SAC3083Q3

GaAs MMIC Low Noise Amplifier
7~13GHz

Rev 1.2

Features

- Frequency: 7 ~ 13GHz
- Gain: 20dB
- Noise Figure: 1dB Typ., 1.3dB Max.
- $OP_{-1}dB$: 11dBm
- Supply Voltage: +5V@25mA
- Package Size: 3mm×3mm×1.1mm

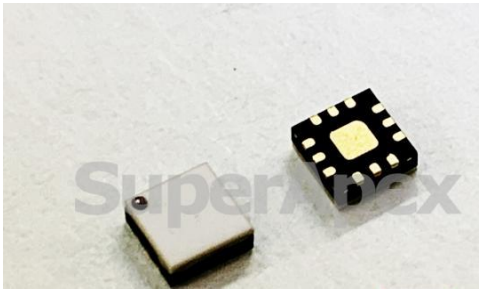
Typical Applications

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

General Description

SAC3083Q3 is a GaAs MMIC Low Noise Amplifier in QFN surface mount package, which operates from 7GHz to 13GHz.
The amplifier can provide 20dB of gain, 11dBm of output $P_{-1}dB$ and 1dB noise figure and from a 25mA supply current.
SAC3083Q3 is assembled in a 3mmx3mm QFN plastic package.

Picture



Electrical Performance (T_A=25℃, V_D=+5V, I_D=25mA, Z_0=50Ω)

Parameter	Min	Typ.	Max	Units
Frequency Range		7 ~ 13		GHz
Gain	17	20	25	dB
Gain Flatness	—	±1.5	±2. 5	dB
Input/Output VSWR	—	1.5	2.2	:1
Noise Figure	—	1	1.3	dB
Reserve Isolation	—	-30	—	dB
Output Power for 1 dB Compression ($OP_{-1}dB$)	10	11	—	dBm
Output Third Order Intercept (OIP_3)	—	25	—	dBm
Supply Current (I_D)	—	25	35	mA

Absolute Maximum Ratings

Maximum Input Power	+27dBm, CW 10s	Operating Temperature	-55°C ~ +85°C
Channel Temperature	+150°C	Storage Temperature	-65°C ~ +150°C
Supply Voltage	+6V		

RoHS

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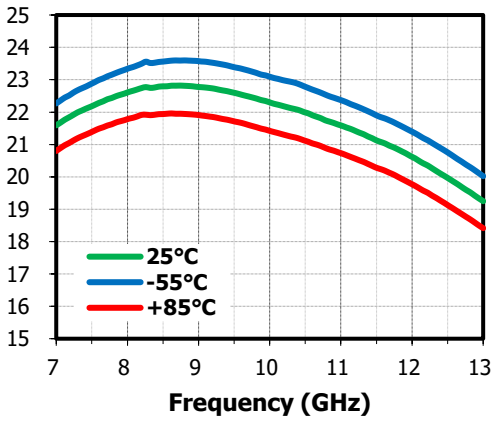
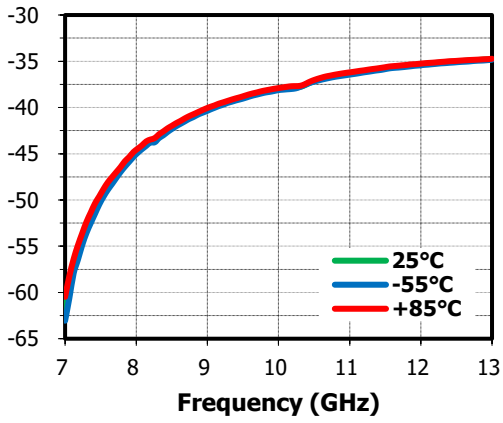
Typical Performance Curve

