

SAC3306AQP5

GaAs MMIC 6-BIT DIGITAL PHASE SHIFTER
5~6GHz

Rev.1.0

Features

- Frequency: 5~6GHz
- RMS of Phase Accuracy: 3°
- Low Insertion Loss: -6dB
- Positive Voltage Control
- Size: 5mm×5mm×0.8mm

Typical Applications

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

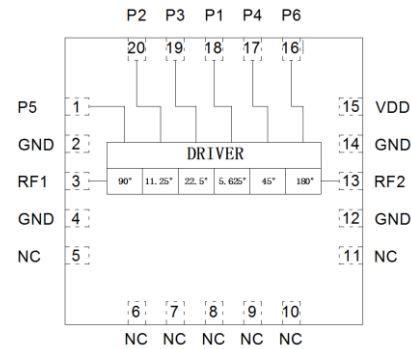
General Description

SAC3306AQP5 is a 6-bit digital phase shifter which works from 5 to 6GHz, providing 360 degrees of phase coverage with a LSB of 5.625 degrees.

SAC3306AQP5 features very low RMS phase error of 3 degrees and extremely low insertion loss variation of ± 0.8 dB across all phase states. This high accuracy phase shifter is controlled with positive control voltage of 0/+5V.

The device is assembled in 5×5mm of QFN package.

Functional Diagram



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

Parameter	Min.	Typ.	Max.	Units
Frequency		5~6		GHz
RF1 VSWR	—	1.4	—	:1
RF2 VSWR	—	1.4	—	:1
Insertion Loss	—	-6	—	dB
IL Variation	—	± 0.8	—	dB
Phase Accuracy	-8	-3	2	°
RMS of Phase Accuracy	—	3	—	°

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

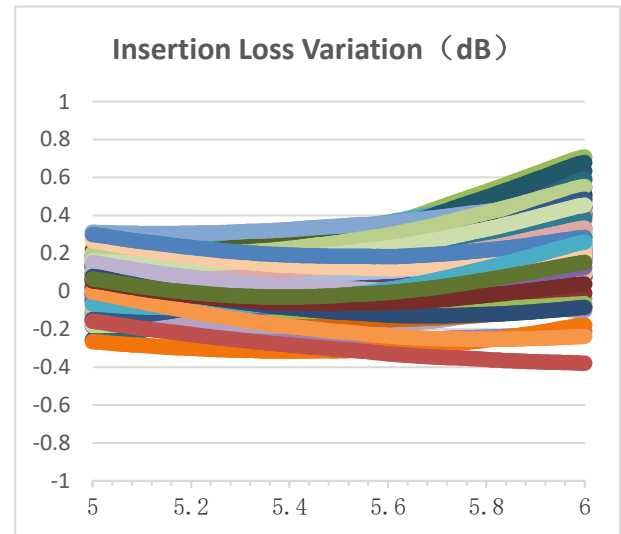
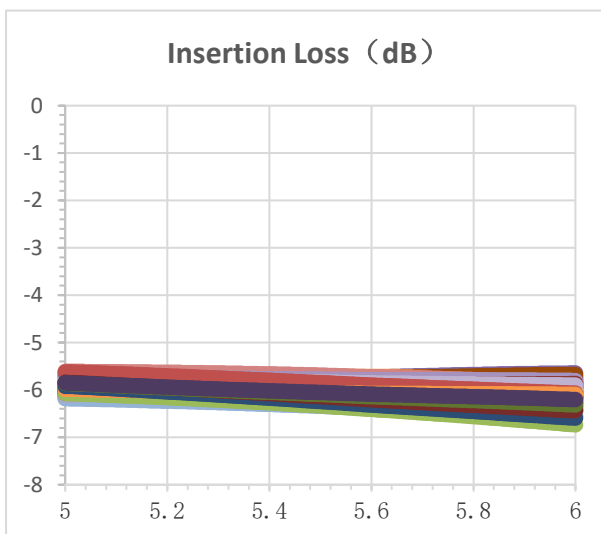
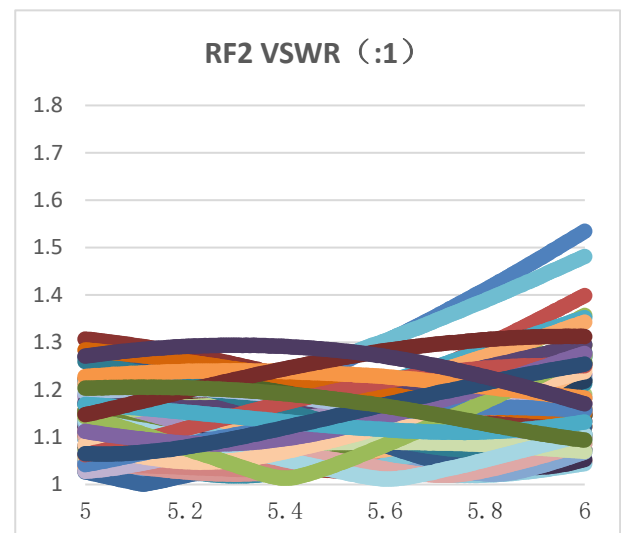
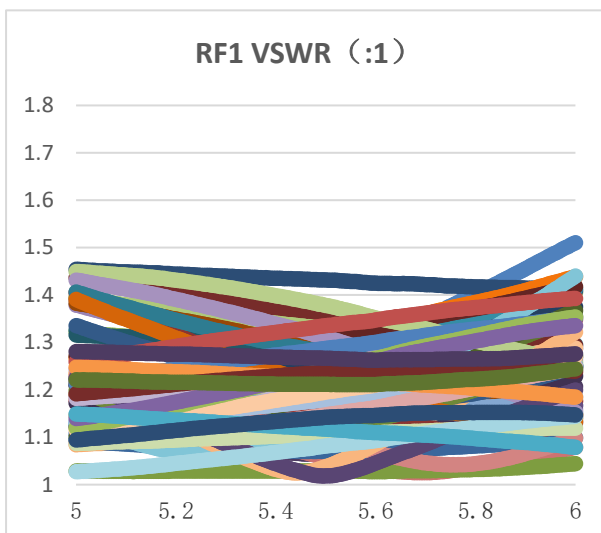
Control Voltage

