

SAC3088QP3

GaAs MMIC Low Noise Amplifier
14~18GHz

Rev 1.0

Features

- Frequency: 14~18GHz
- Gain: 18dB
- Noise Figure: 1.2dB Typ. 1.6dB Max
- Output P_{1dB}: 0dBm
- Power Supply: +4V@8mA
- Package Size: 3mmx3mmx1.1mm

Typical Applications

- Point-to-Point Radios
- Phased Arrays

General Description

SAC3088QP3 is a GaAs MMIC Low Noise Amplifier in QFN over molding surface mount package, which operates between in 14~18GHz.

The amplifier can provide 18dB of gain, 0dBm of output P_{1dB} and 1.5dB noise figure and from a 8mA supply current.

SAC3088QP3 is assembled in a 3mm x 3mm QFN plastic package.

Picture



Electrical Performance (T_A=25°C, V_D=+4V, I_D=8mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	14~18			GHz
Gain	15	18	22	dB
Gain Flatness	—	±1	±1.75	dB
Input VSWR/ Output VSWR	—	1.5	2.5	:1
Noise Figure	—	1.2	1.6	dB
Reverse Isolation	—	-35	—	dB
Output P _{1dB}	-4	0	—	dBm
Output IP ₃	—	10	—	dBm
Supply Current(I _D)	—	8	11	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	+5V		

SuperApex, LLC

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SAC3088QP3



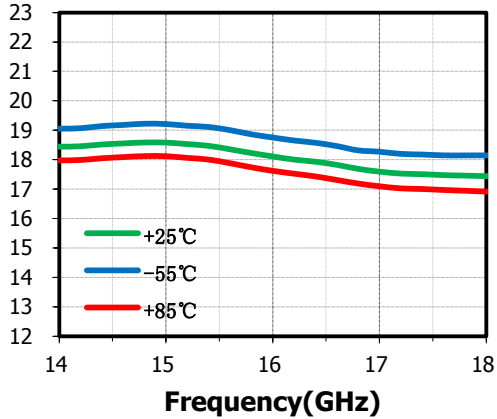
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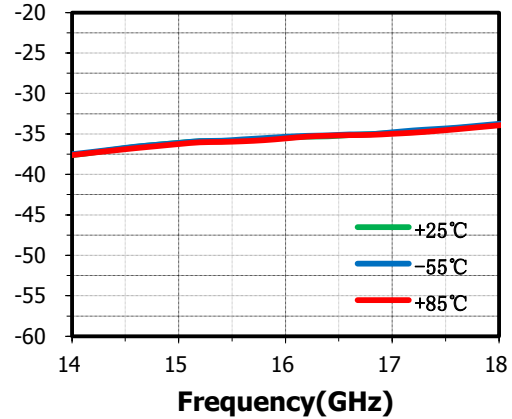
Typical Performance Curve

$V_D=+4V, I_{DQ}=8mA$, The following curves are taken from SAC3088QP3 evaluation board. De-embedding operation has been Implemented.

