

SAC3304Q6

GaAs MMIC 6-Bit Digital Phase Shifter
2.7~3.5GHz

Rev 1.3

Features

- Frequency: 2.7~3.5GHz
- RMS of Phase Accuracy: 2°
- Low Insertion Loss: 5.5dB
- Positive Voltage Control
- Size: 6mm×6mm×1.2mm

General Description

SAC3304Q6 is a 6-bit digital phase shifter which works from 2.7 to 3.5GHz, providing 360 degrees of phase coverage with a LSB of 5.625 degrees.

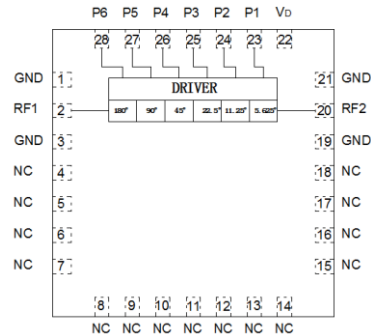
SAC3304Q6 features very low RMS phase error of 2 degrees and extremely low insertion loss variation of ±0.5dB across all phase states. This high accuracy phase shifter is controlled with positive control voltage of 0/+5V.

The device is assembled in a 6×6mm QFN package.

Typical Applications

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

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	2.7~3.5			GHz
RF1 Return Loss	—	-20	—	dB
RF2 Return Loss	—	-20	—	dB
Insertion Loss	—	-5.5	—	dB
IL Variation	—	±0.5	—	dB
Phase Accuracy	—	±3	—	°
RMS of Phase Accuracy	—	2	—	°
Amplitude Settling Time (50% cntl to +/- 0.1dB margin of final RFout)	—	100	—	ns
Phase Settling Time (50% cntl to +/-1 degree margin of final RFout)	—	100	—	ns

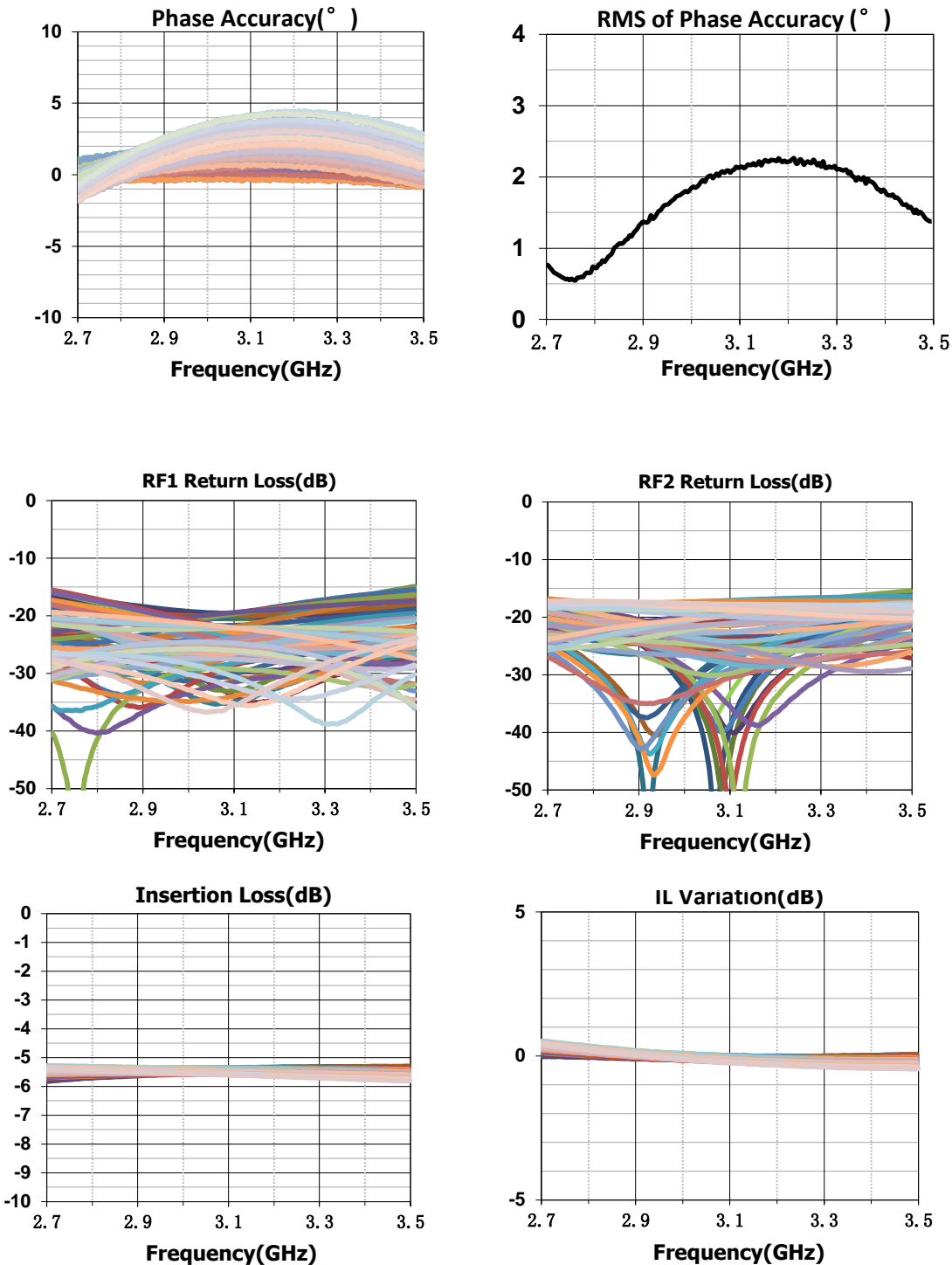
Truth Table (0 : 0V , 1 : +5V)

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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Typical Performance Curve



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Absolute Maximum Ratings

Maximum Input Power	+23dBm	Operating Temperature	-55°C~+85°C
Maximum Input Voltage	-8V	Storage Temperature	-65°C~+150°C

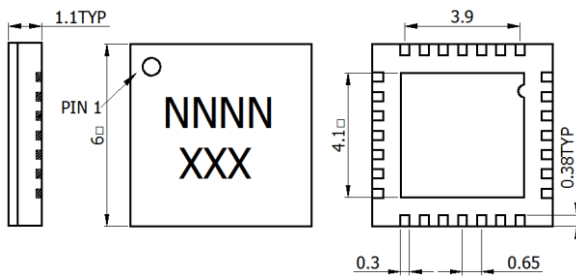
Control Voltage

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

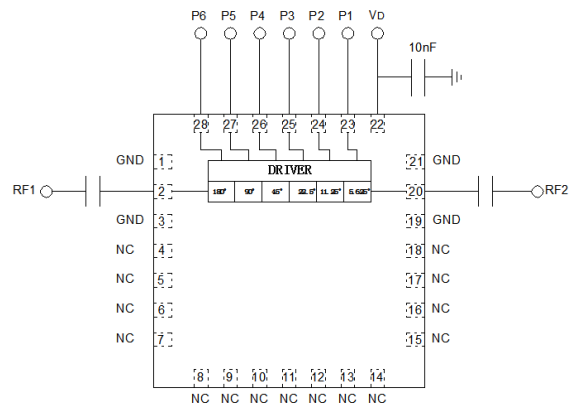
Power Supply

V _D	I _D
-5V	8mA

Outline Drawing (all dimensions in mm)



Assembly Diagram



Attention:

1. The moisture resistant grade of products is 2A, the storage environment $\leq 30^{\circ}$ 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.