

SAC3601

GaAs MMIC Multifunction Chip
2.7~3.1GHz

Rev 2.0

Features

- Frequency Range: 2.7~3.1GHz
- RMS of Phase Accuracy: 0.8°
- RMS of Attenuation Accuracy: 0.08dB
- Insertion Loss: 3.5dB
- Positive Voltage Control
- Die Size: 3.1mm×1.25mm×0.1mm

Typical Applications

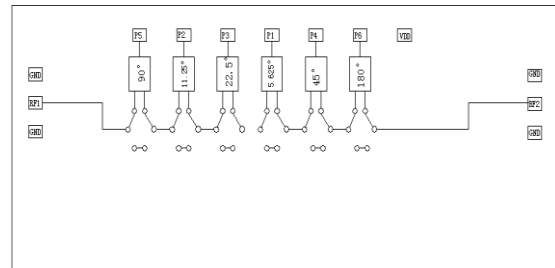
- EW
- Military Radar and Weather Radar
- SATCOM
- Beamforming
- Phase Shift

General Description

SAC3601 is S-band a core chip integrated with 4-bit phase shifter and 2-bit attenuator. The insertion loss is less than 3.5dB. All ports' VSWR is less than 1.2:1. The chip is powered by only +5V with 0/+5V being logic control voltages.

The chip offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=+25°C, V_D=+5V, Control Voltage=0/+5V, Z₀=-50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency	2.7~3.1			GHz
Phase-Input VSWR	—	1.2	—	: 1
Phase-Output VSWR	—	1.2	—	: 1
Phase-Insertion Loss	—	-3.5	—	dB
PHASE-Amplitude Error	-0.1	—	0.1	dB
Phase Accuracy	0	—	1	°
RMS of Phase Accuracy	—	0.8	—	°
A _{TT} - Input VSWR	—	1.18	—	: 1
A _{TT} - Output VSWR	—	1.18	—	: 1
A _{TT} -Insertion Loss	—	-3.5	—	dB
A _{TT} - Phase Error	-2.5	—	0.5	°
Attenuation Accuracy	-0.05	—	0.05	dB
RMS of Attenuation Accuracy	—	0.08	—	dB

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

Control Input		On-off State
SW1	SW2	RF_IN-RF_OUT
0	0	50 Ohm Load
1	1	ON

Phase Control Logic (0: 0V, 1: +5V)

Phase	P1	P2
REF	0	0
-5.625°	1	0
-11.25°	0	1
-16.875°	0	0

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Attenuator Control Logic (0: 0V, 1: +5V)

Attenuation	B1	B2	B3	B4
REF	0	0	0	0
0.25dB	1	0	0	0
0.5dB	0	1	0	0
1.0dB	0	0	1	0
2.0dB	0	0	0	1
3.75dB	1	1	1	1

Absolute Maximum Ratings

Input Power	+23dBm	Operating Temperature	-55°C~+85°C
Control Voltage Range	0.5V~8V	Storage Temperature	-65°C~ +150°C

