

Features

- LO to RF Frequency: 2.5~5GHz
- IF Frequency: 0.65~1.5GHz
- Converter Gain: 16dB
- LO Power: 0dBm
- Die Size: 4mm×3.2mm×0.1mm

Typical Applications

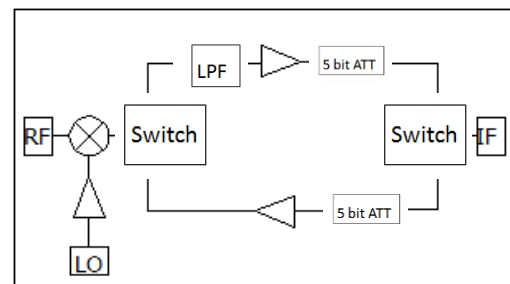
- EW
- Military Radar and Weather Radar
- SATCOM
- Beamforming
- Phase Shift

General Description

SAC3605 is a GaAs transceiver chip with Up-converter and Down-converter mixer function. It is integrated with RF bidirectional amplifiers, a LO drive amplifier, a double balanced mixer, switches, a low pass filter, and 3-bit digital controlled attenuators. It covers 2.5~5GHz RF and LO frequency range with IF frequency 0.65~1.5GHz. It generates 16dB conversion gain with typical 0 dBm LO input level.

