

SAC3204S



GaAs MMIC SPDT Switch
DC~4GHz

Rev 1.3

Features

- Frequency Range: DC~4GHz
- Isolation: 60dB@4GHz
- Insertion Loss: 0.8dB
- Non-reflective Switch
- Nanosecond Switch
- Die Size: 1.32mm×1.21mm×0.1mm

Typical Applications

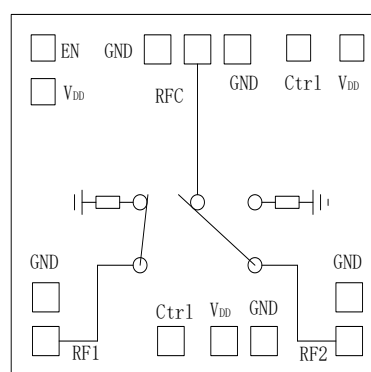
- Radar and ECM
- RF/ Microwave radio
- Test and Instrumentation
- Fiber Optics

General Description

SAC3204S is a general purpose broadband high isolation non-reflective GaAs pHEMT SPDT switch in bare die. The switch offers over 50dB isolation and less than 0.8dB insertion loss over operation frequency. Its fast switching and compact size make this absorptive SPDT ideal for many critical applications. The switch operates using complementary positive control voltage logic lines of 0/+3~+5V.

The chip offers full passivation for increased reliability and moisture protection. This amplifier is the perfect alternative to higher cost hybrid amplifiers.

Functional Diagram



Electrical Performance

($T_A=+25^{\circ}\text{C}$, $V_{DD}=+5\text{V}$, Control Voltage=0/+3~+5V, $Z_0=50\Omega$)

| Parameter | Freq. | Min. | Typ. | Max. | Units |
|--------------------------|---------|------|------|------|-------|
| Insertion Loss | DC~4GHz | — | -0.8 | — | dB |
| Isolation | DC~4GHz | — | -70 | — | dB |
| Return Loss RFC(ON) | DC~4GHz | — | -20 | — | dB |
| Return Loss RF1,RF2(OFF) | DC~4GHz | — | -20 | — | dB |
| Input P _{-1dB} | DC~4GHz | — | 29 | — | dBm |
| Switching Speed | DC~4GHz | — | 50 | — | ns |

Absolute Maximum Ratings

| | | | |
|-----------------------|-------------|-----------------------|--------------|
| Input power | 30dBm | Control Voltage Range | +0~5.5V |
| Channel Temperature | 150°C | Storage Temperature | -65°C~+150°C |
| Operating Temperature | -55°C~+85°C | ESD Sensitivity (HBM) | Class 1A |
| VDD | +4~5.5V | | |

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Bias Voltage & Current

| V_{DD} | I_D |
|----------|-------|
| 5V | 2.2mA |

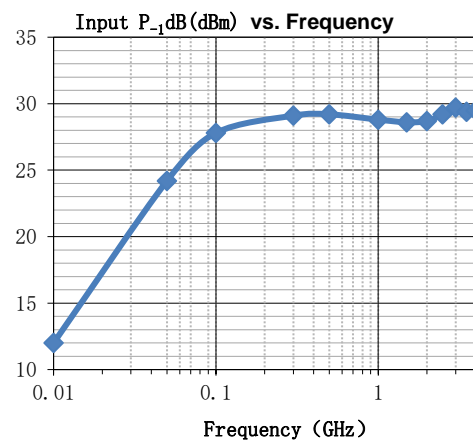
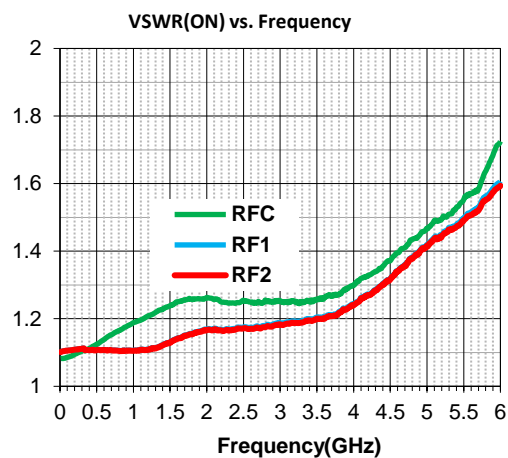
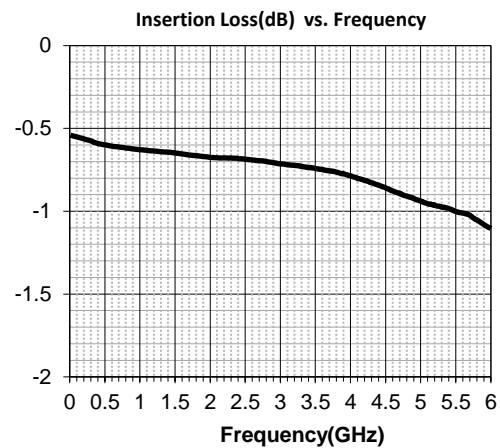
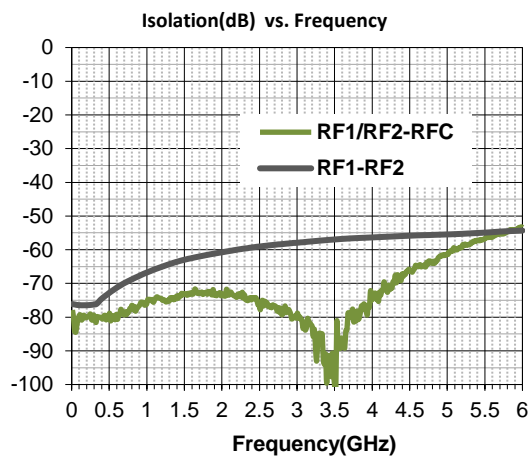
Control Voltage

