

SAC3913BQ4

GaAs MMIC Driver Amplifier
7.9GHz~9GHz 28dBm

Rev1.1

Features

- Frequency: 7.9GHz~9GHz
- Gain:24dB
- Output P_{-1dB}: 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°C, V_D=+8V, I_D=0.23A, Z₀=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 _{-1dB}) | 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 | — | °C/W |

*Channel to package bottom

Absolute Maximum Ratings

| | | | |
|------------------------|--------|------------------------|--------------|
| Maximum Input Power | +16dBm | Operating Temperature | -55°C~+85°C |
| Channel Temperature | +150°C | Storage Temperature | -65°C~+150°C |
| Maximum V _D | +9V | Maximum V _G | -1.2V |

SuperApex Corporation

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

SAC3913BQ4

GaAs MMIC Driver Amplifier
7.9GHz~9GHz 28dBm

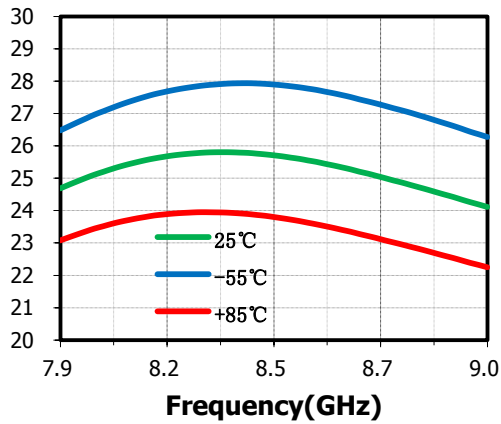
Rev1.1

Typical Small Signal Performance Curve

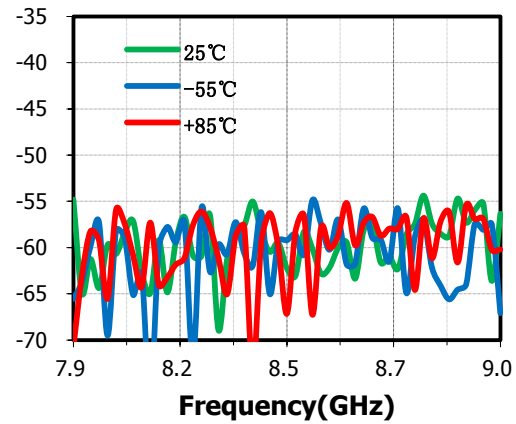
The results captured in the test-jig environment within connector plan