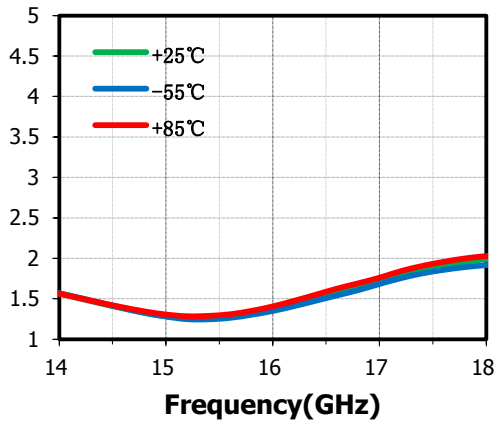
Small Signal Gain(dB) vs.Temperature



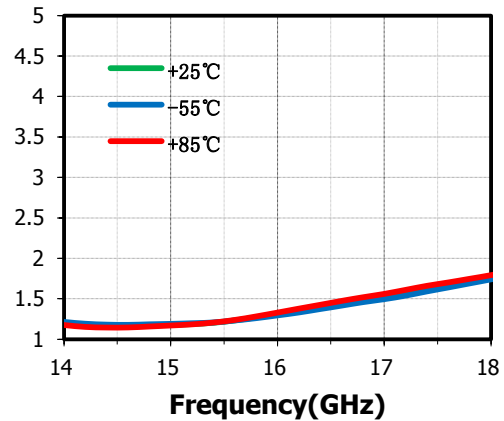
Reverse Isolation(dB) vs.Temperature



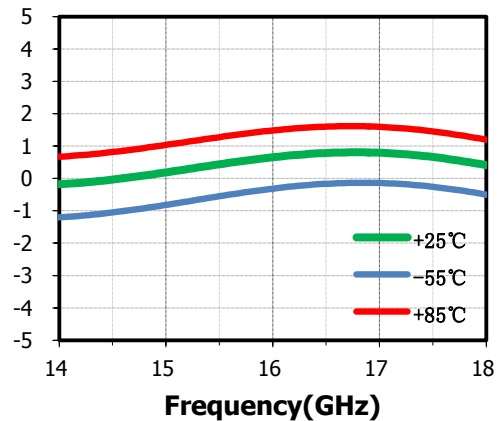
VSWRi(:1) vs.Temperature



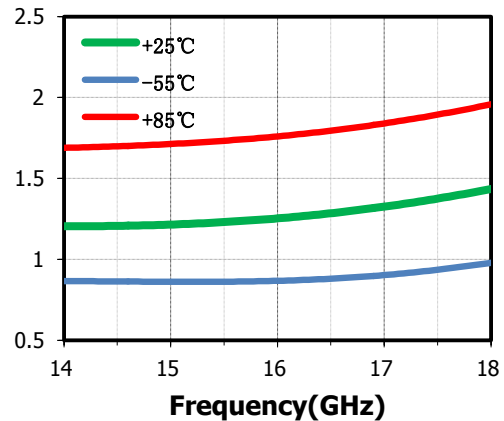
VSWRo(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Noise Figure(dB) vs.Temperature



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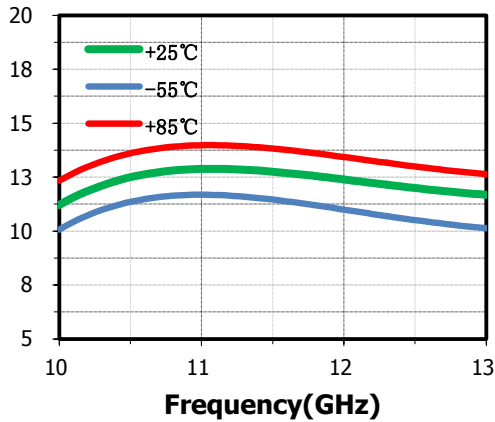
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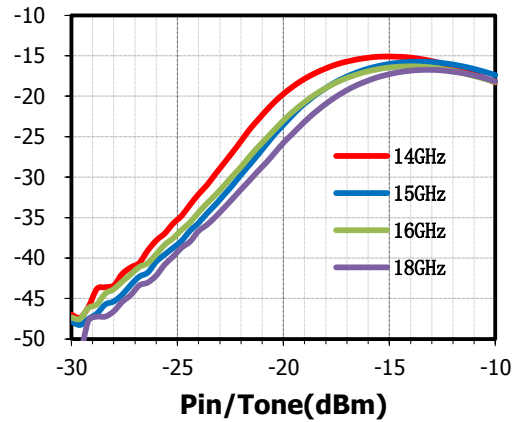
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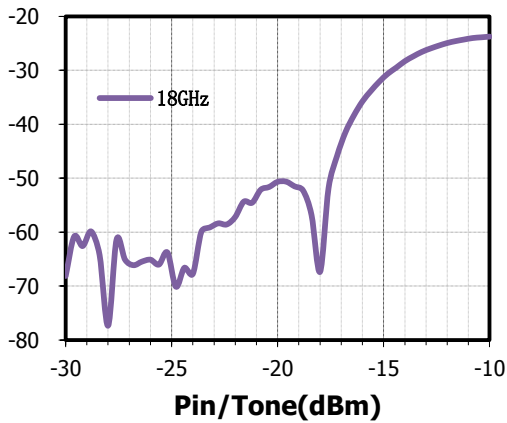
Output IP₃(dBm) vs.Temperature



