# SAC3083Q3

GaAs MMIC Low Noise Amplifier
7~13GHz

Rev 1.1

## 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

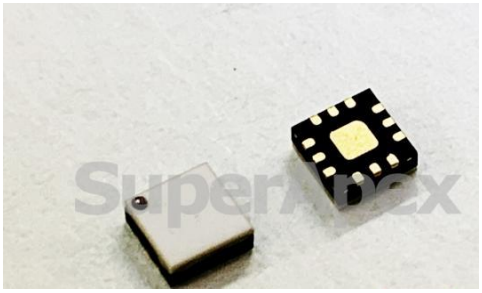
## General Description

SAC3083Q3 is a GaAs MMIC Low Noise Amplifier in QFN surface mount package, which operates between in 7~13GHz.

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 3mm x 3mm 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

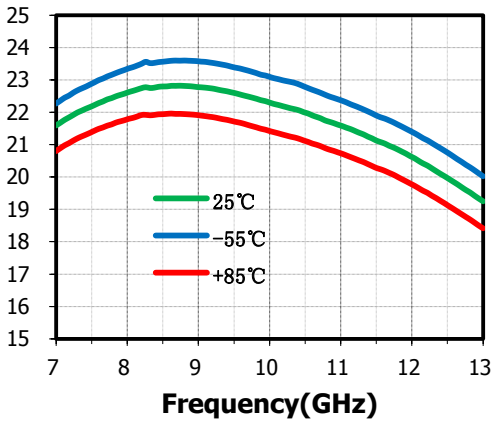
| | | | |
|---|---|---|---|
| Maximum Input Power | +15dBm,CW 30s | Operating Temperature | -55℃~+85℃ |
| Channel Temperature | +150℃ | Storage Temperature | -65℃~+150℃ |
| Supply Voltage | +6V | | |

**SuperApex, LLC**
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

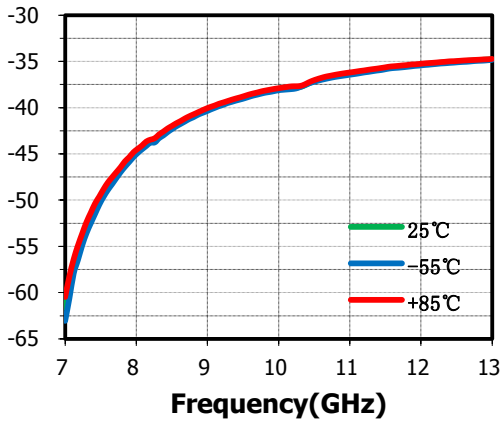
## Typical Performance Curve

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

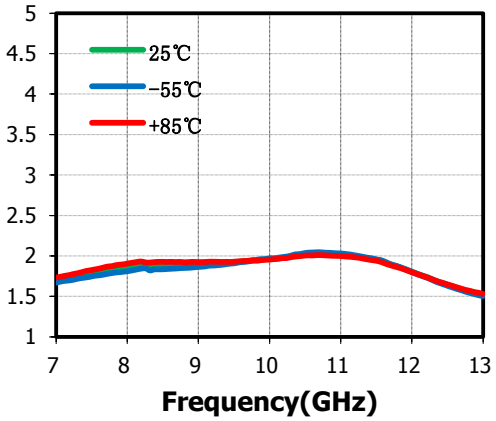
### Small Signal Gain(dB) vs.Temperature



