Abstracts

GaAs Monolithic MIC Mixer-IF Amplifiers for Direct Broadcast Satellite Receivers

S. Watanabe, J. Ozaki, M. Miyauchi, M. Tatematsu, S. Hori and K. Kamei. "GaAs Monolithic MIC Mixer-IF Amplifiers for Direct Broadcast Satellite Receivers." 1984 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 84.1 (1984 [MCS]): 19-23.

An MMIC mixer-IF amplifier (MIX-IFA) and a band-pass filter (BPF) have been developed for DBS receiver applications. The MIX-IFA chip with a size of 2.0 x 2.25 mm² contains a balanced-type diode mixer using a newly designed 3-dB hybrid circuit and a resistive feedback-type single-stage IF amplifier. The MIX-IFA shows a noise figure of <=72 dB and a conversion gain of 1.5 dB for signal frequencies from 11.7 to 12.2 GHz with a minimum noise figure of 9 dB and a maximum conversion gain of 3.5 dB. All the circuit elements such as Schottky diodes, FET and resistors are fabricated in a planar structure by using selective ion-implantation technology for realizing good uniformity and reproducibility. The BPF chip designed from modification of high-pass filter exhibits an insertion loss of <= 1dB for signals and an attenuation of >= 10 dB for images. With the previously developed LNA, IFA and local oscillator, all MMIC components for DBS receiver are prepared.

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