

# SAC3503

GaAs MMIC Down-converter Mixer  
2.0~3.5GHz

Rev 2.3

## Features

- RF Frequency: 2.0~3.5GHz  
LO Frequency: **LSB**: 2.6~3.5GHz  
**USB**: 2.0~2.9 GHz
- IF Frequency: 10~600MHz
- Conversion Gain: 13dB
- Noise Figure: 6.5dB
- LO Power: +0dBm
- Supply Voltage: 85mA@5V
- Output P<sub>-1dB</sub>: +4.5dBm

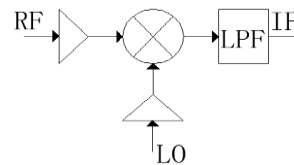
## Typical Applications

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

## General Description

SAC3503 is general-purpose down-converter. This MMIC mixer is fabricated in a GaAs process and requires no external components or matching circuitry.

## Functional Diagram



## Electrical Performance ( T<sub>A</sub>=25°C, LO=+0dBm, V<sub>D</sub>=+5V, LSB )

Parameter	Min.	Typ.	Max.	Units
RF Frequency Range	2.0~3.5			GHz
LO Frequency Range	2.6~3.5			GHz
IF Frequency Range	10~600			MHz
Conversion Gain	—	13	—	dB
Noise Figure	6.5			dB
Output P <sub>-1dB</sub>	—	3	—	dBm
RF Return Loss	—	-15	—	dB
IF Return Loss	—	-22	—	dB

## Electrical Performance ( T<sub>A</sub>=25°C, LO=+0dBm, V<sub>D</sub>=+5V, USB )

Parameter	Min.	Typ.	Max.	Units
RF Frequency Range	2.0~3.5			GHz
LO Frequency Range	2.0~2.9			GHz
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Conversion Gain	—	13	—	dB
Noise Figure	6.5			dB
Output P <sub>-1dB</sub>	—	3	—	dBm
RF Return Loss	—	-15	—	dB
IF Return Loss	—	-22	—	dB

## Absolute Maximum Ratings

Maximum RF Input	+10dBm	Operating Temperature	-55°C~+85°C
Maximum LO Input	+10dBm	LO Power	-3~+3dBm
Maximum Input Voltage	+8V	Storage Temperature	-65°C~+150°C

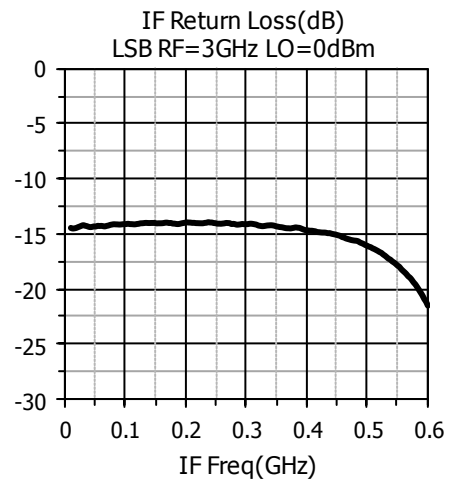
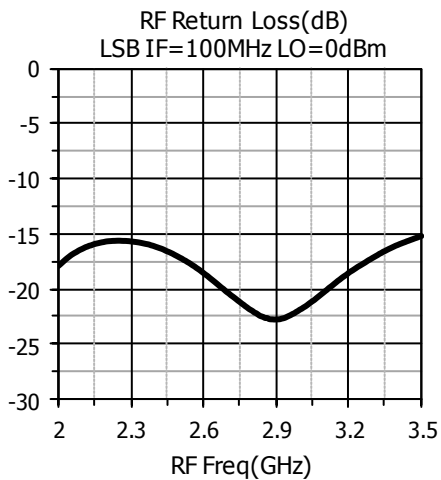
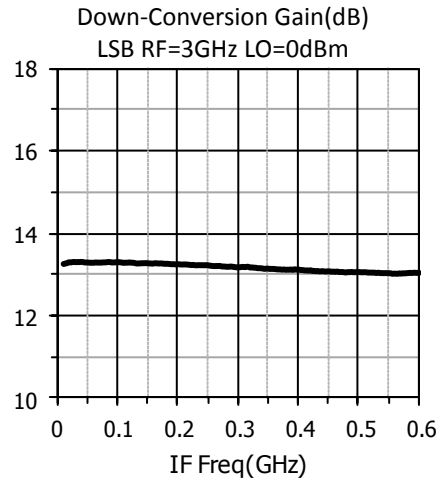
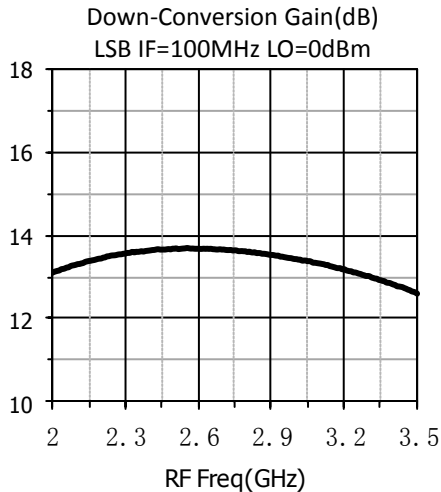
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## Electrical Performance ( $T_A=25^\circ\text{C}$ , $LO=+0\text{dBm}$ , $V_D=+5\text{V}$ )