The chip is back-metallized to ensure better grounding. It can be die-mounted with AuSn eutectic preform or with electrically conductive epoxy.

Functional Diagram



Electrical Performance

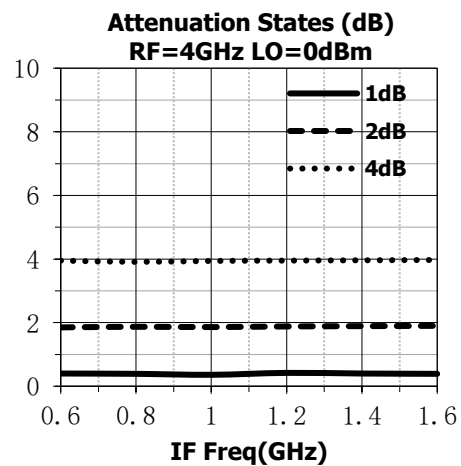
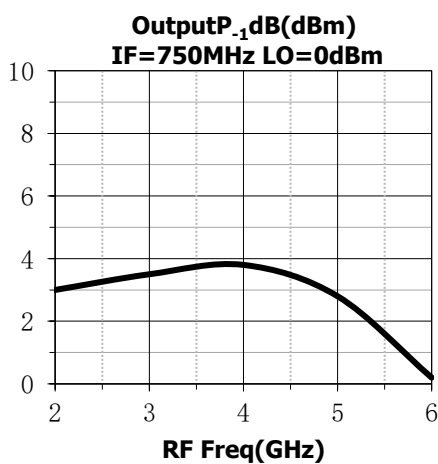
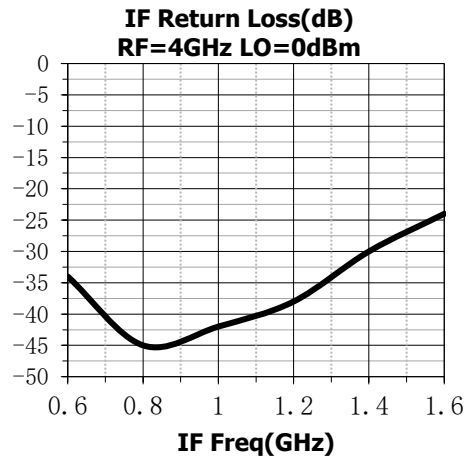
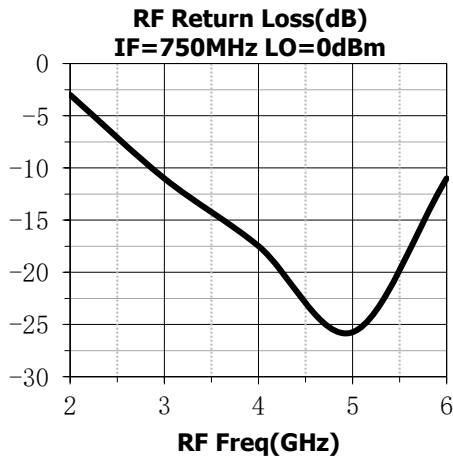
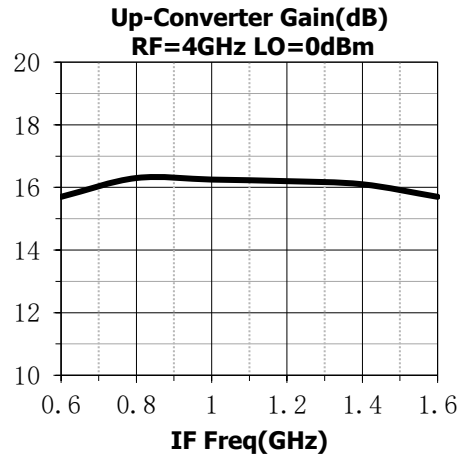
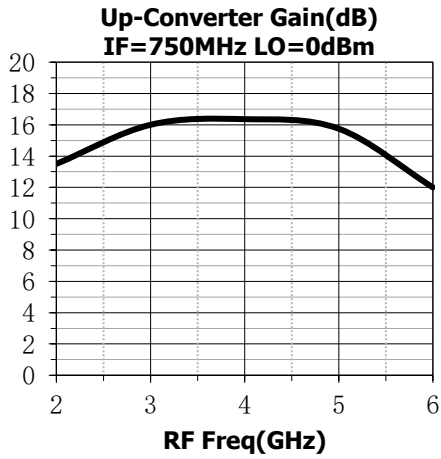
($T_A=25^{\circ}\text{C}$, $V_{DLO}=+5\text{V}$, $V_{DIFT}=+5\text{V}$, $V_{DIFR}=+5\text{V}$, $Z_0=50\Omega$)

