Abstracts

Low Power HFET Down Converter MMIC's for Wireless Communication Applications

V. Nair, S. Tehrani, R.L. Vaitkus and D.G. Scheitlin. "Low Power HFET Down Converter MMIC's for Wireless Communication Applications." 1995 Transactions on Microwave Theory and Techniques 43.12 (Dec. 1995, Part II [T-MTT] (1995 Symposium Issue)): 3042-3046.

An ultra low power GaAs HFET (heterojunction FET) amplifier/mixer MMIC was designed and characterized for portable communication applications in the 900 MHz band. A completely monolithic LNA (80 mil x 42 mil) achieved 10 dB gain, 2.5 dB NF and -4 dBm input IP3 at an operating cur-rent of 0.5 mA @ 1.0 V. Receiver sensitivity of a front-end circuit consisting of the LNA and a dual gate FET mixer was characterized using the 12 dB SINAD method. The IC achieved -117 dBm receiver sensitivity in the 900 MHz cellular band. The total power consumption of this miniature down converter was about 2 mW. The HFET down converter IC achieved the same receiver sensitivity as a MESFET down converter at 1/5th of the power. The extremely low power dissipation, high third order intercept point, high level of integration, and very good RF performance of this monolithic IC make it an ideal candidate for wireless applications.

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