Parameter	Min.	Typ.	Max.	Units
LO Frequency Range	2.0~3.5			GHz
LO to RF Isolation	—	-45	—	dB
LO to IF Isolation	—	-47	—	dB
RF to IF Isolation	—	-38	—	dB
LO Return Loss	—	-15	—	dB
Supply Current( $I_D$ )	—	85	—	mA

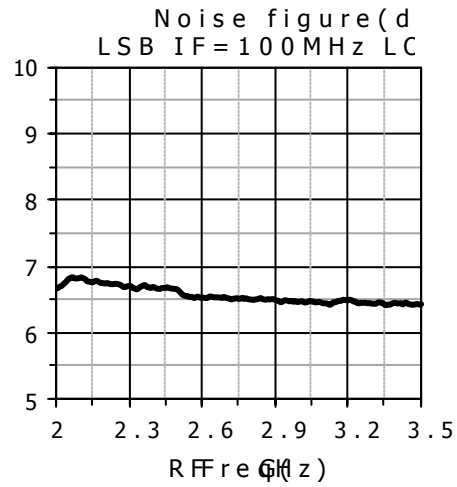
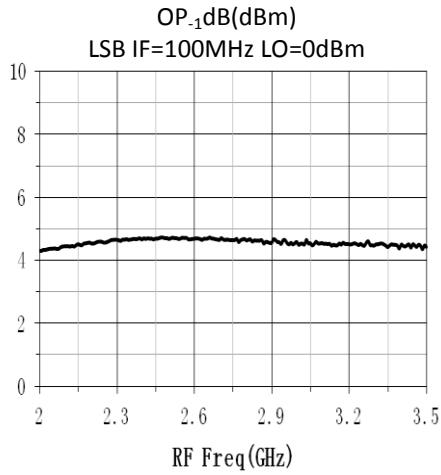
## Typical Performance Curve ( $RF < LO$ )



