Abstracts

Compact monolithic integrated resistive mixers with low distortion for HIPERLAN

F. Ellinger, R. Vogt and W. Bachtold. "Compact monolithic integrated resistive mixers with low distortion for HIPERLAN." 2002 Transactions on Microwave Theory and Techniques 50.1 (Jan. 2002, Part I [T-MTT] (Mini-Special Issue on 1999 International Microwave and Optoelectronics Conference (IMOC'99))): 178-182.

Three ultra-compact low-cost mixers, using either a single enhancement, depletion, or deep-depletion FET are presented and compared. They are designed for HIPERLAN and 802.11a receivers with radio and intermediate frequencies around 5.2 and 0.95 GHz, respectively. An improved MESFET large-signal model has been used to allow efficient optimizations of the circuits. The fully integrated mixers have been fabricated using a commercial 0.6-/spl mu/m GaAs MESFET process and require a total chip area of only 0.5 mm/sup 2/. With an ultra-low local-oscillator (LO) power of -10 dBm, the enhancement FET mixer achieves a -4.7 dBm 1-dB input compression point, a 12.6-dB conversion loss, and a 13-dB noise figure. At a low LO power of -2.5 dBm, excellent dynamic properties are obtained for the depletion FET mixer with 2.6-dBm 1-dB input compression point, 8.3-dB conversion loss, and 8.8-dB noise figure. State-of the-art performances with 16-dBm 1-dB input compression point, 5.5-dB conversion loss, and 6.5-dB noise figure are reached for the deep depletion FET mixer at 10-dBm LO power.

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