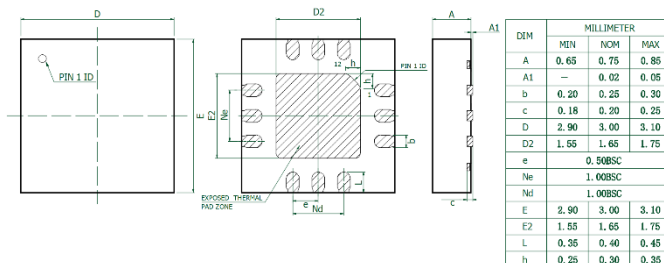
IM₃(dBc) vs.Pin/Tone



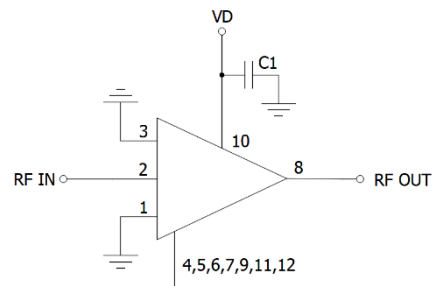
IM₅(dBc) vs.Pin/Tone



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



Application Circuit



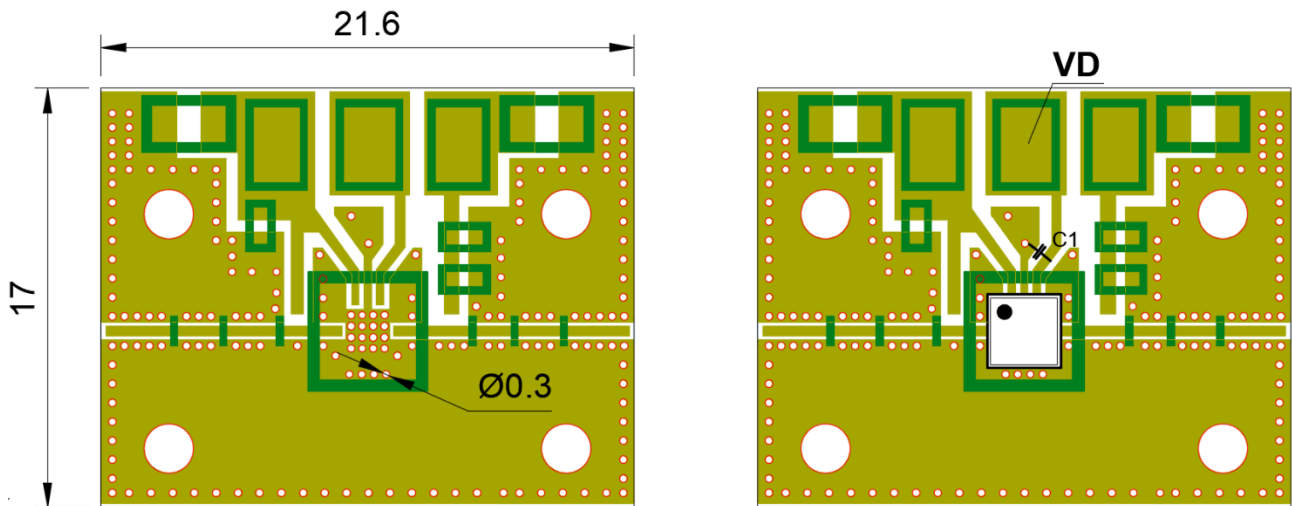
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Pin Function

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	VD
5	Connect to ground	11	NC or Connect to ground
6	Connect to ground	12	NC or Connect to ground

SAC3088QP3 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	0.01uF	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.