

SAC3312Q6

GaAs MMIC 6-BIT DIGITAL PHASE SHIFTER
2.0~3.2GHz

Rev 1.3

Features

- Frequency: 2.0~3.2GHz
- RMS of Phase Accuracy: 3.5°
- Low Insertion Loss: 8dB
- Positive Voltage Control
- Size: 6mm×6mm×1.2mm

General Description

SAC3312Q6 is a 6-bit digital phase shifter which works from 2 to 3.2GHz, providing 360 degrees of phase coverage with a LSB of 5.625 degrees.

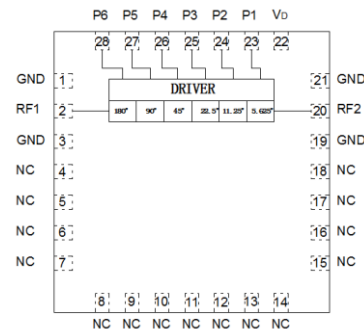
SAC3312Q6 features very low RMS phase error of 3.5 degrees and extremely low insertion loss variation of ±0.5dB across all phase states. This high accuracy phase shifter is controlled with positive control voltage of 0/+5V.

The device is assembled in a 6mm x 6mm QFN plastic package.

Typical Applications

- EW
- Military Radar and Weather Radar
- SATCOM
- Beamforming Modules
- 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	2~3.2			GHz
RF1 Return Loss		-28		dB
RF2 Return Loss		-25		dB
Insertion Loss		-8		dB
IL Variation		±0.5		dB
Phase Accuracy		±8		°
RMS of Phase Accuracy		3.5		°
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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Absolute Maximum Ratings

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

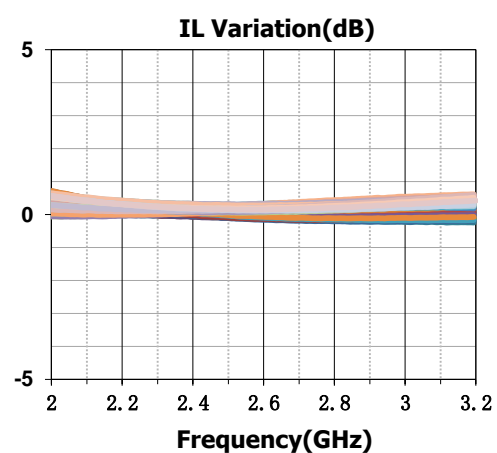
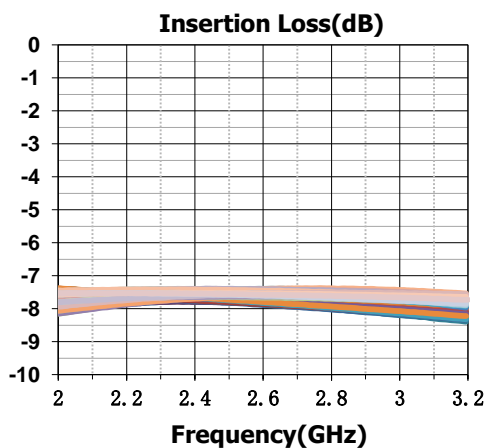
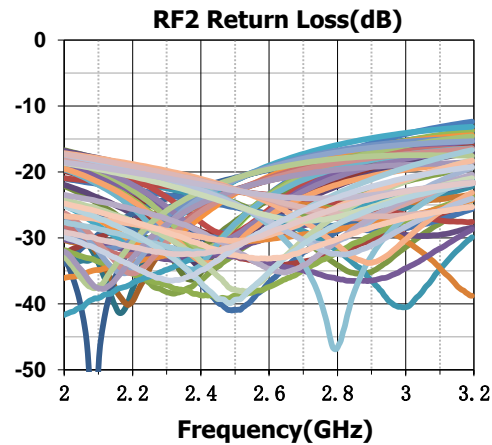
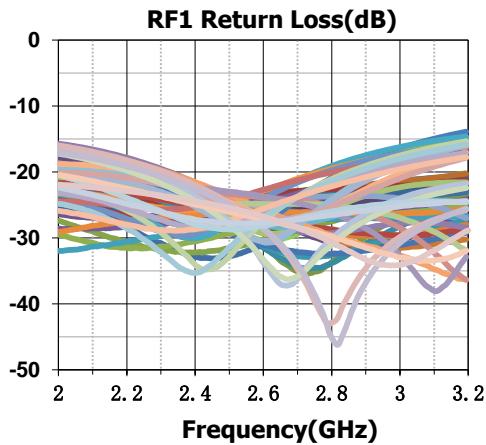
Control Voltage

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

Power Supply

V _D	I _D
-5V	8mA

Typical Performance Curve



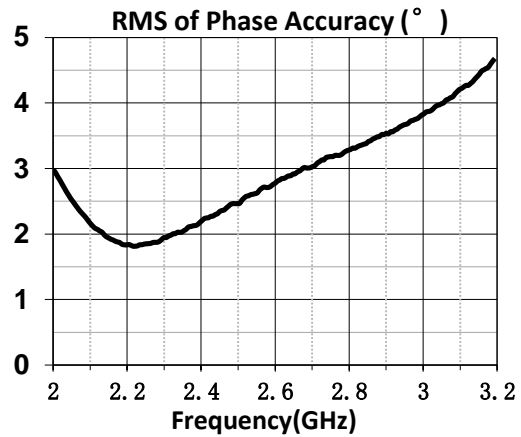
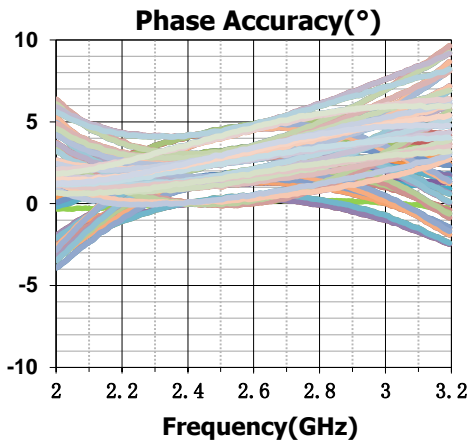
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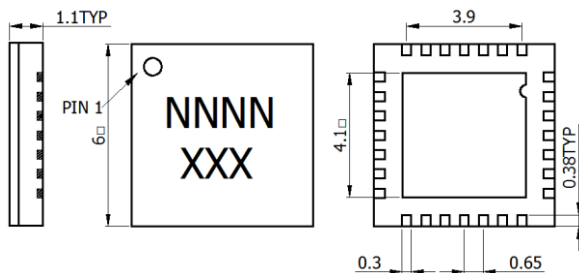
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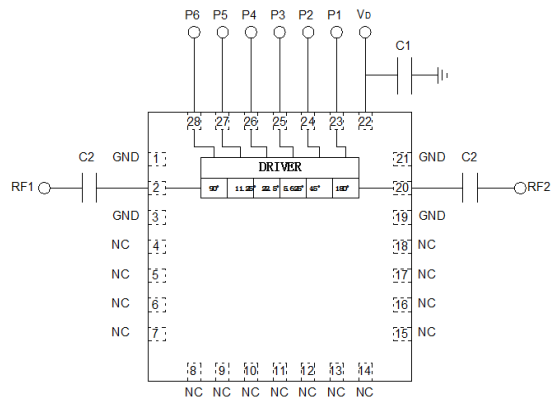
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Outline Drawing (all dimensions in mm)



Application Circuit



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1	10nF	GCM155R71H103KA55D	Murata	0402
C2	51pF	GCM1555C1H510FA16D	Murata	0402

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.