$V_D=+8V$ $I_D=0.23A$

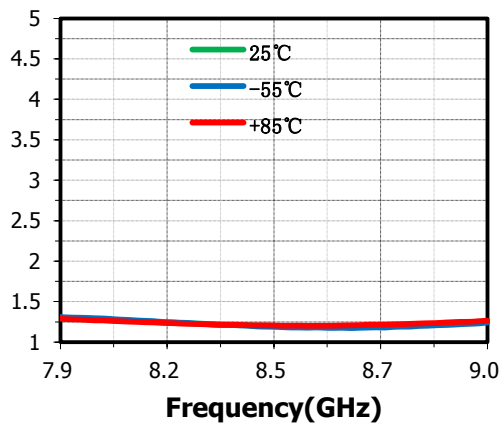
Small Signal Gain(dB) vs.Temperature



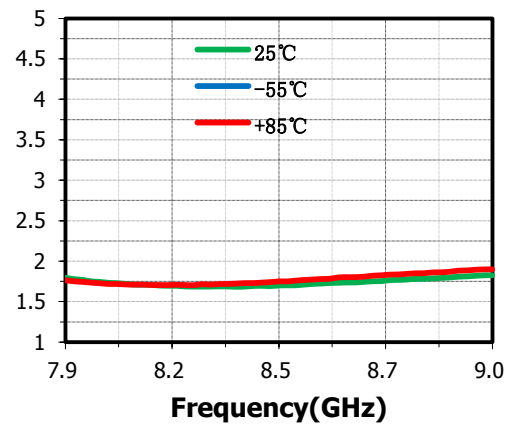
Reverse Isolation(dB) vs.Temperature



Input VSWR(:1) vs.Temperature



Output VSWR(:1) vs.Temperature



SAC3913BQ4

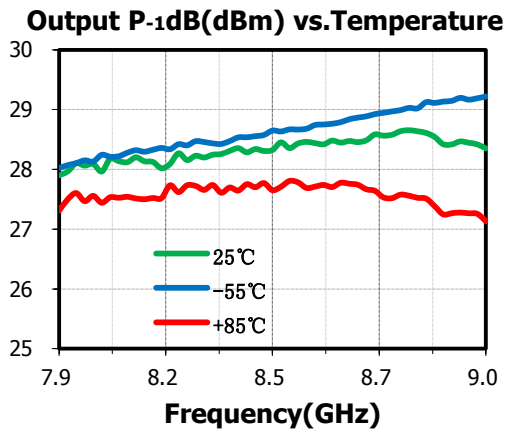
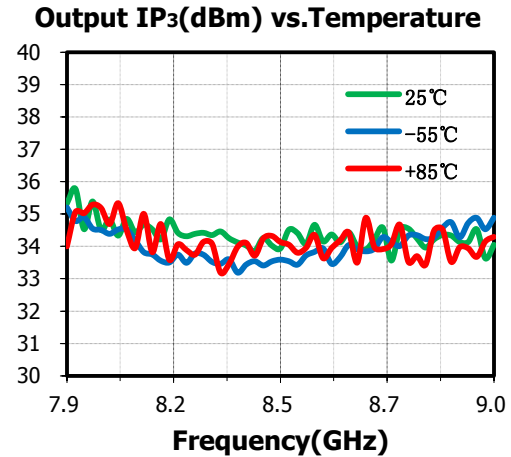
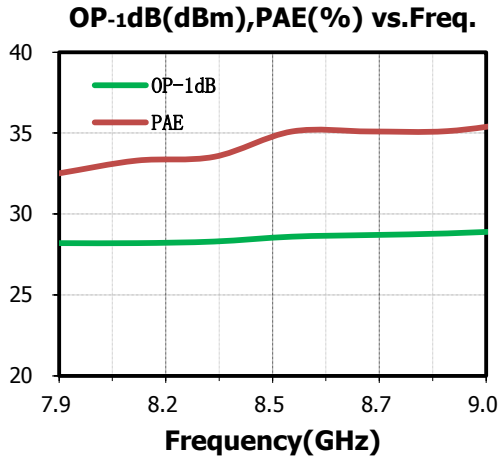
GaAs MMIC Driver Amplifier
7.9GHz~9GHz 28dBm

Rev1.1

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

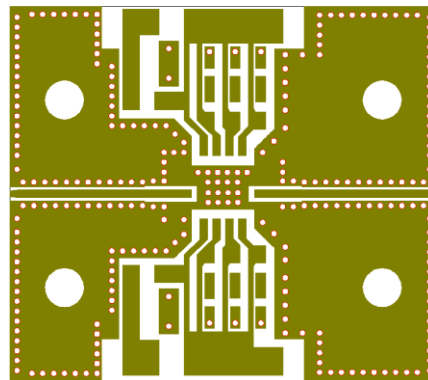
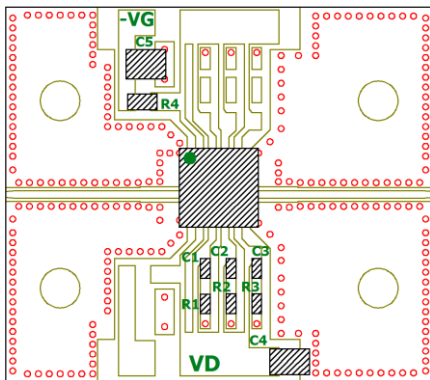
$V_D = +8V$ $I_D = 0.23A$



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



SuperApex Corporation

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

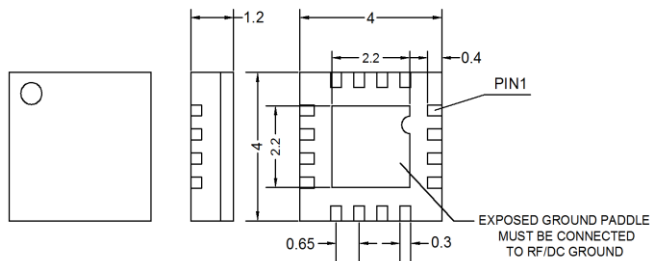
SAC3913BQ4

GaAs MMIC Driver Amplifier
7.9GHz~9GHz 28dBm

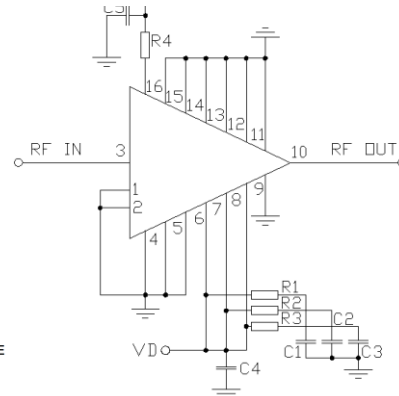
Rev1.1

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 more narrow 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

SuperApex Corporation

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