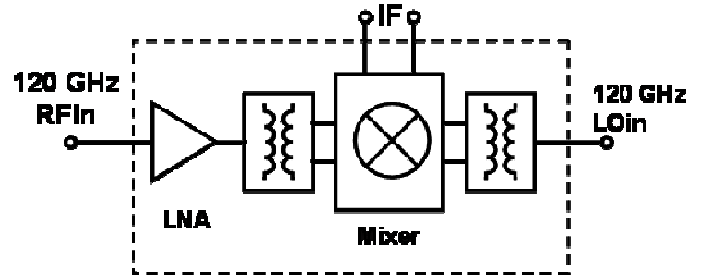


Overview

The IC is an integrated receiver circuit for the 122 GHz ISM-band in the frequency range 122.0 GHz – 122.5 GHz and for UWB-applications at frequencies in the 120GHz region with a bandwidth of up to ten GHz. It includes a low-noise-amplifier (LNA), one mixer and IF-buffers. The IC is fabricated in the IHP SiGe:C BiCMOS technology SG13 by using the bipolar transistors. The circuit is designed for on-wafer measurements and for PCB in flip-chip technology. This ensures minimized reflections in the transition from chip to the board.

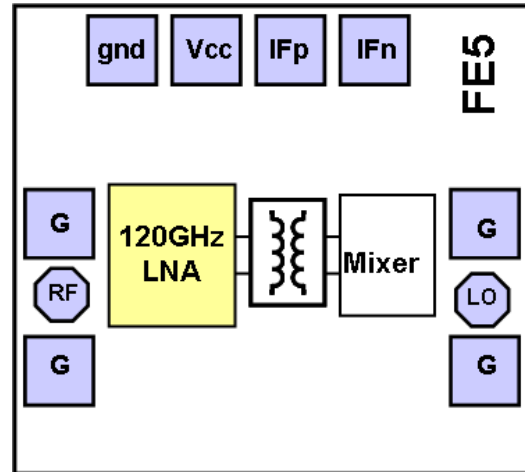
Circuit diagram



Applications

The main use of the receiver IC is in short range wireless communication systems and in radar systems for the ISM-band from 122.0 GHz to 122.5 GHz. It is intended for the use in ultrawideband systems with 10GHz bandwidth as well.

Pinout of the Chip

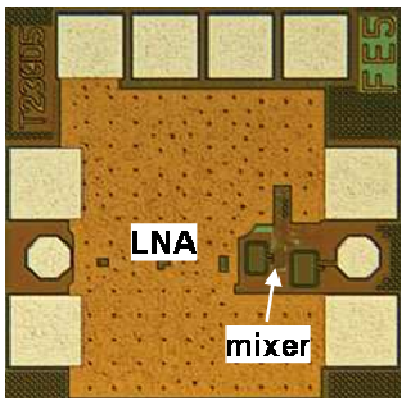


Characteristics

Parameter	Value
Supply voltage V_{CC}	3.3 V
Supply current I_{CC}	45 mA @ 3.3V
Chip size	560 x 600 μm^2
gain (DSB)	12dB
IF output impedance	470 Ω differential
NF (DSB)	< 12.7dB
Operating temp	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$

No.	Name	Description
1	gnd, G	Ground
2	Vcc	supply voltage
3	RF	RF input, 50 Ω
4	LO	LO input, 50 Ω
5	IFn, IFp	IF output (differential)

Chip Photo



Bonding to PC boards: Flip-chip technology is recommended for low loss because of low parasitic inductance

Measurement Results

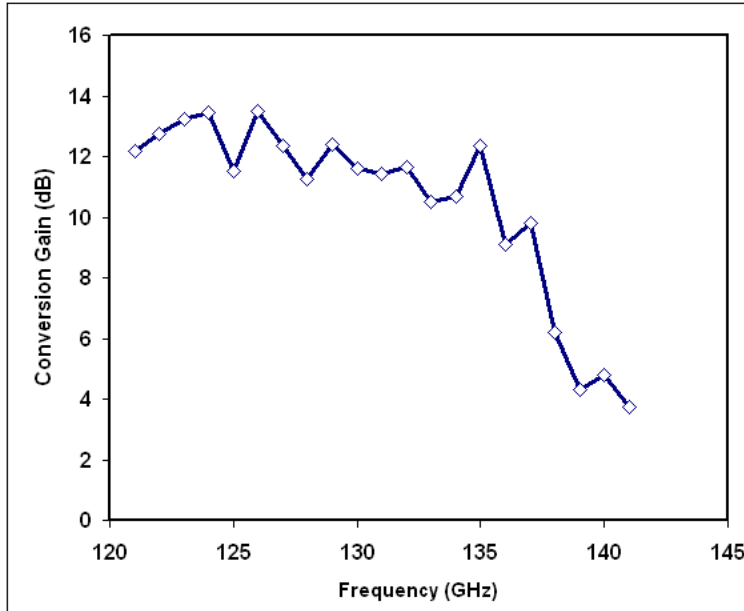


Figure 1: Gain over RF-frequency for constant IF-frequency of 1GHz

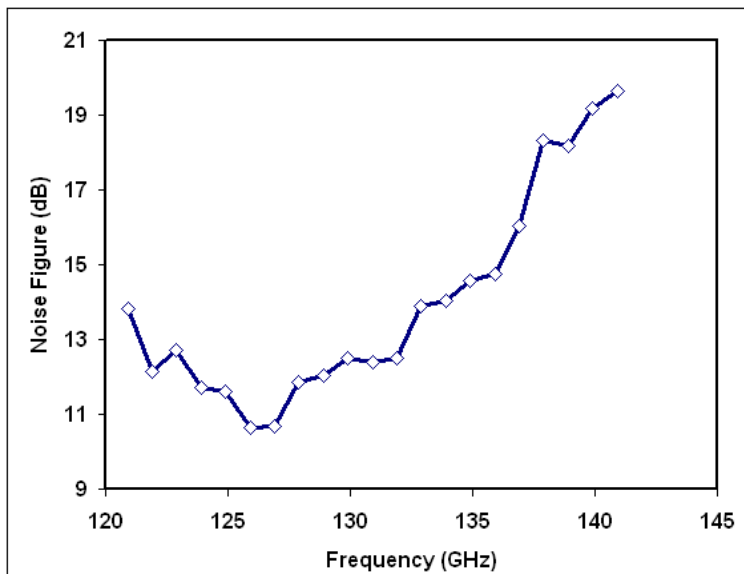


Figure 2: Noise figure over RF-frequency