Abstracts

Optimum Modulator Design for a High-Sensitivity Homodyne System--Binary Modulation Method

K. Watanabe and I. Takao. "Optimum Modulator Design for a High-Sensitivity Homodyne System--Binary Modulation Method." 1975 Transactions on Microwave Theory and Techniques 23.4 (Apr. 1975 [T-MTT] (Special Issue on Microwave Communications)): 354-359.

The optimum modulation method for a high-sensitivity homodyne system employing a reflection-type modulator is investigated. General expressions are derived which describe the effect of the modulator performance on the phase-sensitive conversion loss and noise figure of the system. It is shown that the highest phase-detection and the highest amplitude-detection sensitivities can be simultaneously attainable by the binary modulation method. This theoretical result is confirmed by the performance of the practical system employing a varactor binary modulator. The system has the minimum conversion loss of 6.3 dB. The rejection ratio for the quadrature signal is 42 dB, and the noise figure is 8.7 dB at 9.45 GHz.

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