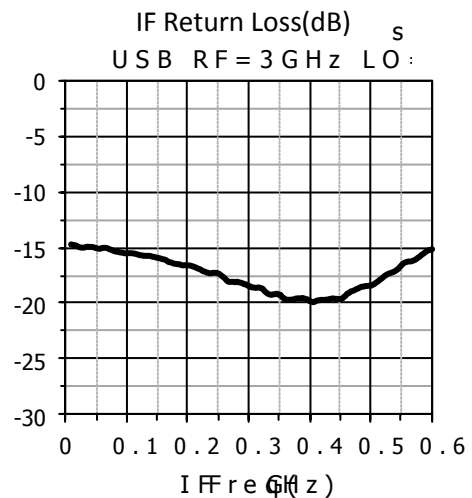
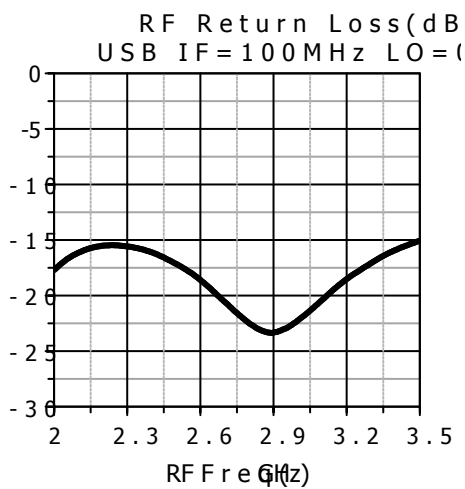
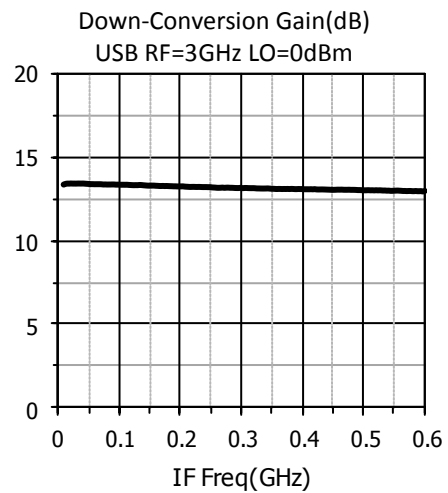
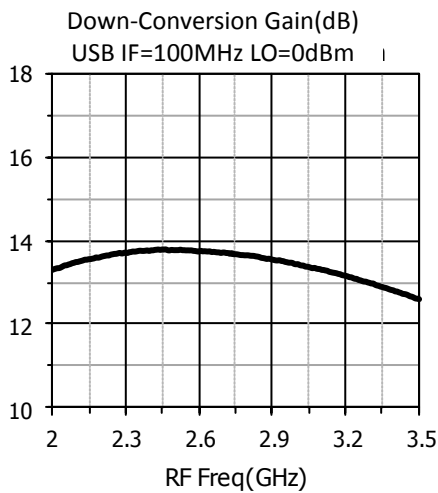
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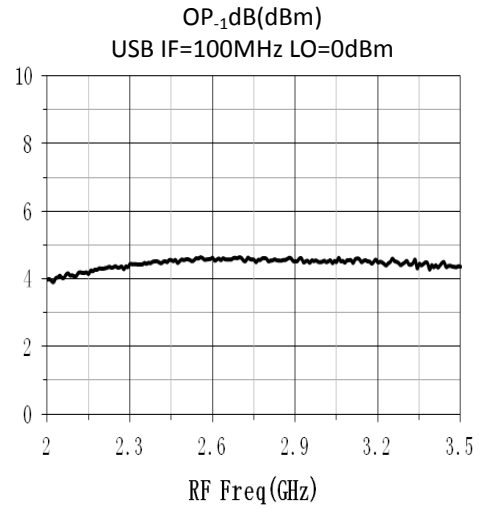
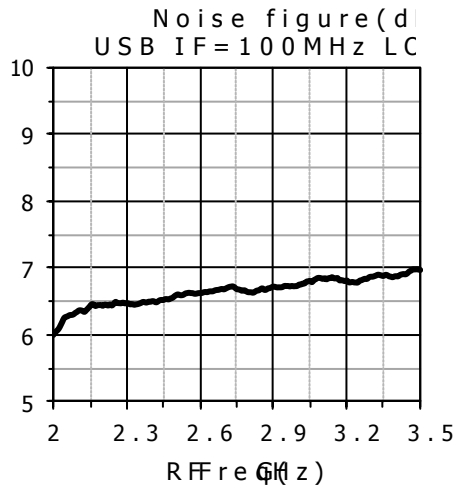
## Typical Performance Curve (RF>LO)