Parameter	Min.	Typ.	Max.	Units
LO to RF Frequency	2.5~5.0			GHz
IF Frequency Range	0.65~1.5			GHz
Converter Gain	—	16	—	dB
Down-Converter OutputP _{-1dB}	14	—	—	dBm
LO to RF Isolation	—	-48	—	dB
Up-Converter OutputP _{-1dB}	3	—	—	dBm
Port Return Loss	—	-12	—	dB

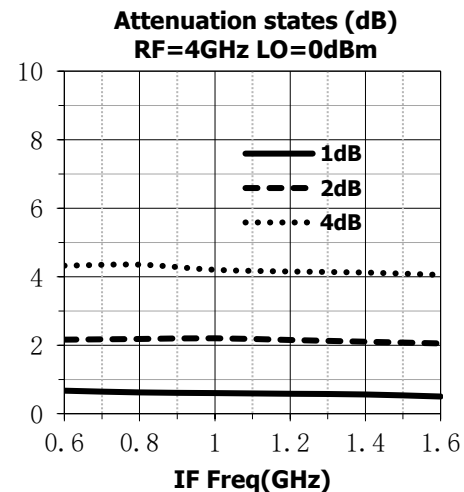
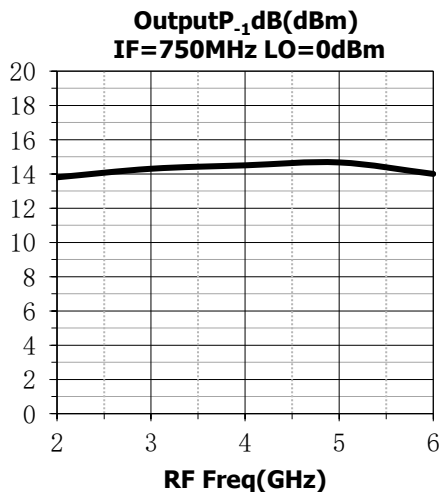
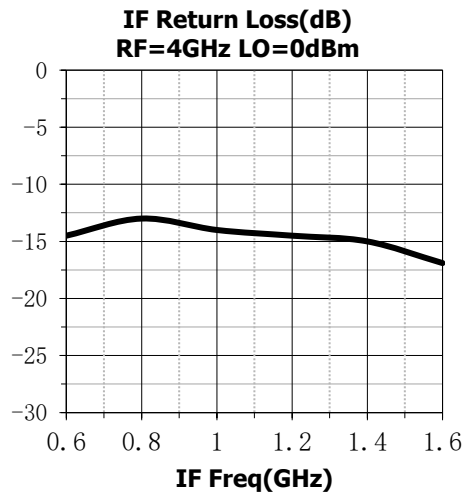
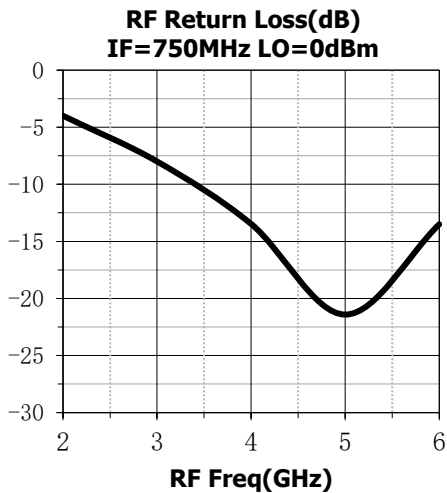
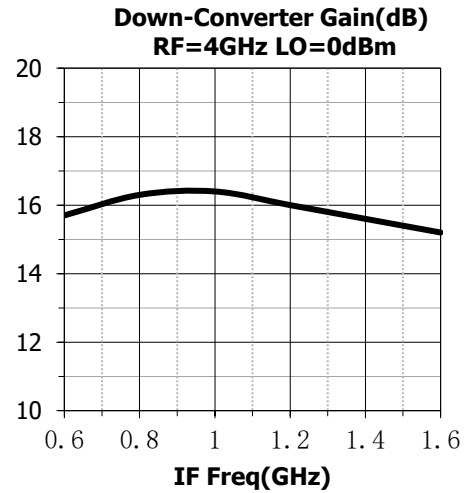
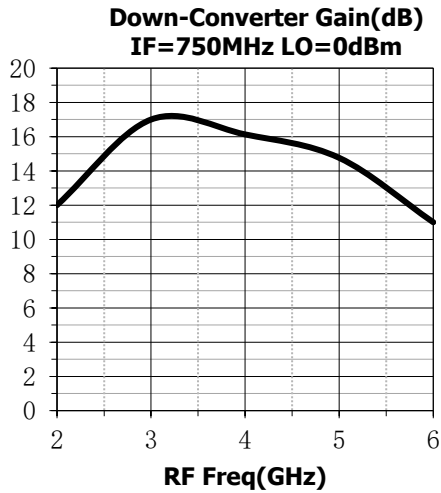
Absolute Maximum Ratings

RF Input Power	13dBm	Control Voltage Range	-5.5~0.5V
Channel Temperature	150°C	Storage Temperature	-65~+150°C
Operating Temperature	-55~+85°C	ESD protection level (HBM)	Class 1A