V_D=+5V, I_{DQ}=25mA

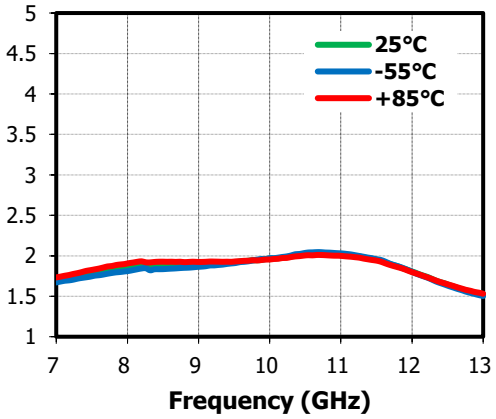
Small Signal Gain (dB) vs. Temperature



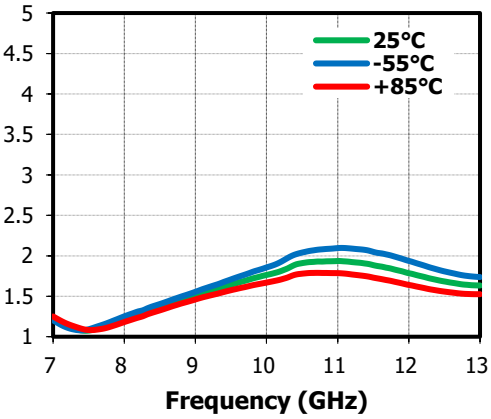
Reverse Isolation (dB) vs. Temperature



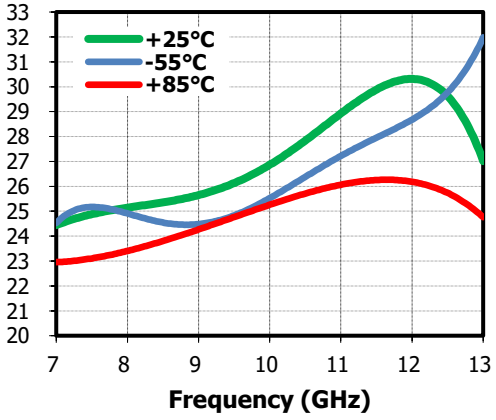
Input VSWR (:1) vs. Temperature



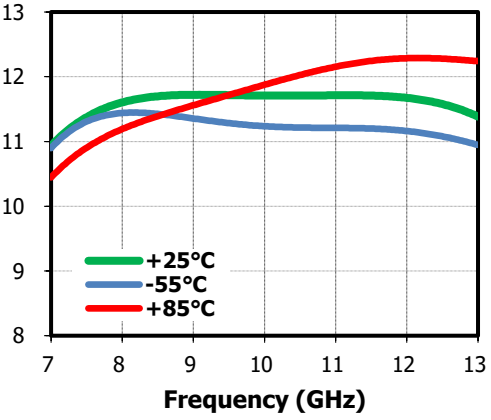
Output VSWR (:1) vs. Temperature



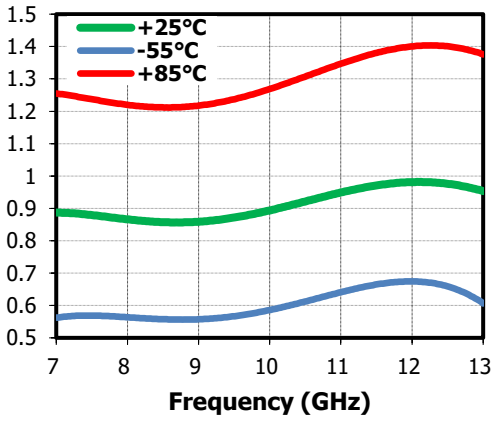
Output IP_3 (dBm) vs. Temperature



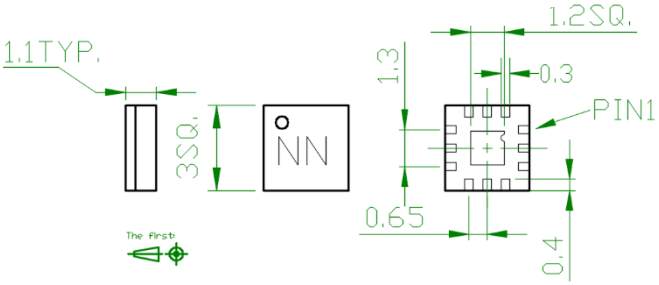
Output P_{-1}dB (dBm) vs. Temperature



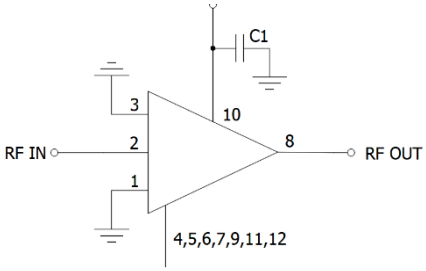
Noise Figure (dB) vs. Temperature



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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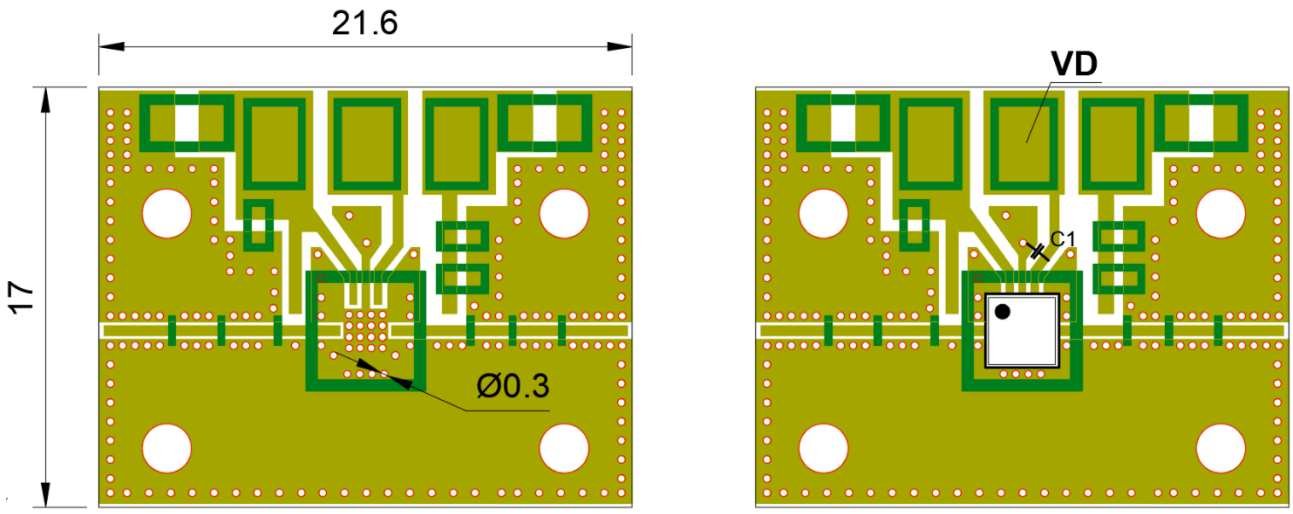
SAC3083Q3 Evaluation Board



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	0.01μF	GRM0336R61A103KE	Murata

Attention:

1. The moisture resistant grade of products is 2a, the storage environment ≤30°C/60% RH, and the surrounding workshop life is 4 weeks.
2. After un-packing, it is necessary to bake the parts for 6 hours in 125+/-5degree environment before soldering.

Revision History

Revision	Date	Comment
1.0	Oct 9, 2019	First Release
1.1	Jun 18, 2024	Revise typo
1.2	Jul 7, 2025	Modify Maximum Input Power

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