Abstracts

Microwave MESFET Mixer

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GaAs metal-semiconductor FET's (MESFET) are developed for use in amplifiers at microwave frequencies. The FET has a Schottky barrier between the gate and source, operating in the same manner as a Schottky-barrier diode. If the Schottky barrier is used as a mixer, the IF signal is generated and simultaneously amplified by the FET itself. Thus a mixer with IF preamplifier can be realized. In this paper the theoretical and experimental results of a FET mixer are described. In such operations, the conversion loss in the frequency conversion alone is large due to the high series resistance of the Schottky barrier. However, the overall FET mixer has a "conversion gain" because the IF gain of the FET is made large. The experimental conversion gain is 6 dB at the RF frequency of 10.8 GHz and the IF frequency of 1.7 GHz. The noise figure of the FET mixer is at present large (15 dB, for example), due to large conversion loss in the frequency conversion.

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