

Features

- Frequency Range: 8~12GHz
- RMS of Phase Accuracy: 2.5°
- RMS of Attenuation Accuracy: 1.0dB
- Transmit /Receive State Gain: 1.5dB
- Die Size: 5.0mm×3.5mm×0.1mm

Typical Applications

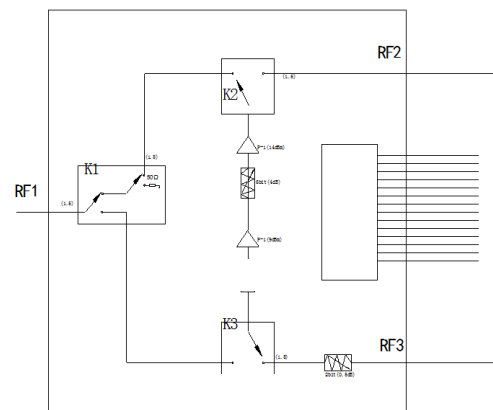
- Microwave radio including point to point communication
- Telecommunication
- Weather radar
- Optical communication
- Test instrumentation
- SatCom
- VSAT
- Military and Aerospace

General Description

SAC3613 is X-band transceiver Multifunction Chip integrated with 6-bit digital control phase shifter, 6-bit digital control attenuator, amplifier and Switch.

The chip offers full passivation for increased reliability and moisture protection. This amplifier is the perfect alternative to higher cost hybrid amplifiers.

Functional Diagram



Electrical Performance

($T_A = +25^\circ\text{C}$, $V_{d1} = 5\text{V}$, $V_s = -5\text{V}$, Control Voltage = 0/+5V, $Z_0 = 50\Omega$)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8~12			GHz
Transmit State Gain	—	1.5	—	dB
Attenuator Range	0.5	—	31.5	dB
RMS of Attenuation Accuracy	—	1.0	—	dB
A_{TT} - Phase Error	-6	—	4	°
Phase Shifter Range	5.625	—	354.375	°
RMS of Phase Accuracy	—	2.5	—	°
P_{PHASE} -Amplitude Error	—	±1.0	—	dB
Input VSWR	—	1.6	—	: 1
Output VSWR	—	1.7	—	: 1
TTL Control Voltage	—	0(0V)	1(+5V)	V
Amplifier Power Supply	—	90	100	mA
Drive Power Supply	—	10	20	mA
Storage Temperature	-55	—	75	°C

Absolute Maximum Ratings

Maximum Input Power	+23dBm	Operating Temperature	-55°C~+75°C
Maximum Input Voltage	8V	Storage Temperature	-65°C~+150°C

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

SW1	SW2	COM-TX	RX-COM	COM-Load
0	0	OFF	OFF	ON
0	1	OFF	ON	OFF
1	0	ON	OFF	OFF
1	1	ON	OFF	OFF

Phase Shifter Truth Table (0: 0V, 1: -5V)

Phase Shif	PC1	PC2	PC3	PC4	PC5	PC6
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

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

Attenuation	AC1	AC2	AC3	AC4	AC5	AC6
REF	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1dB	0	1	0	0	0	0
2dB	0	0	1	0	0	0
4dB	0	0	0	1	0	0
8dB	0	0	0	0	1	0
16dB	0	0	0	0	0	1
31.5dB	1	1	1	1	1	1

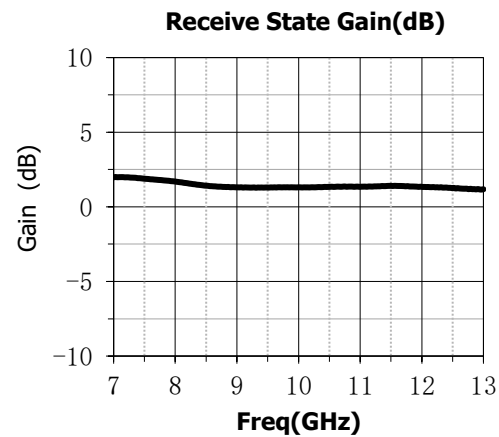
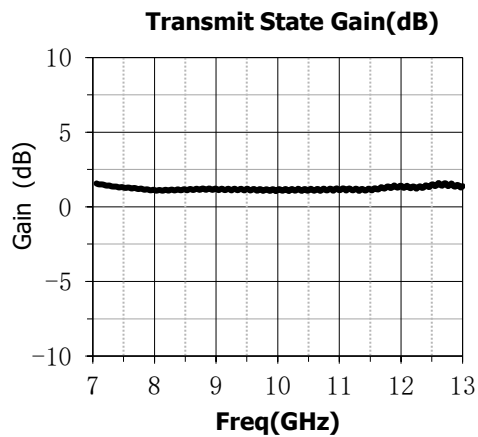
Control Voltages

