Abstracts

RFIC's for mobile communication systems using SiGe bipolar technology

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We report on design aspects and the implementation of RF integrated circuits (RFIC's) using TEMIC's SiGe heterojunction bipolar transistor (HBT) technology. SiGe HBT's with 50-GHz f/sub T/ and f/sub max/ were obtained by a production process including polysilicon resistors, nitride capacitors, and spiral inductors showing Q values up to 10. RF noise figures down to 1 dB at 2 GHz with an associated gain of 14-dB and 1-kHz 1/f corner frequency were obtained. The differences between the device parameters of Si bipolar junction transistor (BJT) and SiGe HBT technology and their influence on IC design are discussed. Design and measurement results of RFIC's, including a low-noise amplifier (LNA) and a power amplifier (PA) for application in a 1.9-GHz digital enhanced cordless telecommunications (DECT) RF front-end and 900-MHz preamplifier for a global system for mobile communication (GSM) power module are presented.

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