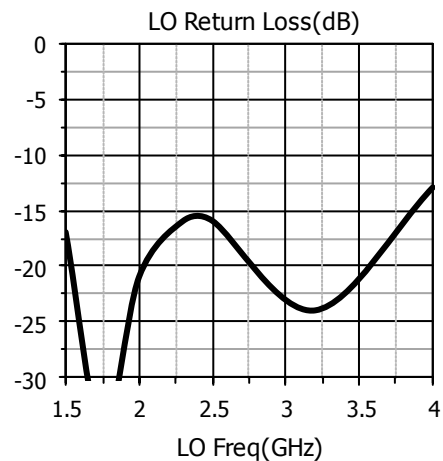
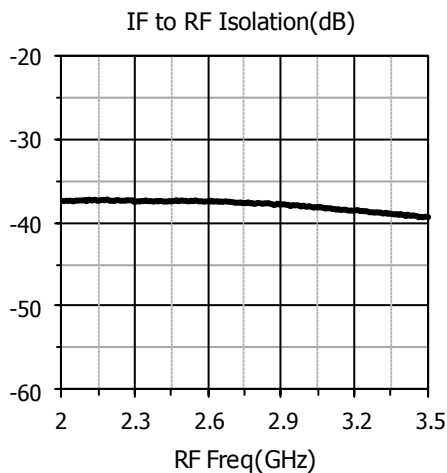
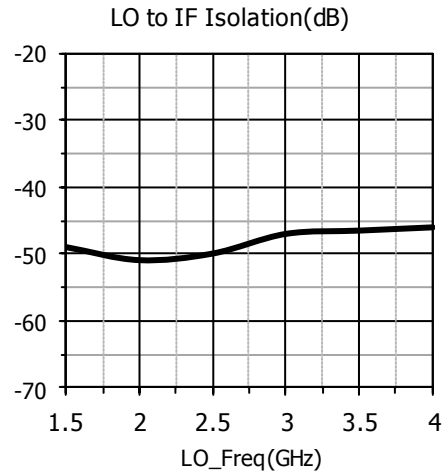
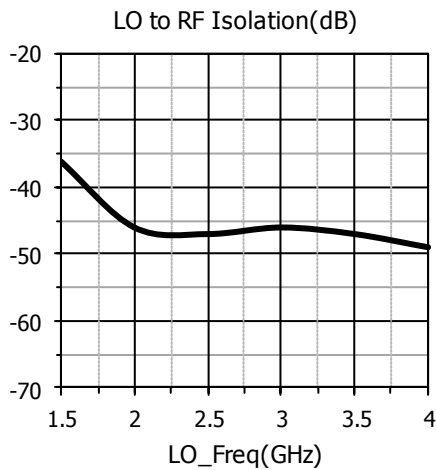
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## Typical Performance Curve (Isolation)

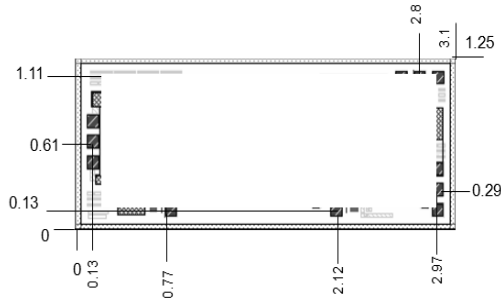


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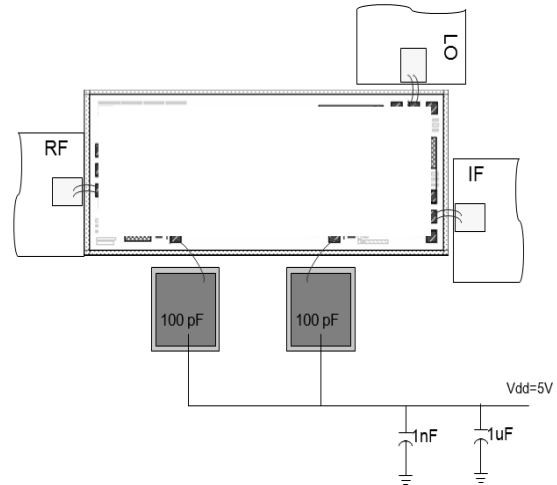
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**Die Outline**  
(all dimensions in mm)



**Assembly Diagram**



**Attention:**

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