Logic Voltage

State	Bias
0	0~0.2V
1	4.5~5.5V

Bias voltage and Current

V _D	I _D
5V	3mA

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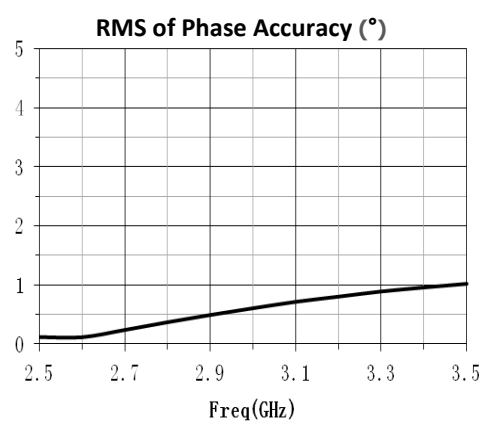
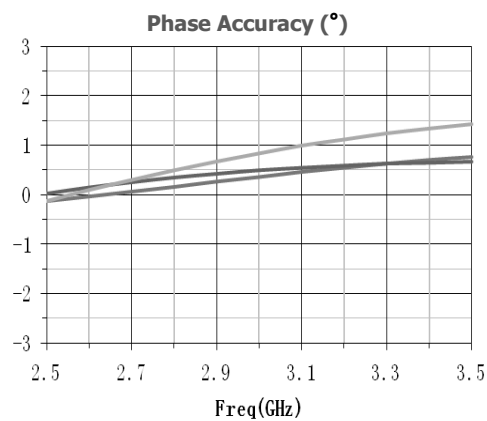
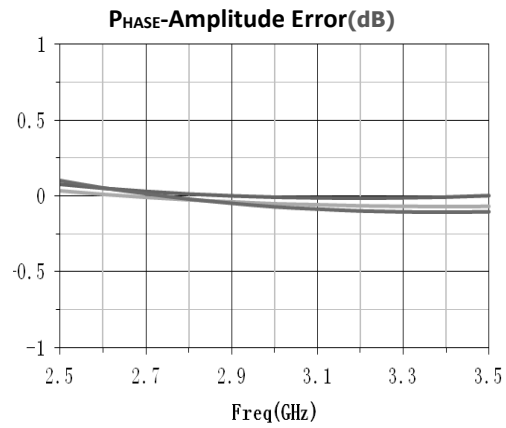
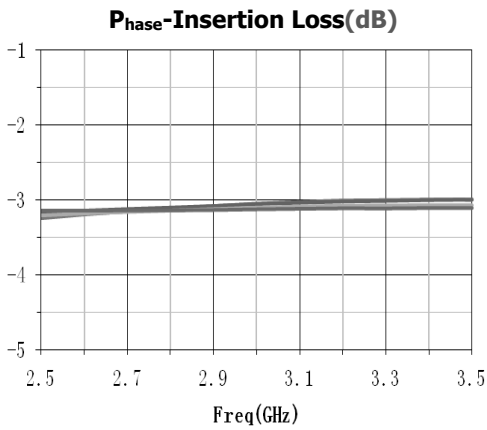
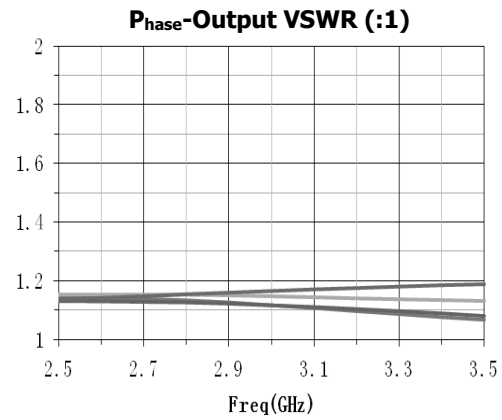
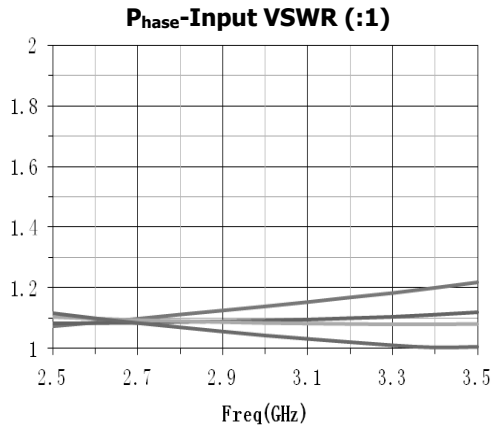