| State | Bias Condition |
|-------|----------------|
| Low | 0~0.8V |
| High | 3~5V |

Truth Table

| Control Input | | Signal Path State | |
|---------------|------|-------------------|---------|
| Ctrl | EN | RFC-RF1 | RFC-RF2 |
| Low | Low | OFF | ON |
| High | Low | ON | OFF |
| Low | High | OFF | OFF |
| High | High | OFF | OFF |

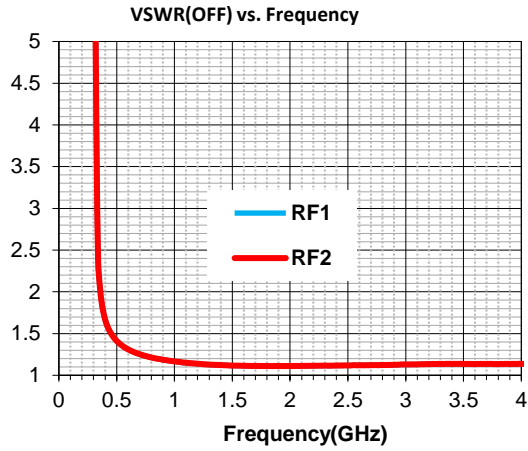
Typical Performance Curve



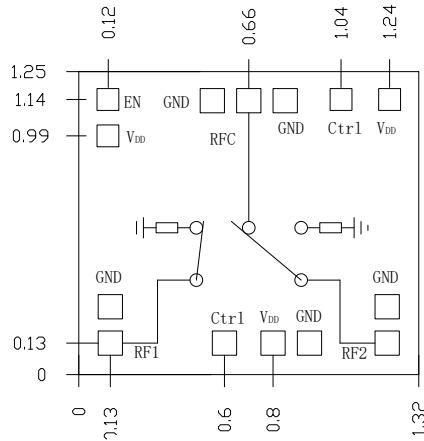
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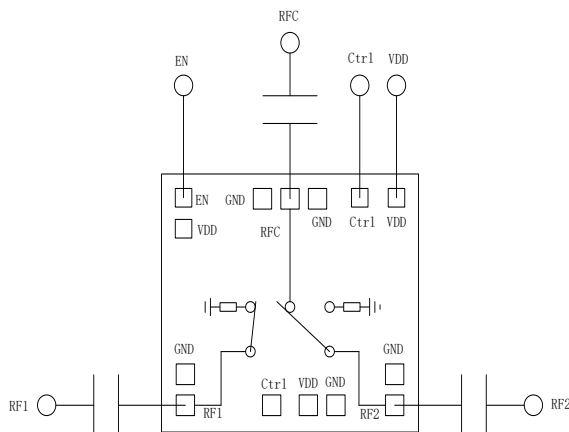
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Die Outline (All dimensions in mm)



Assembly Diagram



Attention:

GaAs MMIC devices are susceptible to damage from electrostatic discharge. Proper precautions should be observed during handling, assembly and test.