Abstract

The main focus of this paper is to design a voltage controlled oscillator (VCO) with the oscillation frequency of 2.4 GHz. A completely integrated LC-VCO, compatible with the ISM band is designed using 180 nm CMOS technology and with supply voltage of 1.8 V. The inductor-capacitor (LC) tank uses varactors as tuning elements. The n-type metal-oxide-semiconductor (NMOS) cross-coupled topology is adopted in this design. Simulation is done using HSPICE and performance results are reported. By the measurement results, the designed VCO showed a phase noise of -91 dBc/Hz. By varying the control voltage from 0 to 1.8 V, the tuning range obtained is 300 MHz. The output frequency of the VCO can be varied from 2.21197 GHz and 2.51061 GHz, and can be applicable to 2.4 GHz Bluetooth/WLAN/Zigbee/Wi-Fi applications. In this paper, the designed LC-VCO aims to achieve low phase noise, low power consumption.

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