

SAC3085Q3

GaAs MMIC Low Noise Amplifier
0.02~8GHz

Rev 1.1

Features

- Frequency: 0.02~8GHz
- Gain: 18dB
- Noise Figure: 1.3dB Typ. 1.8dB Max
- Output P_{1dB}: 17dBm
- Power Supply: +5V@80mA
- Package Size: 3mmx3mmx1.1mm

Typical Applications

- SDR
- Test and Measurement

General Description

SAC3085Q3 is a GaAs MMIC Low Noise Amplifier in QFN surface mount package, which operates between in 0.02~8GHz.

The amplifier can provide 18dB of gain, 17dBm of Output P_{1dB} and 1.3dB noise figure and from a 80mA supply current.

SAC3085Q3 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	0.02~8			GHz
Gain	15	18	24	dB
Gain Flatness	—	±1.5	±2.5	dB
Input VSWR/ Output VSWR	—	1.5	2.5	:1
Noise Figure	—	1.3	1.8	dB
Reverse Isolation	—	-22	—	dB
Output P _{1dB}	15	17	—	dBm
Output IP ₃	—	33	—	dBm
Supply Current(I _D)	—	80	100	mA

Absolute Maximum Ratings

Maximum Input Power	+14dBm,CW 30s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
Supply Voltage	+6V		

SuperApex, LLC

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SAC3085Q3



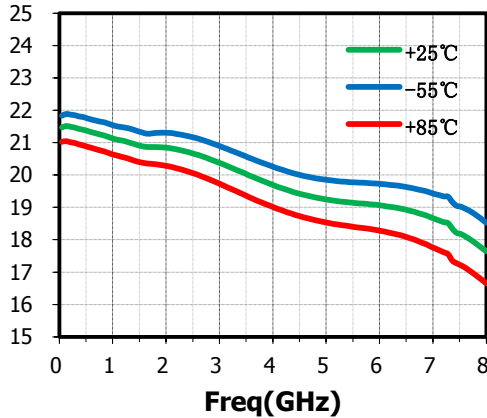
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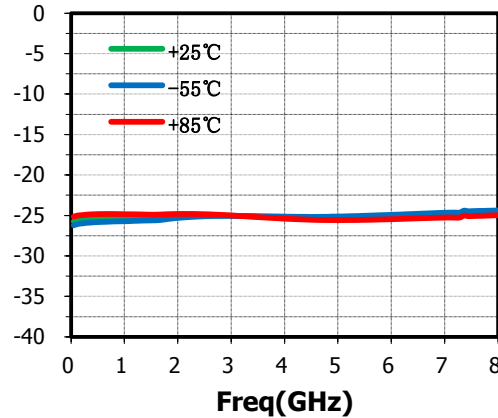
Typical Performance Curve

$V_D=+5V, I_{DQ}=80mA$, The following curves are taken from SAC3085Q3 evaluation board. No De-embedding operation has been Implemented.