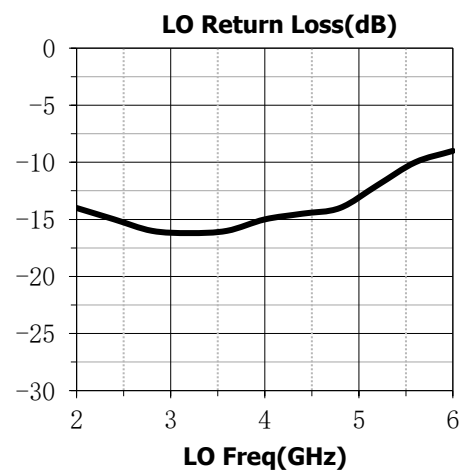
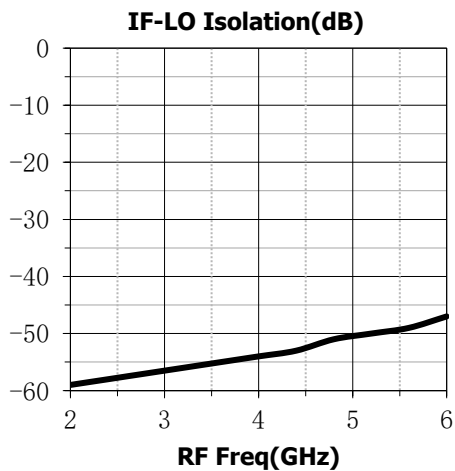
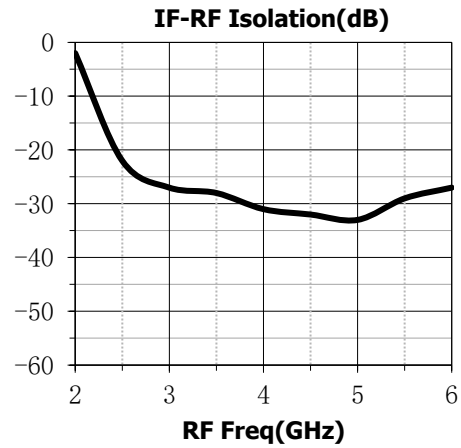
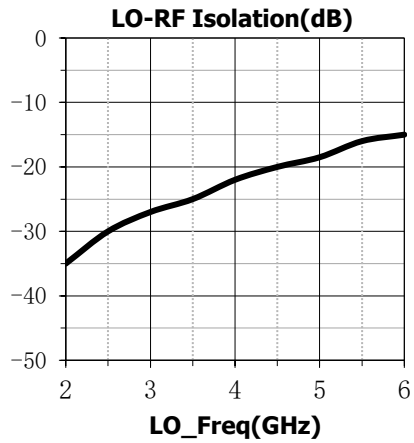
Typical Performance Curve (Up-Converter)



Typical Performance Curve (Down-Converter)



Typical Performance Curve (Isolation)



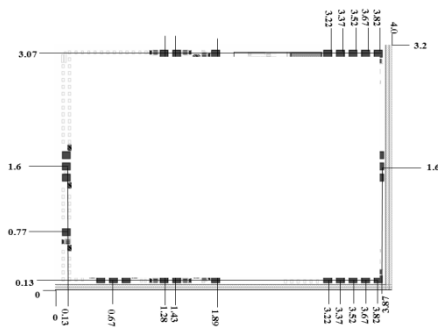
Attenuator Control Truth Table

	1A	2A	2B	3A	3B
REF	-5	0	-5	0	-5
1dB	0	0	-5	0	-5
2dB	-5	-5	0	0	-5
4dB	-5	0	-5	-5	0

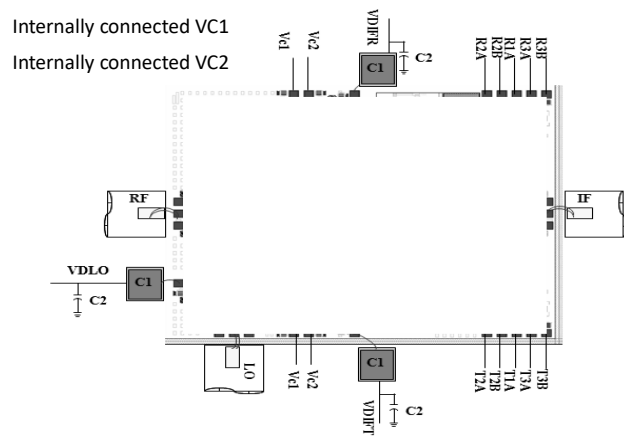
Function Control Logic

	VC1	VC2
Down conversion (RF-IF)	-5	0
Up conversion (IF-RF)	0	-5

Die Outline (All dimensions in mm)



Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1	100pF	—	RADVISTA	Chip
C2	10nF	GRM1857U1A103JA44	MURATA	0603

Attention:

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