Abstracts

A bond-wire inductor-MOS varactor VCO tunable from 1.8 to 2.4 GHz

F. Svelto and R. Castello. "A bond-wire inductor-MOS varactor VCO tunable from 1.8 to 2.4 GHz." 2002 Transactions on Microwave Theory and Techniques 50.1 (Jan. 2002, Part II [T-MTT] (Special Issue on Silicon-Based RF and Microwave Integrated Circuits)): 403-407.

This paper presents a technique that optimizes LC-tank CMOS voltage-controlled oscillators (VCOs) by minimizing the product of phase noise and power consumption. Moreover, it shows that the minimum depends on the tank's quality factor Q, the device noise coefficient /spl gamma/, and the ratio between the maximum oscillation amplitude and supply voltage /spl alpha/. Prototypes, realized in a 0.35-/spl mu/m process, show the following performances: -122.5 dBc/Hz at 600 kHz from a 1.9-GHz carrier, with 2-V supply voltage and 1-mA current consumption. The VCO can be tuned between 1.8-2.4 GHz, when the varactor control voltage is varied between 0-3.5 V. In the proposed realization, the tank is made of a metal-oxide-silicon varactor (operated between accumulation and deep depletion) and a bond-wire inductor, realized connecting two pads to a package frame lead to be compatible with the production environment.

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