

SAC3308Q6

GaAs MMIC 6-BIT DIGITAL PHASE SHIFTER
14~18GHz

Rev 1.1

Features

- Frequency: 14~18GHz
- RMS of Phase Accuracy: 2.5°
- Low Insertion Loss: 10dB
- Positive Voltage Control
- Size: 6mm×6mm×1.2mm

Typical Applications

- EW
- Military Radar and Weather Radar
- SATCOM
- Beamforming Modules
- Phase Cancellation

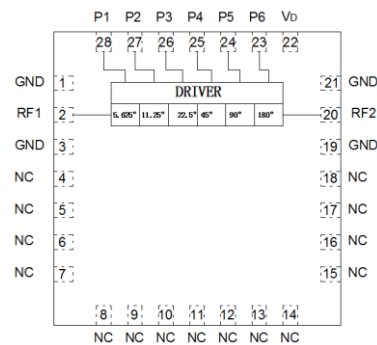
General Description

SAC3308Q6 is a 6-bit digital phase shifter which works from 14 to 18 GHz, providing 360 degrees of phase coverage with a LSB of 5.625 degrees.

SAC3308Q6 features very low RMS phase error of 2.5 degrees and extremely low insertion loss variation of ± 0.5 dB across all phase states. This high accuracy phase shifter is controlled with positive control voltage of 0/+5V.

The bare chip is assembled in 6×6mm of QFN package.

Functional Diagram



Electrical Performance ($T_A = +25^\circ\text{C}$, $V_D = -5\text{V}$, Control Voltage = 0/+5V, $Z_0 = +50\Omega$)

| Parameter | Min. | Typ. | Max. | Units |
|-----------------------|-------|-----------|------|-------|
| Frequency | 14~18 | | | GHz |
| RF1 Return Loss | — | -15 | — | dB |
| RF2 Return Loss | — | -15 | — | dB |
| Insertion Loss | — | -10 | — | dB |
| IL Variation | — | ± 0.5 | — | dB |
| Phase Accuracy | — | ± 4.0 | — | ° |
| RMS of Phase Accuracy | — | 2.5 | — | ° |

Truth Table (0 : 0V , 1 : +5V)

| Phase | P1 | P2 | P3 | P4 | P5 | P6 |
|-----------|----|----|----|----|----|----|
| REF | 0 | 0 | 0 | 0 | 0 | 0 |
| -5.625° | 1 | 0 | 0 | 0 | 0 | 0 |
| -11.25° | 0 | 1 | 0 | 0 | 0 | 0 |
| -22.5° | 0 | 0 | 1 | 0 | 0 | 0 |
| -45° | 0 | 0 | 0 | 1 | 0 | 0 |
| -90° | 0 | 0 | 0 | 0 | 1 | 0 |
| -180° | 0 | 0 | 0 | 0 | 0 | 1 |
| -354.375° | 1 | 1 | 1 | 1 | 1 | 1 |

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Absolute Maximum Ratings

| | | | |
|-----------------------|--------|-----------------------|--------------|
| Maximum Input Power | +18dBm | Operating Temperature | -55°C~+85°C |
| Maximum Input Voltage | -8V | Storage Temperature | -65°C~+150°C |

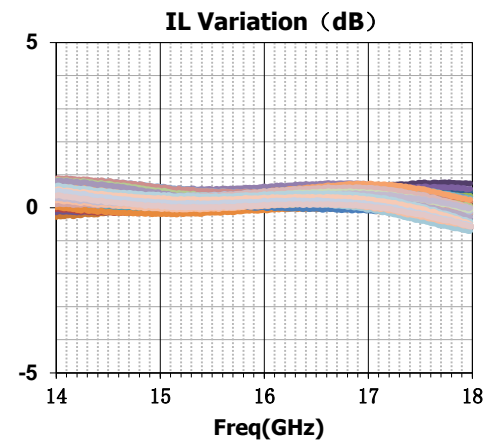
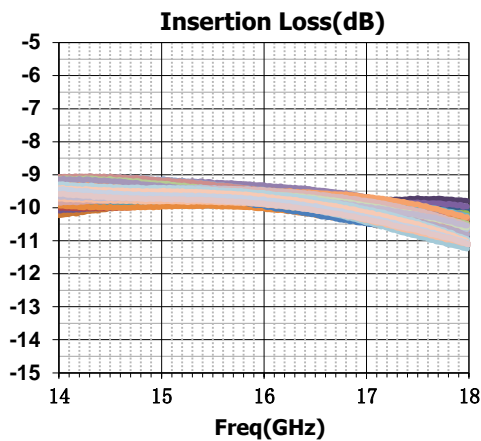
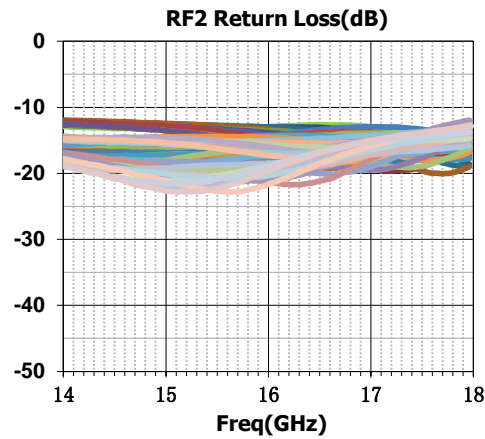
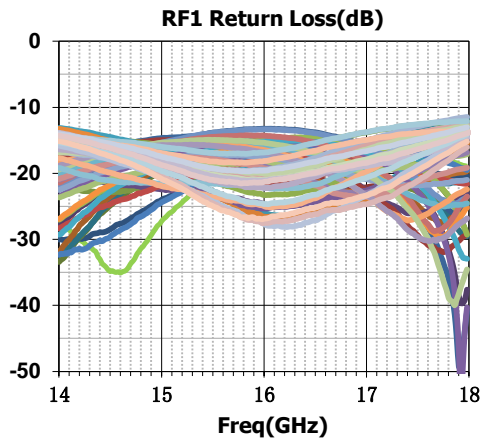
Control Voltage

