

An Ultra-Compact 60-GHz Wake-Up Receiver by Reconfiguring Multi-Stage LNAs

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An area-efficient 60-GHz wake-up receiver (WuRx) using reconfiguration techniques of multistage low-noise amplifiers (LNAs) is presented [1]. The gain stages of the 60-GHz LNA are reused as the envelope detectors for the wake-up receiver. Therefore, the bulky components such as extra switches between the wake-up receiver and the LNA, additional antennas, and excess input matching network can be removed in the design of the wakeup receiver. Furthermore, due to the reconfigurability of the LNA, the wake-up receiver can work in sensitivity-boost mode by using several LNA gain stages as a pre-amplifier. The wake-up receiver is fabricated in a 65-nm CMOS process occupying a core area of 0.015mm^2 (excluding the LNA). The WuRx achieves the sensitivity of -46dBm and -60dBm with a power consumption of 64_μW and 12.7mW , respectively.

[1] Rui Wu, Qinghong Bu, Wei Deng, Kenichi Okada, and Akira Matsuzawa, "A 0.015-mm^2 60-GHz Reconfigurable Wake-Up Receiver by Reusing Multi-Stage LNAs," Proc. IEEE Asian Solid-State Circuits Conference (A-SSCC), Kaohsiung, Taiwan, pp. 181-184, Nov. 2014.

