SAC3913BQ4

GaAs MMIC Driver Amplifier
7.9GHz~9GHz 28dBm

Rev1.1

Features

- Frequency: 7.9GHz~9GHz
- Gain:24dB
- Output P_{-1}dB: 28dBm
- Supply Voltage: +8V
- Power-Added Efficiency: 30%
- Size:4x4x1.2mm
- Packaged: AQFN

Typical Applications

- Point-to-Point Radios
- SATCOM
- Test and Measurement

General Description

SAC3913BQ4 is a GaAs MMIC driver amplifier assembled in a 4x4mm air cavity QFN package. SAC3913BQ4 provides 24dB of gain, and 28dBm of output power for 1 dB compression and 30% PAE from a +8V supply.

Electrical Performance

T_A=25℃, V_D=+8V, I_D=0.23A, Z_0=50Ω, CW

Parameter	Min.	Typ.	Max.	Units
Frequency Range		7.9~9		GHz
Small Signal Gain	20	24	—	dB
Small Signal Gain Flatness	—	±1	±1.5	dB
Reverse Isolation	—	-50	—	dB
Input VSWR	—	1.3	1.8	:1
Output VSWR	—	1.8	2.5	:1
Power-Added Efficiency	—	30	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	27.4	28	—	dBm
Output Third Order Intercept (OIP_3)	—	33	—	dBm
Drain Voltage (V_D)	—	8	8.5	V
Gate Current	—	1	5	mA
Supply Current (I_D)	—	0.23	0.3	A
Thermal Resistance*	—	25	—	℃/W

*Channel to package bottom

Absolute Maximum Ratings

Maximum Input Power	+16dBm	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-65℃~+150℃
Maximum V_D	+9V	Maximum V_G	-1.2V

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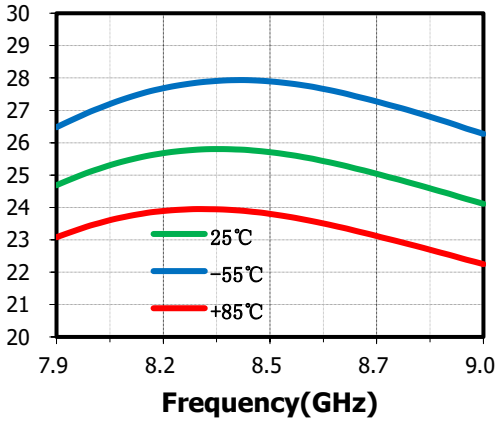
Typical Small Signal Performance Curve

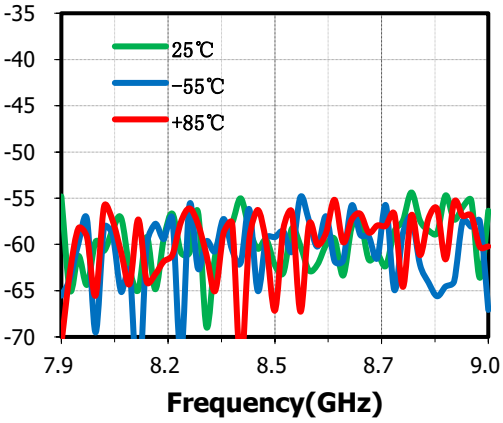
The results captured in the test-jig environment within connector plan