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

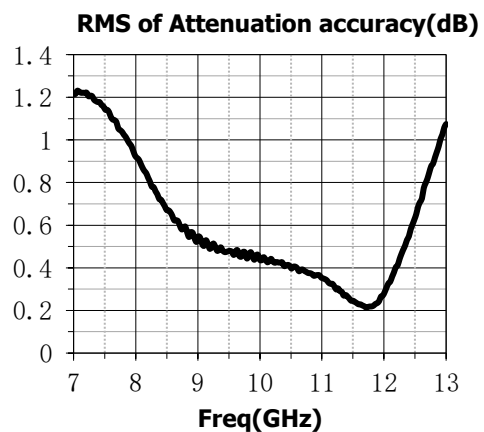
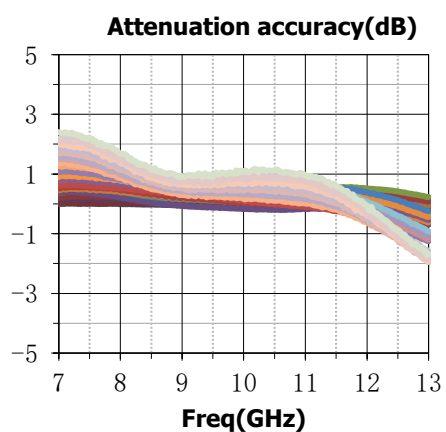
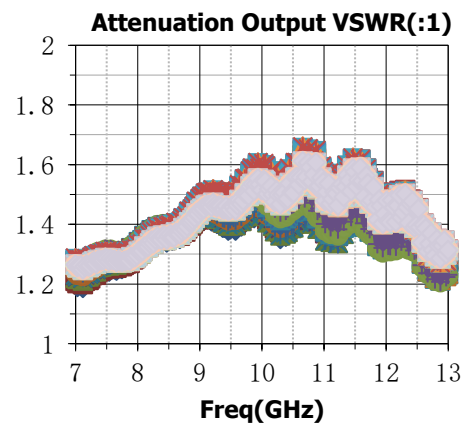
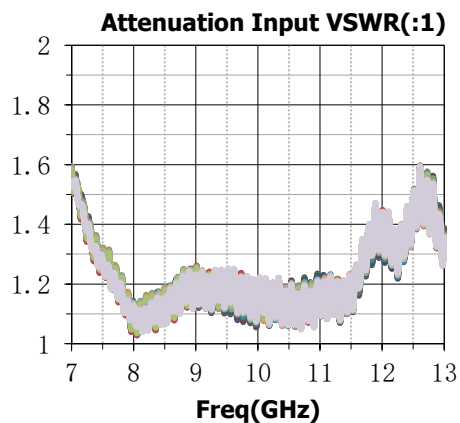
Bias Voltage & Current

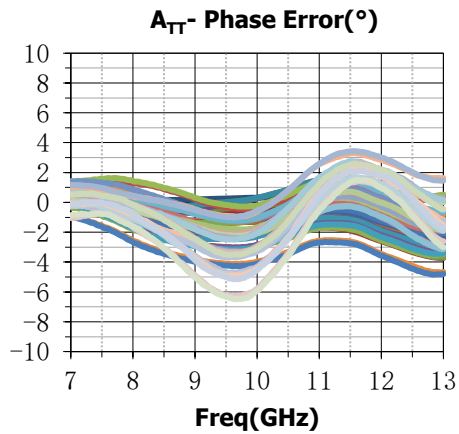
V _{d1}	I _{dd}	V _s	I _{ss}
5V	90mA	-5V	18mA

Typical Performance Curve (Bare chip test)

