Title: A 5GHz/1.8V CMOS Active Balun Integrated with LNA

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Abstract: The development of high performance monolithic RF front-ends requires innovative RF circuit design to make the best of a good technology. A fully differential approach is usually preferred, due to its well-known properties. Although the differential approach must be preserved inside the chip, there are cases where the input signal is single-ended such as RF image filters and IF filters in a RF receiver. In these situations, a stage able to convert single-ended into differential signals (balun) is needed. The most cited topology, which is capable of providing high gain, consists on a differential stage with one of the two inputs grounded. Unfortunately, this solution has some drawbacks when implemented monolithically.
This work presents the design and simulated results of an innovative high-performance monolithic single to differential converter, which overcomes the limitations of the circuits.The integration of the monolithic active balun circuit with an LNA on a 0.18µm CMOS process is also reported. The circuits presented here are aimed at 802.11a. Section 2 describes the balun circuit and section 3 presents its performance when it is connected to a conventional single-ended LNA. Section 4 shows the simulated performance results focused at phase/amplitude balance and noise figure. Finally, the last section draws conclusions and future work.

KeyWords Plus: Active Balun Integrated; 5GHz/1.8V CMOS

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