SAC3933Q3

GaAs MMIC Driver Amplifier
0.5~6GHz 18dBm

Rev 1.0

Features

- Frequency：0.5~6GHz
- Gain：12dB
- Output P_{-1}dB: 18dBm
- Single Power Supply: +5V/80mA
- Output IP_3: 38dBm@3GHz
- Package Size：3mm×3mm×1.1mm

Typical Applications

- SDR
- High density MCM

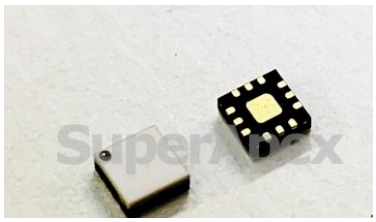
General Description

SAC3933Q3 is a GaAs MMIC Driver Amplifier in QFN surface mount package, which operates between in 0.5~6GHz.

The driver amplifier can provide 12dB of gain, 18dBm of output P_{-1}dB while requiring 80mA from a +5V supply voltage.

SAC3933Q3 is assembled in a 3mm x 3mm QFN plastic package.

Picture



Electrical Performance (T_A=25℃, V_D=+5V, I_D=80mA, Z_0=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range		0.5~6		GHz
Small Signal Gain	10	12	20	dB
Gain Flatness	—	±1.5	±2	dB
Reverse Isolation	—	-20	—	dB
Input/Output VSWR	—	1.75	2.5	:1
Noise Figure	—	2	4.5	dB
Output P_{-1}dB	17	18	—	dBm
Output IP_3	—	38**	—	dBm
Supply Current (I_D)	—	80	100	mA
Supply Voltage (V_D)	5	—	8	V

*Pin/Tone=-5dBm fc=3GHz, △f=4MHz

Absolute Maximum Ratings

Maximum Input Power	+16dBm, CW 30s	Operating Temperature	-55℃~+85℃
Channel Temperature	150℃	Storage Temperature	-55℃~+150℃
Maximum V_D	8V		

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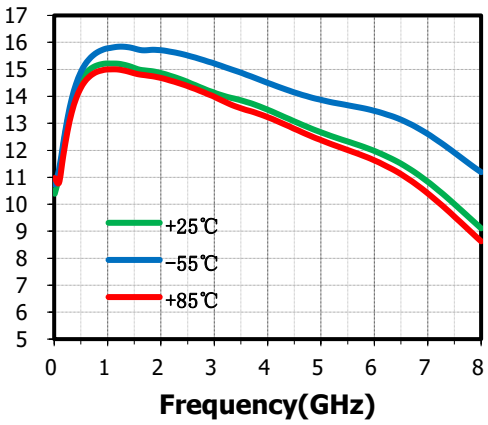
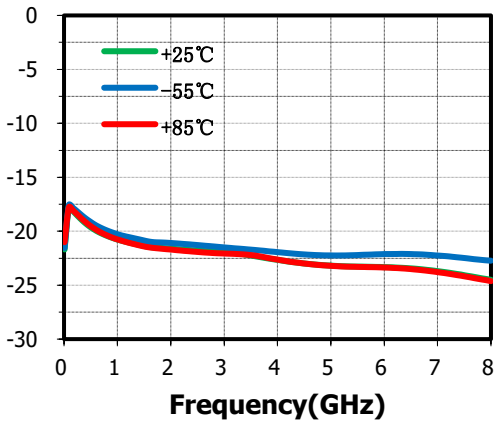
Typical Performance Curve

V_D=+5V，I_{DQ}=80mA, the following curves are taken from SAC3933Q3 evaluation board. No De-embedding operation has been Implemented.

