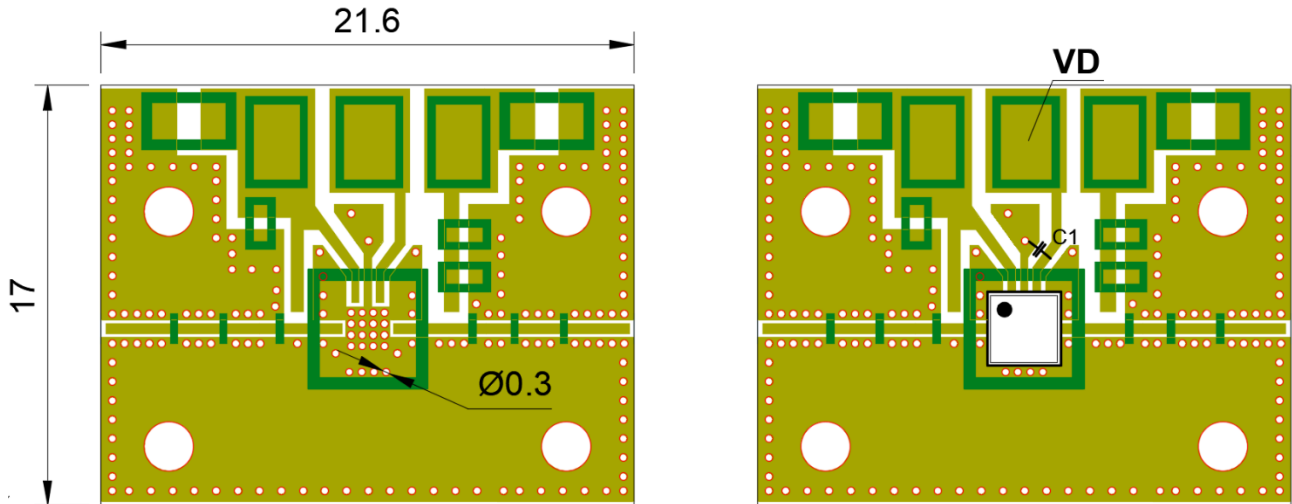
Pin No.	Description	Pin No.	Description
1	Connect to ground	7	Connect to ground
2	RF input, AC Coupled	8	RF output, AC Coupled
3	Connect to ground	9	Connect to ground
4	Connect to ground	10	Drain(VD)
5	Connect to ground	11	NC or Connect to ground
6	Connect to ground	12	NC or Connect to ground

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SAC3088Q3 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 50Ω characteristic impedance.

Components List

Reference Des.	Value	Part Number	Manuf.
C1	0.01 μ F	GRM0336R61A103KE	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.