Abstracts

An antenna diversity MMIC vector modulator for HIPERLAN with low power consumption and calibration capability

F. Ellinger, U. Lott and W. Bachtold. "An antenna diversity MMIC vector modulator for HIPERLAN with low power consumption and calibration capability." 2001 Transactions on Microwave Theory and Techniques 49.5 (May 2001 [T-MTT]): 964-969.

The design and performance of a vector-modulator-based phase shifter for high-performance radio local area networks at 5.2 GHz is presented in this paper. Low power consumption is achieved using a 0.6-/spl mu/m GaAs MESFET process. At a voltage supply of 1.4 V and with a current consumption between 3.5-7 mA, the gain is 0.6 dB and the 1-dB input compression point is -9 dBm. A full 360/spl deg/ phase control range is achieved by combining two of the three vectors, which have phase offsets of 120/spl deg/, with variable amplitude. Chip size is only 1.3 mm/sup 2/. The proposed vector modulator applies a new circuit configuration of variable-gain amplifiers to compensate their transmission phase errors. Within a gain control range of 20 dB, the phase error can be reduced to /spl plusmn/3/spl deg/, which is about a factor of eight better than the results obtained by single FET amplifiers. A simple calibration procedure for the proposed vector modulators is presented to improve the manufacturing yield and to decrease the impact due to temperature changes and aging. A maximum gain error of /spl plusmn/0.8 dB and a maximum phase error of /spl plusmn/7/spl deg/ have been measured after applying this calibration to the designed vector modulator.

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