

A low-power current bleeding mixer with improved LO-RF isolation for ZigBee application

ABSTRACT

This paper presents a low power current bleeding CMOS mixer with high LO-RF isolation for ZigBee application. The proposed mixer uses current reuse technique with self-biased transconductance stage to increase the conversion gain while substantially reducing the DC power dissipation. A NMOS current bleeding transistor and load resistor is integrated between the RF transconductance and LO switching stage to improve the LO-RF isolation. This mixer is verified in 0.13 μm standard CMOS technology. The simulation result shows a high conversion gain (CG) of 12 dB, 1 dB compression point (P1dB) of -13.4 dBm, third-order intercept point (IIP3) of -4.3 dBm and a noise figure (NF) of 15.45 dB. The circuit consumes 664 μA current from 1.2 V power supply and LO-RF isolation is improved by 25 dB.

Keyword: Mixer; Current-reused; LO-RF isolation; CMOS; Conversion gain; ZigBee