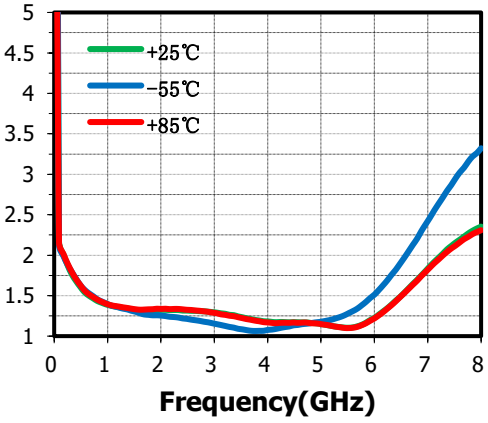
Small Signal Gain(dB) vs.Temperature



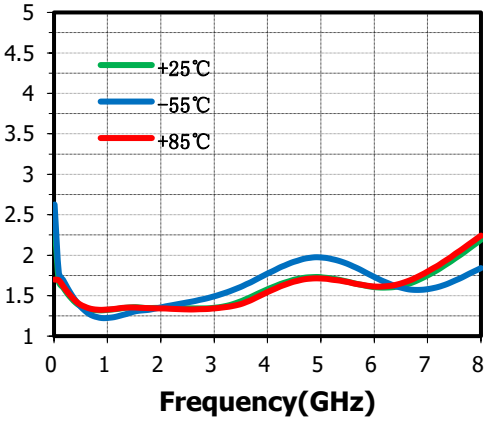
Reverse Isolation(dB) vs.Temperature



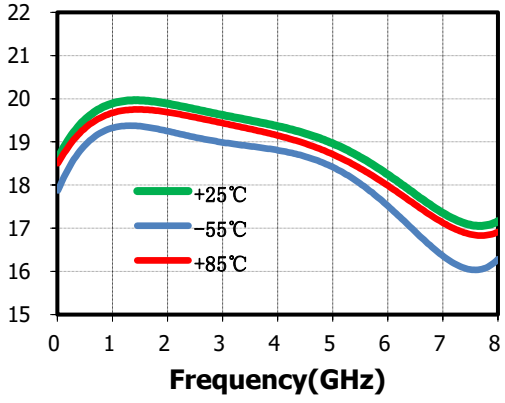
Input VSWR(:1) vs.Temperature



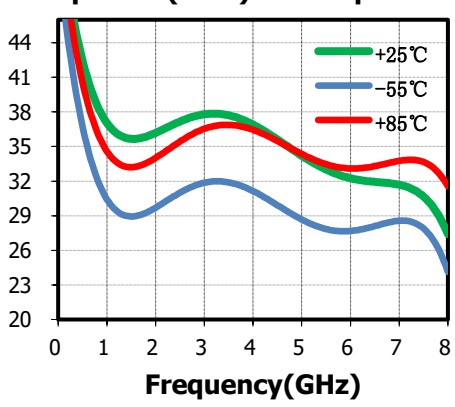
Output VSWR(:1) vs.Temperature



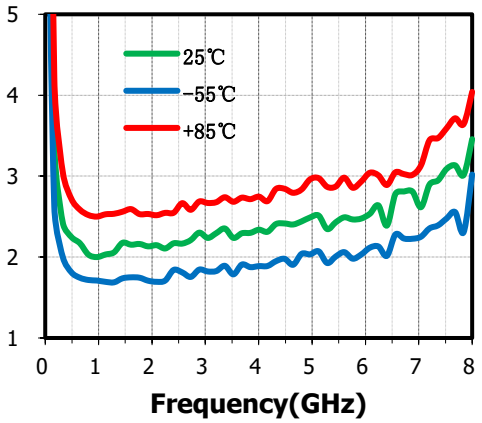
Output P-1dB(dBm) vs.Temperature



Output IP3(dBm) vs.Temperature

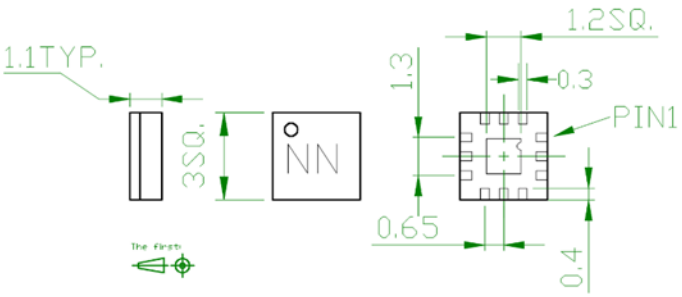


Noise Figure(dB) vs.Temperature

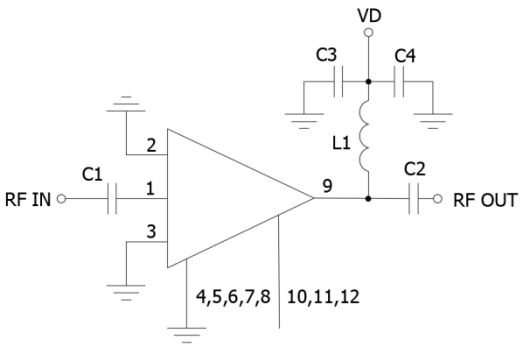


Outline Drawing

(All dimensions in mm)



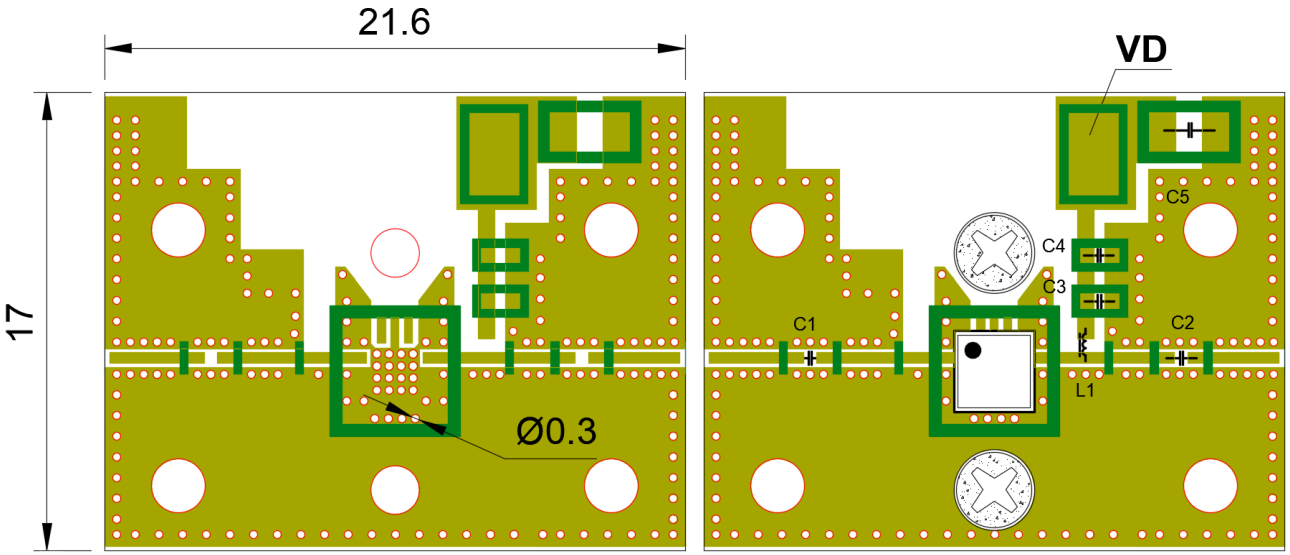
Application Circuit



Pin Function

Pin No.	Description	Pin No.	Description
1	RF input, DC Coupled	7	Connect to ground
2	Connect to ground	8	Connect to ground
3	Connect to ground	9	RF input/Bias, DC Coupled
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

SAC3933Q3 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、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 ≤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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