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

Power Supply

V _b	I _b
-5V	8mA

Typical Performance Curve



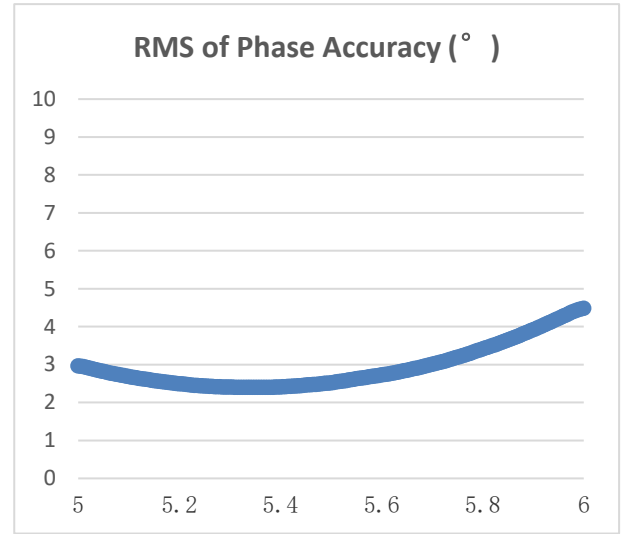
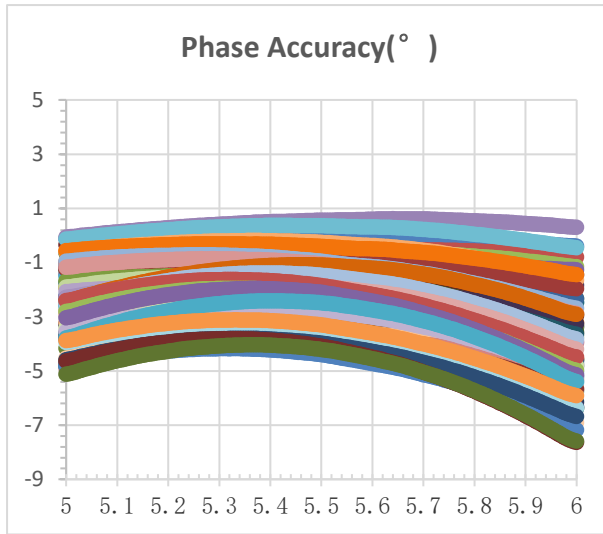
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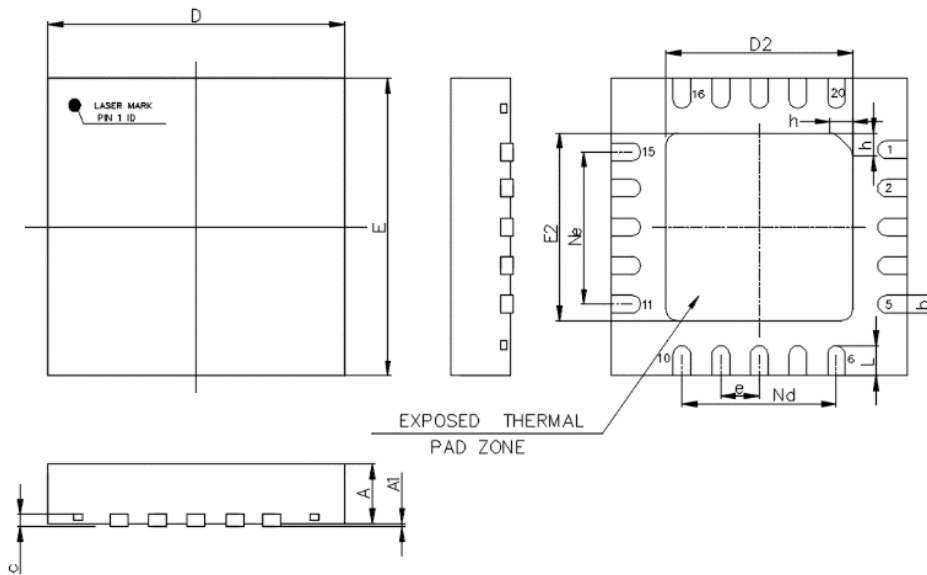
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Outline (All dimensions in mm)