V_D=+8V I_D=0.23A

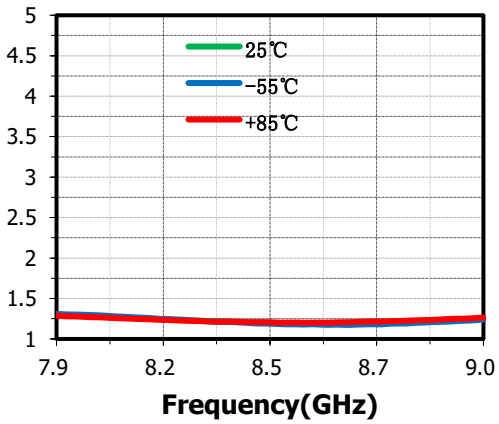
Small Signal Gain(dB) vs.Temperature



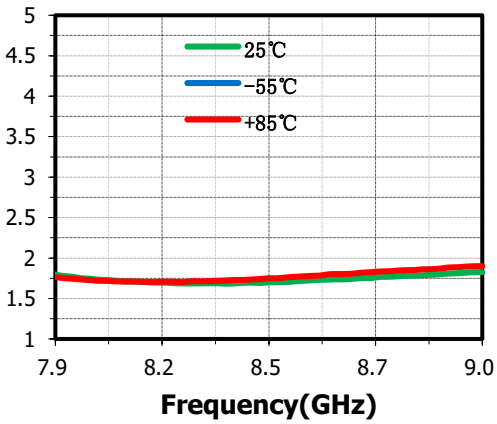
Reverse Isolation(dB) vs.Temperature



Input VSWR(:1) vs.Temperature



Output VSWR(:1) vs.Temperature

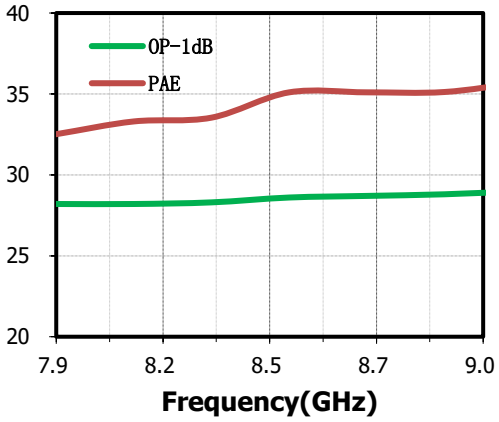


Power and PAE Performance Curve

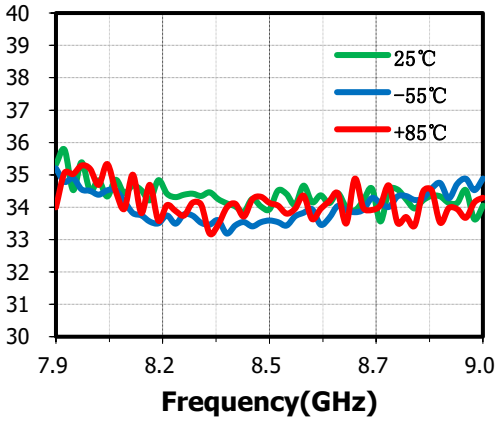
The results captured in the test-jig environment within connector plan, then de-embedded the housing an come back in the package plan

V_D=+8V I_D=0.23A

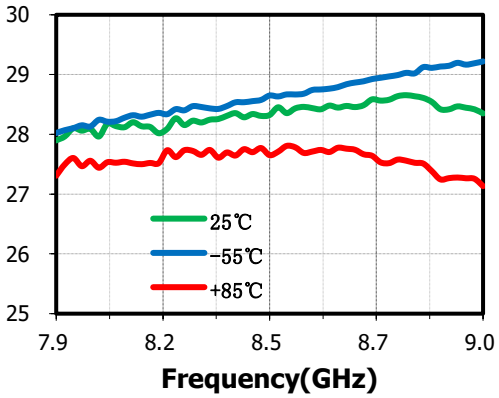
OP-1dB(dBm),PAE(%) vs.Freq.



Output IP3(dBm) vs.Temperature



Output P-1dB(dBm) vs.Temperature



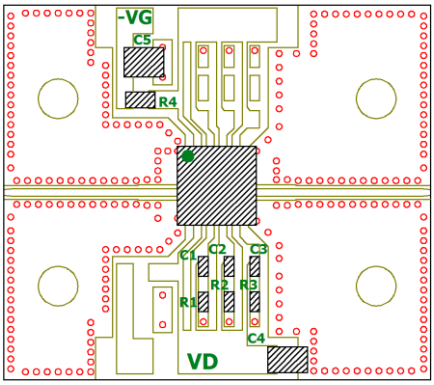
PCB Material Specifications

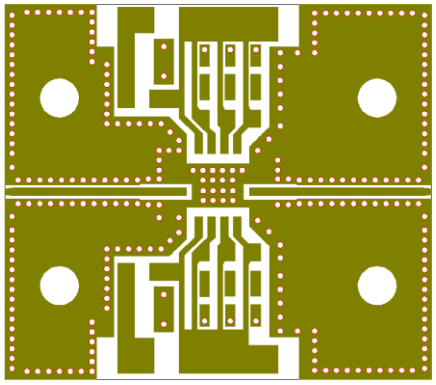
Top Layer: 1/2 oz Copper Cladding, 0.017mm thickness

Dielectric Layer: Rogers RO4350B, 0.254mm thickness

Bottom Layer: 1/2 oz Copper Cladding, 0.017 mm thickness

Application PCB Layout





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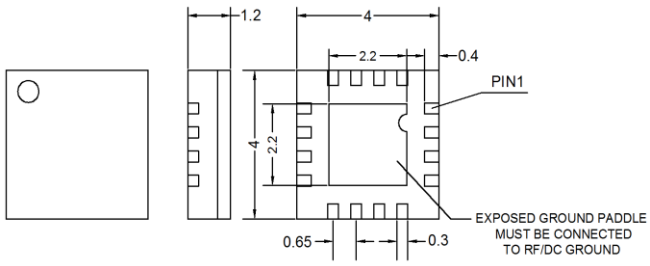
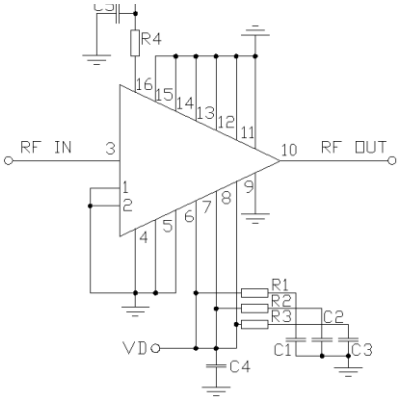
Outline Drawing

(All dimensions in mm)



Application Circuit



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C4、C5	10uF	CGA4J3X5R1A106K125AB	TDK	0805
C1、C2、C3	0.47uF	—	—	0402
R1、R2、R3	2.2Ω	—	—	0402
R4	0Ω	—	—	0603

Notes

1. SAC3913BQ4 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -0.6~-0.85V, Apply gate voltage first.
2. Specifications are derived from measurements in a 50ohm test environment. Aspects of the amplifier performance may be improved over a narrower bandwidth by application of additional conjugate, linearity, or high PAE (opt) matching.
3. Static Sensitivity, these electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these HBM Class 1A devices.
4. MSL 1A

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