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Abstract
A wireless LAN application of 5.2GHz RF front-end fabricated in a 0.18μm CMOS technology of TSMC is proposed in this thesis. The RF front-end includes a low noise amplifier (LNA), a mixer and a voltage controlled oscillator (VCO). The advantages of the LNA are low noise, high gain and low power consumption and the advantages of the mixer are high linearity and high isolation. As for the VCO, it has a virtue of stable oscillation so as to boost the performance of the whole RF front-end.

The LNA has a S11 less than —23dB, S22 less than —16dB, gain of 12dB, noise figure of 3.4dB, P1dB of —16dBm, IIP3 of —7.5dBm. The mixer has a S22 less than —21dB, conversion gain of —1dB, P1dB of —17dBm, IIP3 of —8dBm, isolation at LO to IF of —51dB, isolation at LO to RF of —65dB. The VCO has a tuning range of 1.48GHz/V. The whole RF front-end circuit has a conversion gain of 17dB, P1dB of —34dBm, IIP3 of —25.5dBm. It will be integrated with the following stages in the future to meet the System-on-Chip (SoC) goal.
Advisory Committee Shuenn-Yuh Lee - advisor

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