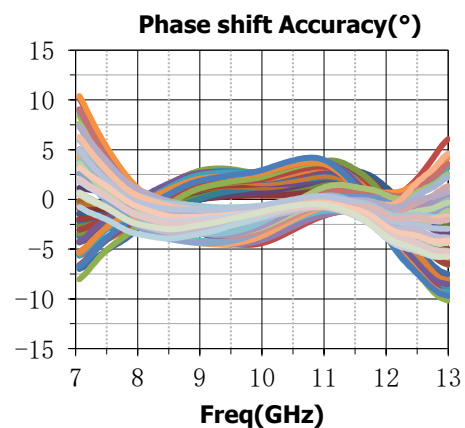
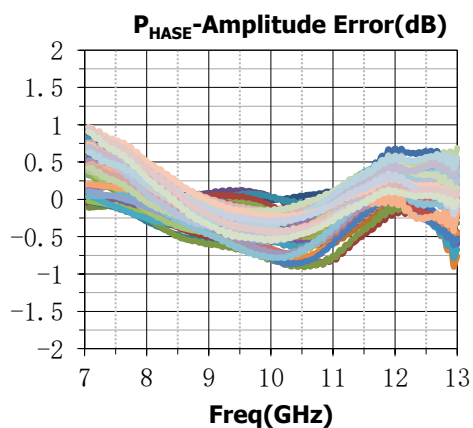
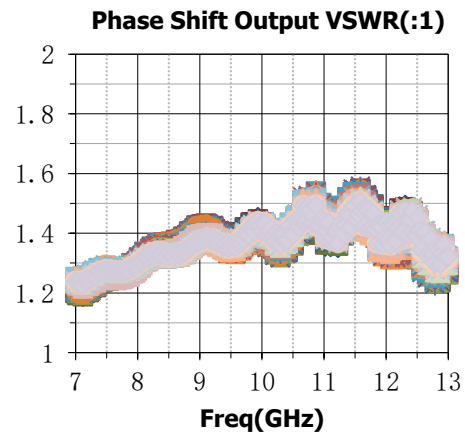
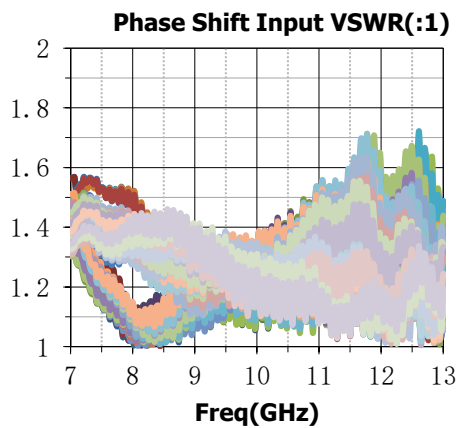


(1) Attenuator





(1) Phase Shift

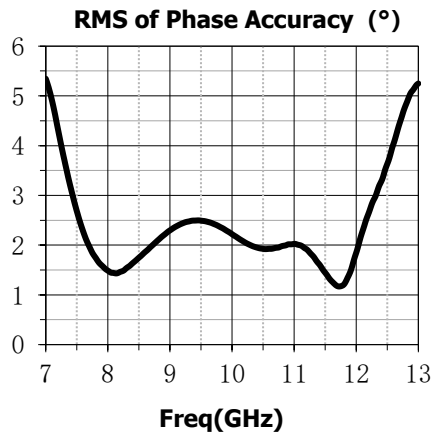


SAC3613

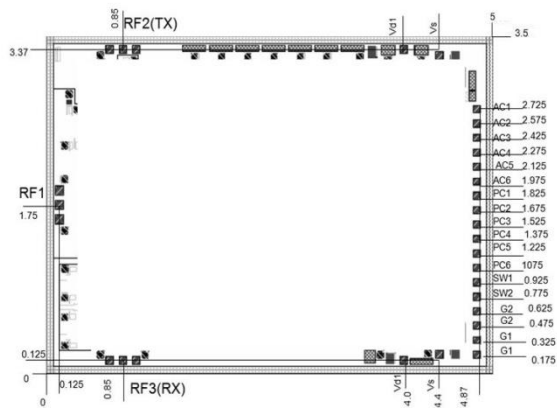


X-band Transceiver Multifunction Chip integrated with Phase Shifter, Attenuator
8~12GHz

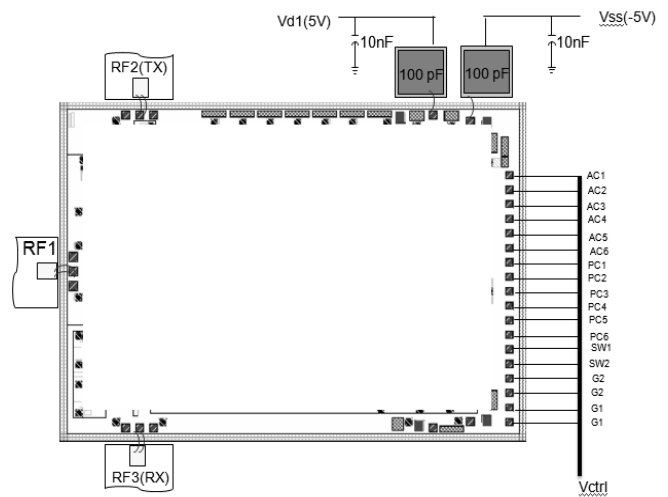
Rev 2.0



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.

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