Abstracts

5-GHz SiGe HBT monolithic radio transceiver with tunable filtering

M.A. Copeland, S.P. Voinigescu, D. Marchesan, P. Popescu and M.C. Maliepaard. "5-GHz SiGe HBT monolithic radio transceiver with tunable filtering." 2000 Transactions on Microwave Theory and Techniques 48.2 (Feb. 2000 [T-MTT] (Mini-Special Issue on Research Reported at the 1999 Radio Frequency Integrated Circuits (RFIC) Symposium)): 170-181.

A wide-band CDMA-compliant fully integrated 5-GHz radio transceiver was realized in SiGe heterojunction-bipolar-transistor technology with on-chip tunable voltage controlled oscillator (VCO) tracking filters. It allows for wide-band modulation schemes with bandwidth up to 20 MHz. The receiver has a single-ended single-sideband noise figure of 5.9 dB, more than 40 dB on-chip image rejection, an input compression point of -22 dBm, and larger than 70 dB local-oscillator-RF isolation. The phase noise of the on-chip VCO is -100 and -128 dBc/Hz at 100 kHz and 5 MHz offset from the carrier, respectively. The transmitter output compression point is +10 dBm. An image rejection better than 40 dB throughout the VCO tracking range has been demonstrated in the transmitter with all spurious signals 40 dB below the carrier. The differential transceiver draws 125 mA in transmit mode and 45 mA in receive mode from a 3.5-V supply.

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