

A multiband 130nm CMOS low noise amplifier for LTE bands

ABSTRACT

With increasing consumer demand for wireless devices to support multiple air standards and applications, there have been increased trends for the implementation of multiband (MB) devices in the RF front-end of the wireless handsets. This paper presents the design of multiband low noise amplifier (LNA) in the 130nm Silterra CMOS technology. The proposed LNA operates in five major LTE bands (band 1, 2, 3, 4 and 8) used in the smartphone transceiver. The proposed design uses a transistor based shunt feedback to lower the noise figure of the LNA. It uses switched capacitors and MOS varactors that are controlled externally to achieve multiband operation. The gain, noise figure, IIP3 achieved are 20dB, 2.9-4.35dB and -15dBm respectively. The proposed circuit consumes 20.7mW power at 1.2V operation. Notably, the proposed LNA operates at both low-band and high-band making it more suitable for the multiband requirement of modern wireless transceiver frontends.

Keyword: Bandwidth; Gain; Low noise amplifier; Multiband; Noise figure