| State | Bias |
|-------|----------|
| Low | 0~0.2V |
| High | 4.5~5.5V |

Power Supply

| V _D | I _D |
|----------------|----------------|
| -5V | 8mA |

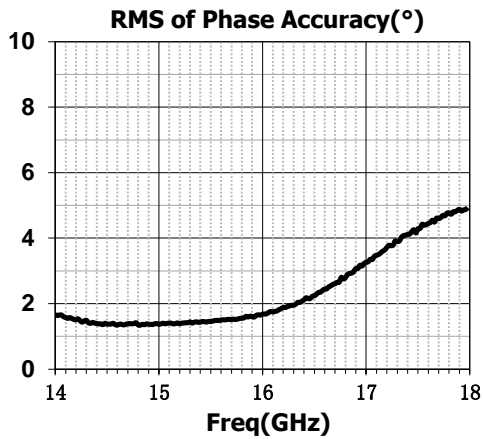
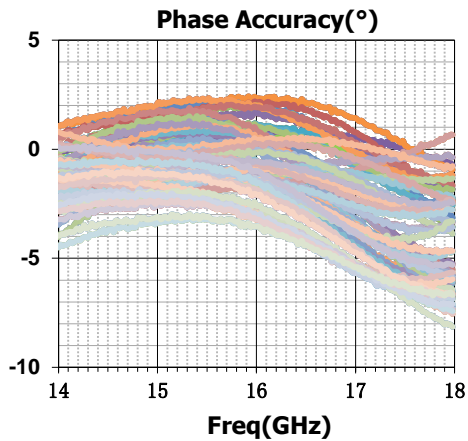
Typical Performance Curve



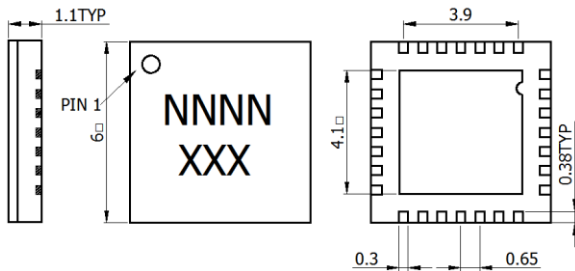
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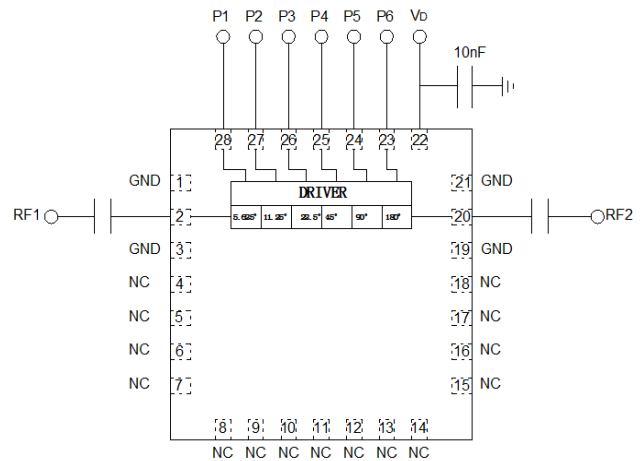
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Outline Drawing
(all dimensions in mm)



Assembly Diagram



Attention:

1. The moisture resistant grade of products is 2A, the storage environment $\leq 30^{\circ} \text{C}/60\% \text{RH}$, 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.