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Typical Performance Curve

1) Phase

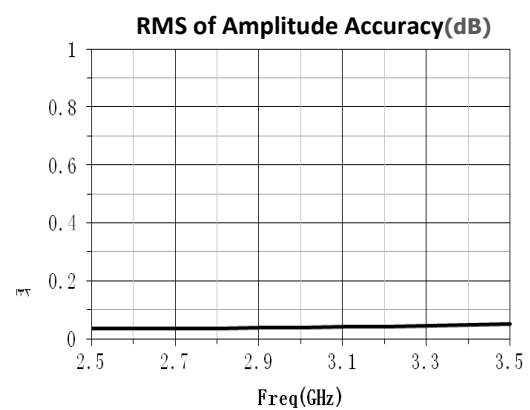
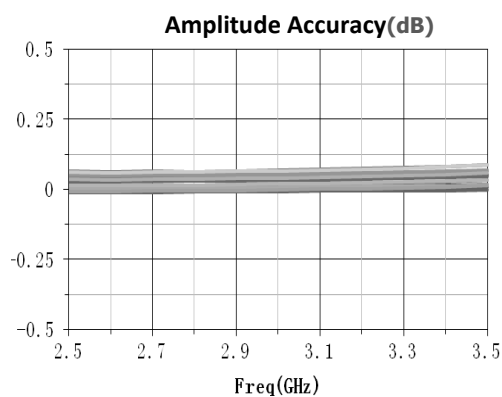
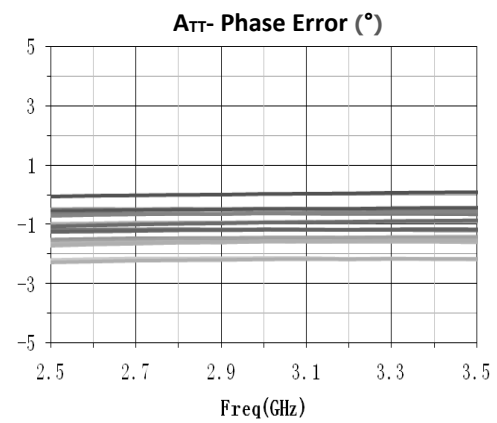
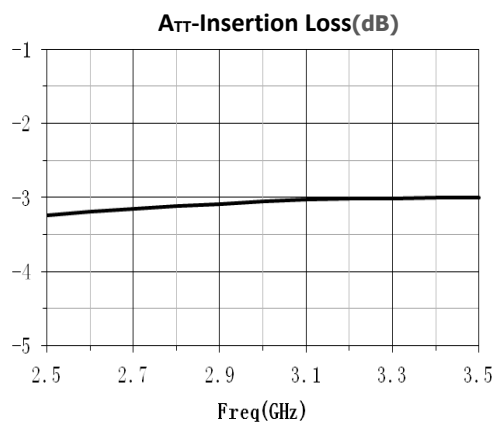
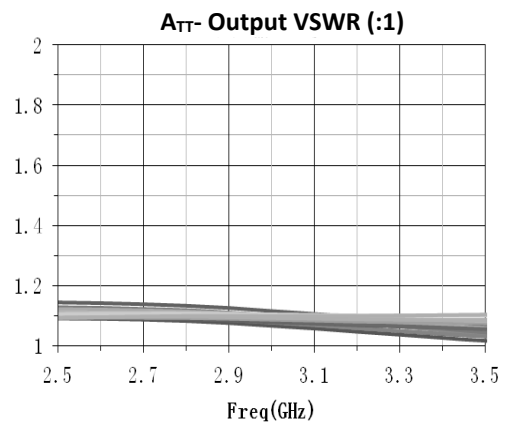
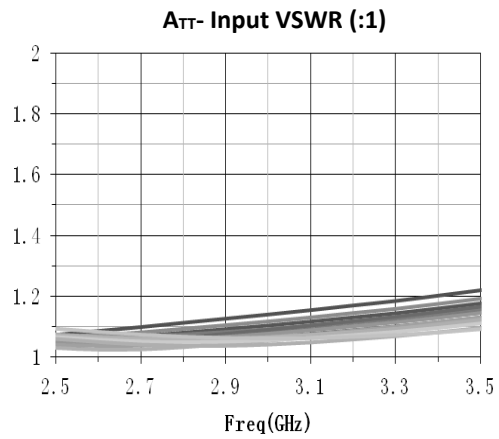


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2) Attenuation

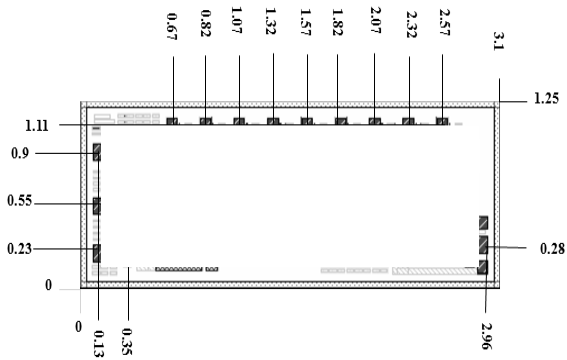


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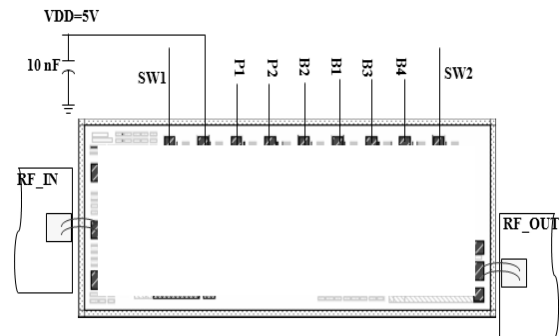
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Die Outline
(All dimensions in mm)



Assembly Diagram



Attention:

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.