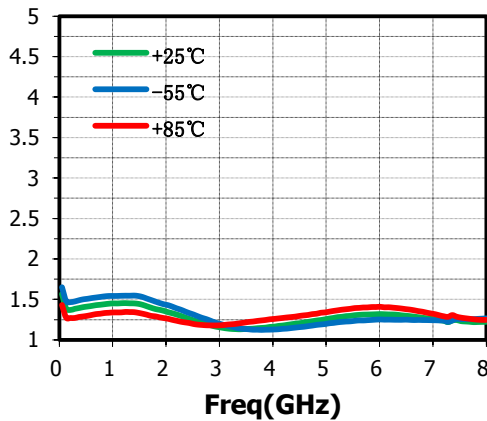
Small Signal Gain(dB) vs.Temperature



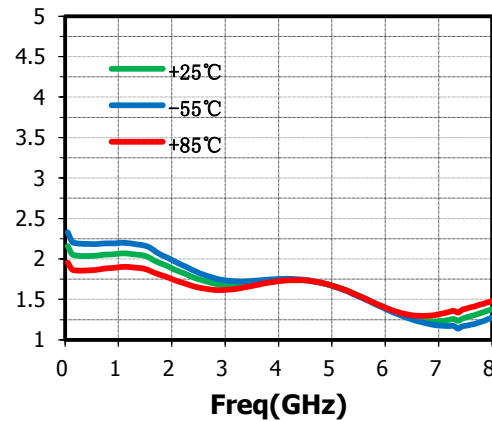
Reverse Isolation(dB) vs.Temperature



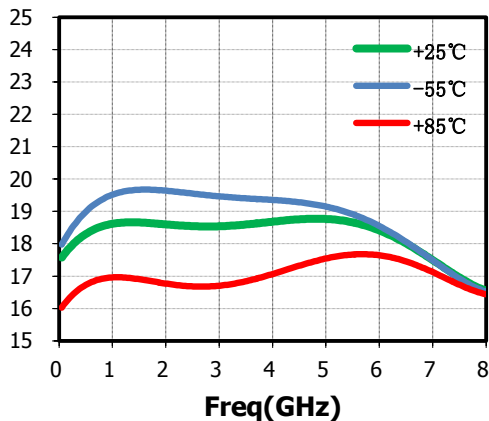
Input VSWR(:1) vs.Temperature



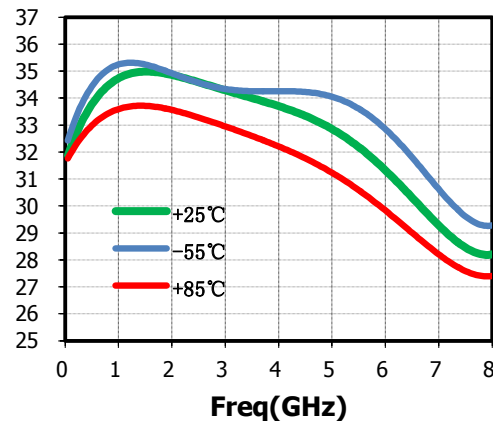
Output VSWR(:1) vs.Temperature



Output P-1dB(dBm) vs.Temperature



Output IP₃(dBm) vs. Temperature



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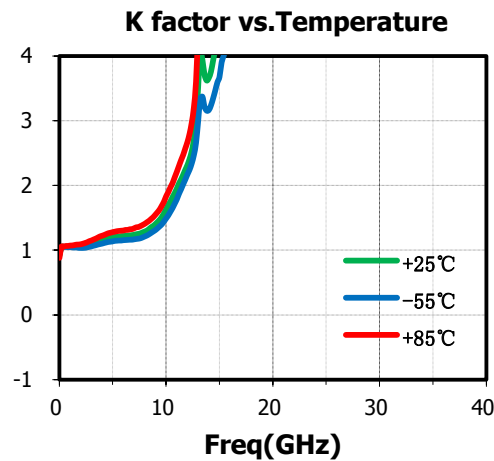
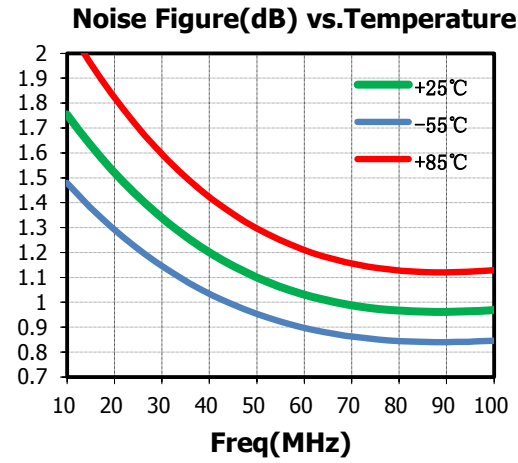
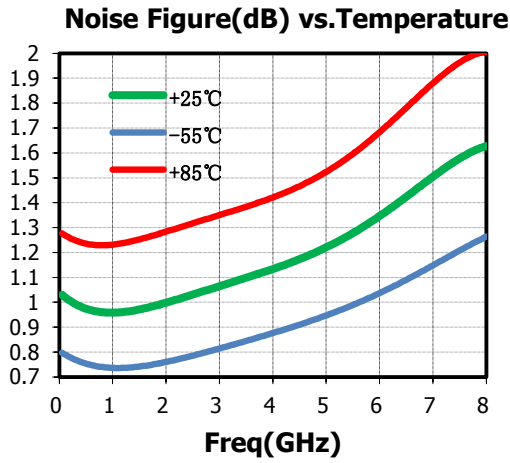
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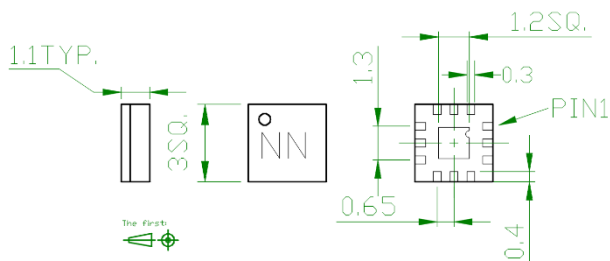