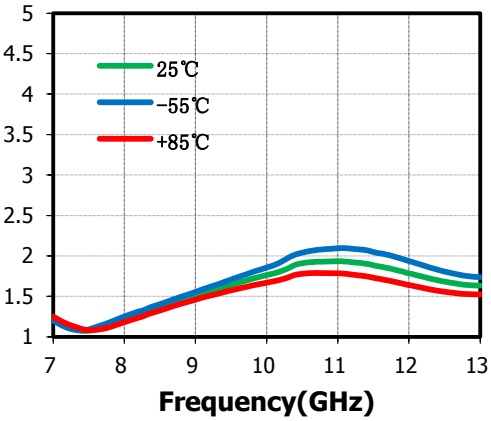

### Reverse Isolation(dB) vs.Temperature



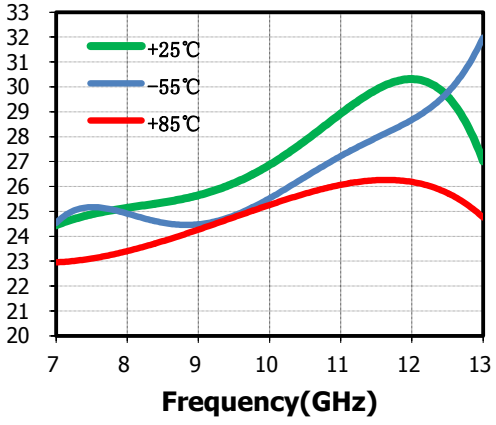

### Input VSWR(:1) vs.Temperature



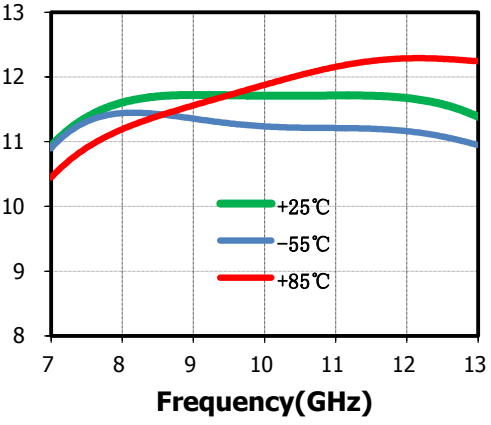

### Output VSWR(:1) vs.Temperature




### Output IP3(dBm) vs.Temperature




### Output P-1dB(dBm) vs.Temperature







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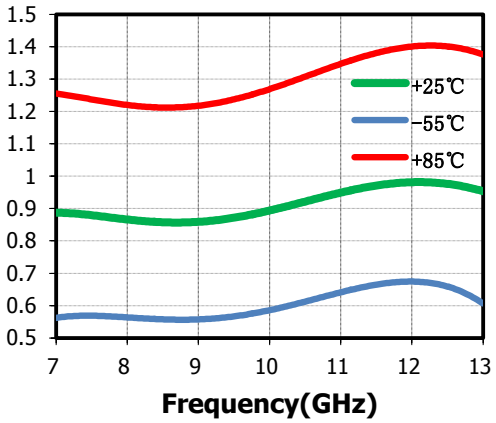
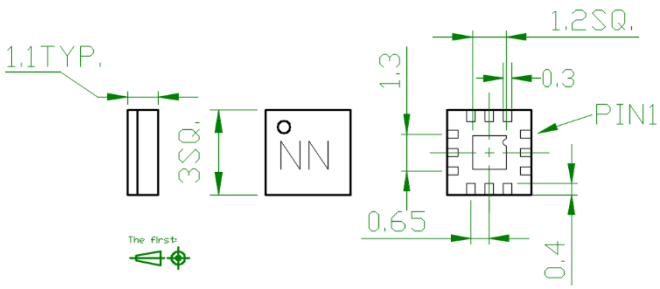
**Noise Figure(dB) vs.Temperature**

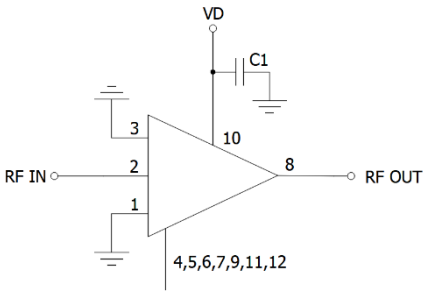



## Outline Drawing

**(All dimensions in mm)**



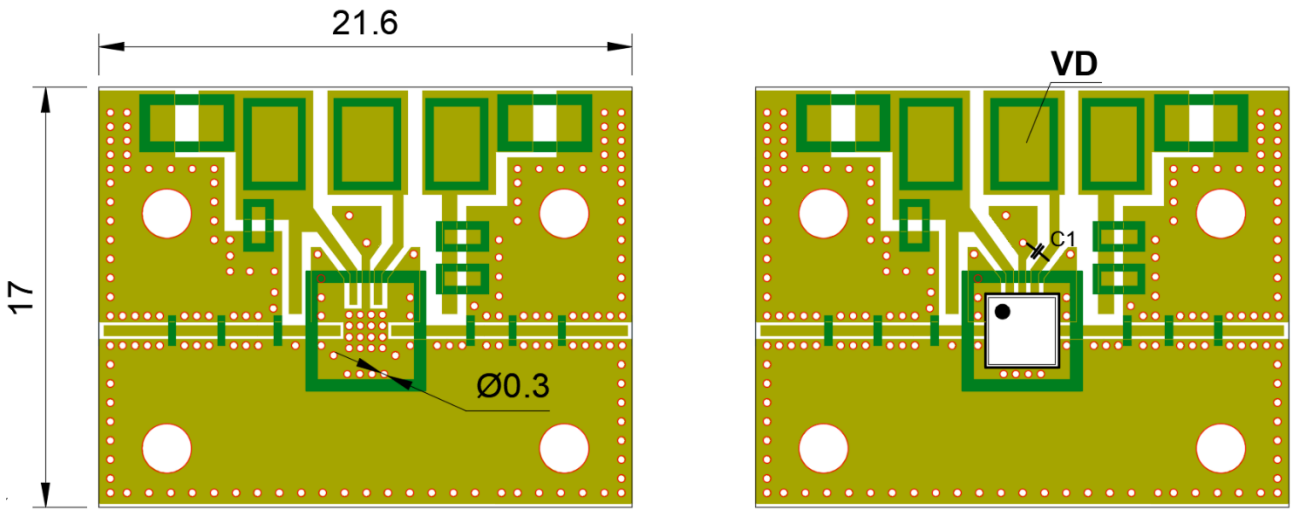

## Application Circuit




## Pin Function

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | 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 |

## 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 | 0.01uF | GRM0336R61A103KE | 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.



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