

SAC3309Q6

GaAs MMIC 6-BIT DIGITAL PHASE SHIFTER
3.4~4.2GHz

Rev 1.2

Features

- Frequency: 3.4~4.2GHz
- RMS of Phase Accuracy: 1°
- Low Insertion Loss: 5.8dB
- Positive Voltage Control
- Size: 6mm×6mm×1.2mm

Typical Applications

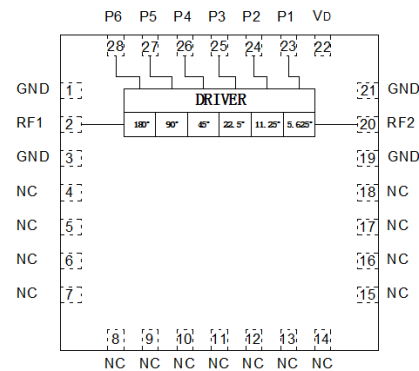
- EW
- Military Radar and Weather Radar
- SATCOM
- Beamforming Modules
- Phase Cancellation

General Description

SAC3309Q6 is a 6-bit digital phase shifter which works from 3.4 to 4.2GHz, providing 360 degrees of phase coverage with a LSB of 5.625 degrees.

SAC3309Q6 features very low RMS phase error of 1 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.

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	3.4~4.2			GHz
RF1 VSWR	—	1.3	1.8	:1
RF2 VSWR	—	1.3	1.8	:1
Insertion Loss	—	-5.8	—	dB
IL Variation	-0.2	—	0.7	dB
Phase Accuracy	-5	—	2.5	°
RMS of Phase Accuracy	—	1	—	°

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

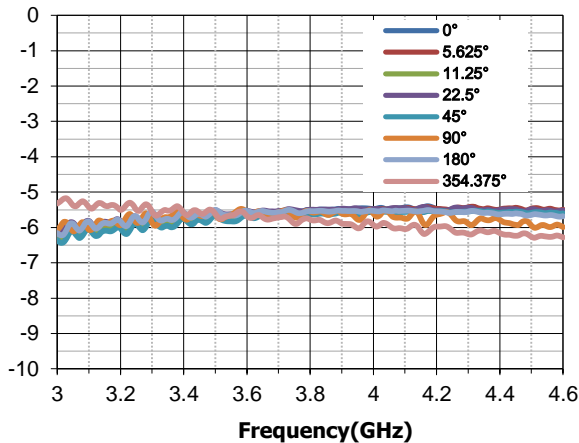
State	Bias
Low	0~0.2V
High	4.5~5.5V

Power Supply

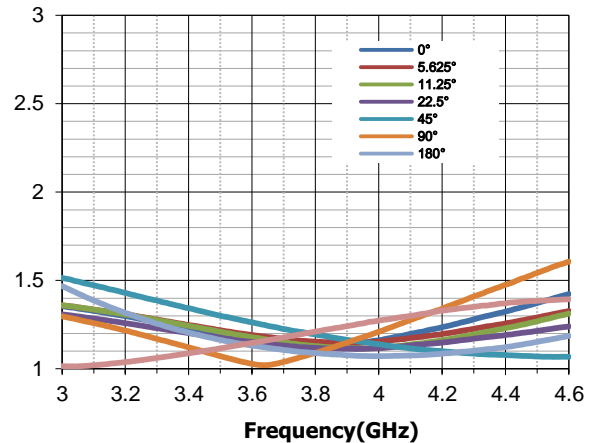
V _D	I _D
-5V	8mA

Typical Performance Curve

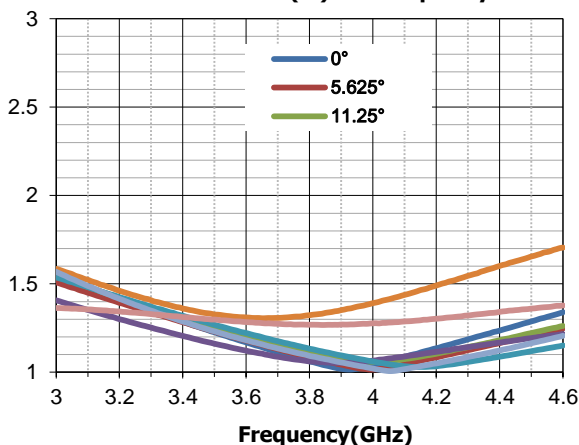
Insertion Loss (dB) vs. Frequency



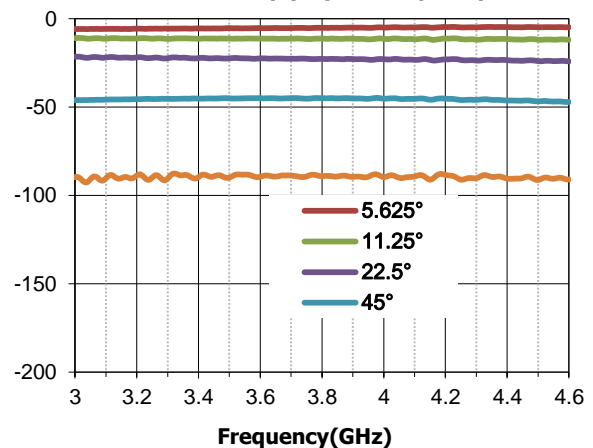
VSWR RF1(:1) vs. Frequency



VSWR RF2(:1) vs. Frequency



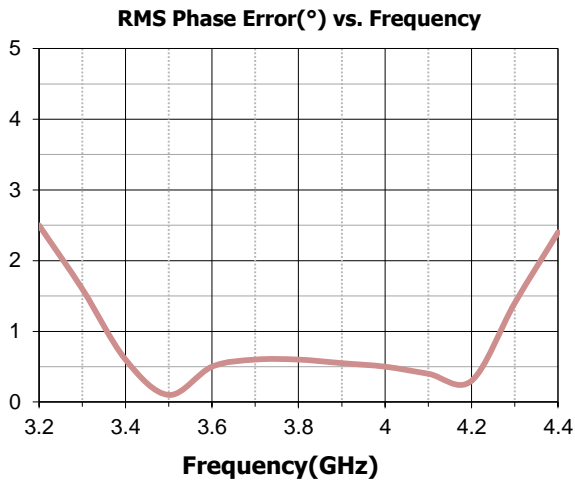
Phase Accuracy (dB) vs. Frequency



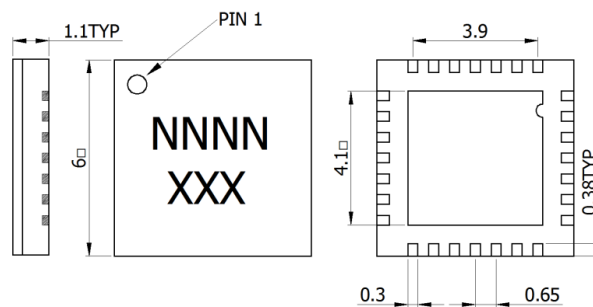
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Outline Drawing (all dimensions in mm)



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.