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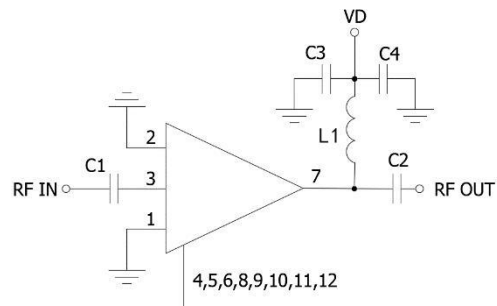
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**Outline Drawing
(All dimensions in mm)**



Application Circuit



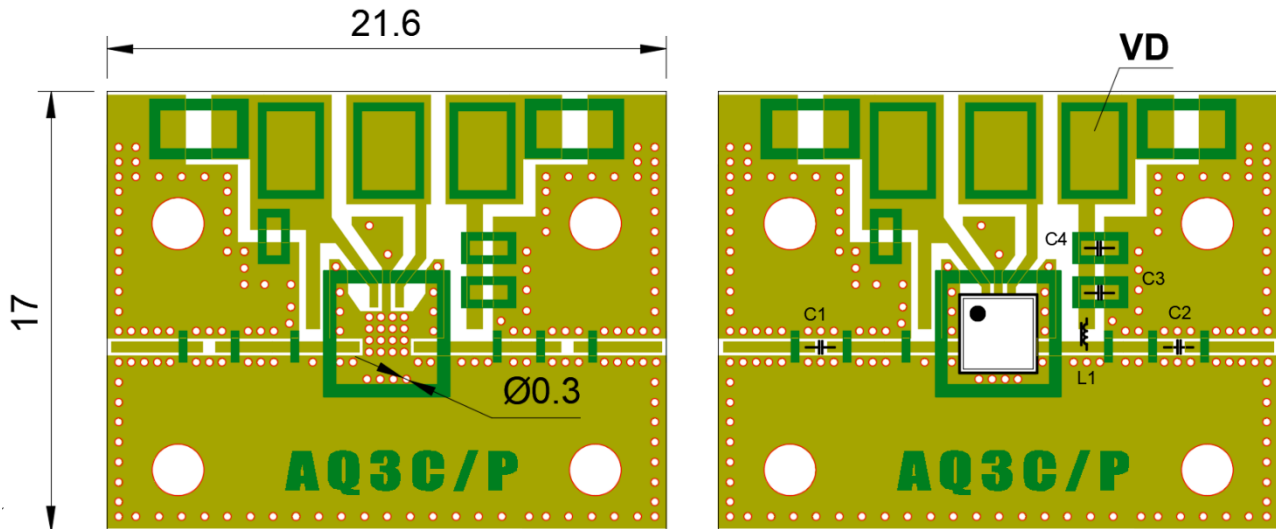
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Pin Function

Pin No.	Description	Pin No.	Description
1	Connect to ground	7	RF output, 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

SAC3085Q3 Evaluation Board



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	-	MMZ1005A222	TDK

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.
3. There is an additional resistor, inductor, and capacitor (RLC) shunt network that aids unconditional stability.