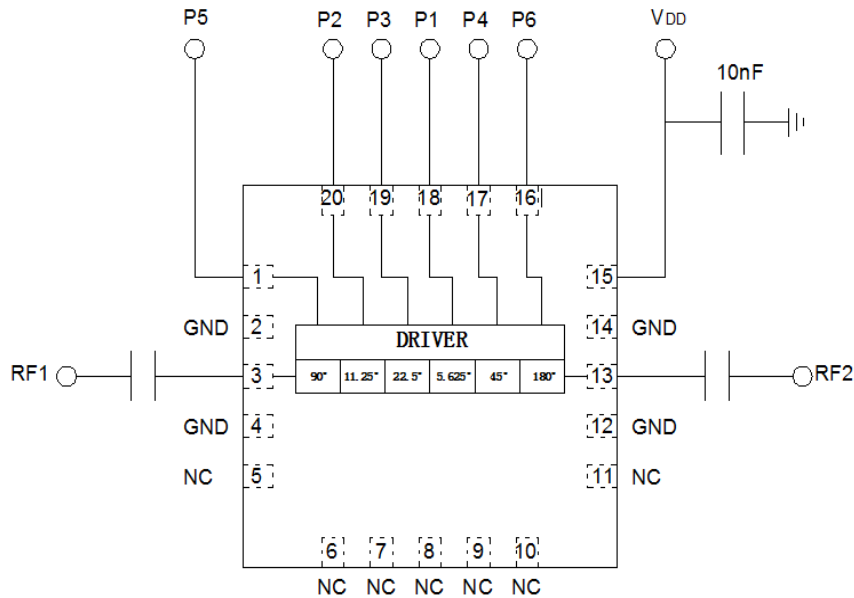
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	--	0.02	0.05
b	0.25	0.30	0.35
c	0.203REF		
D	4.90	5.00	5.10
D2	3.05	3.15	3.25
e	0.65BSC		
Ne	2.60BSC		
Nd	2.60BSC		
E	4.90	5.00	5.10
E2	3.05	3.15	3.25
L	0.45	0.50	0.55
h	0.25	0.30	0.35

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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 $125\pm 5^{\circ}\text{C}$ environment before soldering.