

Overview

The circuit is a fully-integrated voltage controlled oscillator (VCO) for the 24 GHz ISM-band in the frequency range 24.0 GHz – 24.25 GHz and for UWB-applications. It is fabricated in the IHP SiGe:C BiCMOS technology SG25H3 by using the bipolar part for the oscillator core and the MOS-part for the varactor. The circuit is designed for the use in radar and communication systems. The circuit has low power consumption, a wide tuning range and low phase noise.

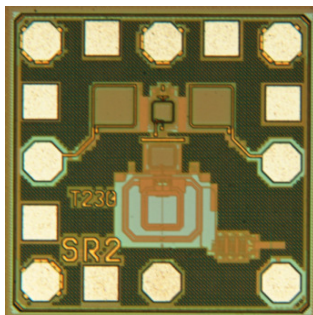
Applications

The main use of the VCO is in wireless communication systems and in radar systems for the ISM-band from 24.0 GHz to 24.25 GHz and for UWB-applications for frequencies 23.5-26 GHz

Characteristics

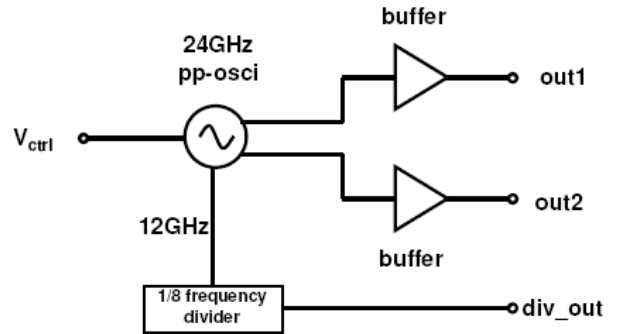
Parameter	24GHz VCO
Supply voltage V_{CC1}	3.0 V
Supply current I_{CC1}	78 mA
Supply voltage V_{CC2}	2.5 V
Supply current I_{CC2}	8 mA
Center frequency	24.125 GHz
Tuning range	3.2 GHz
Output power	2 x 4 dBm
Phase noise at 1MHz offset	-110 dBc/Hz
Chip size	800x800 μm^2
Operating temp	-40 °C to +105 °C

Chip photo



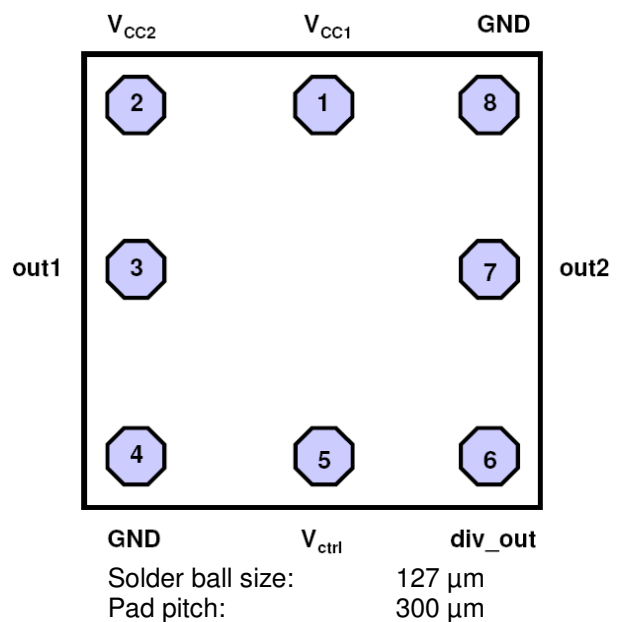
Chip photo w/o solder balls

Circuit diagram



Pinout of the Chip

No.	Name	Description
1	V_{CC1}	Supply voltage oscillator
2	V_{CC2}	Supply voltage of prescaler
3	out1	RF output 1
4	GND	Ground
5	V_{ctrl}	Control voltage for oscillation frequency 0-3V
6	div_out	output of frequency divider
7	out2	RF output 2 (= /out1)
8	GND	Ground



Measurement Results

