Abstracts

A Low Current GaAs Monolithic Image Rejection Downconverter for X-Band Broadcast Satellite Applications

T. Yoshimasu, K. Sakuno, N. Matsumoto, E. Suematsu, T. Tsukao and T. Tomita. "A Low Current GaAs Monolithic Image Rejection Downconverter for X-Band Broadcast Satellite Applications." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2433-2438.

This paper describes the design, fabrication and performance of a fully integrated X-band monolithic image rejection downcoverter. The downconverter consists of a low noise amplifier, an image rejection mixer and an intermediate frequency amplifier. The downconverter receives RF signals between 11.7 and 12.3 GHz and converts them down to IF frequency between 1.0 and 1.6 GHz. A conversion gain of 46 ± 1 dB, a noise figure of less than 3.3 dB and an image rejection of more than 30 dB have been achieved over the RF frequency range. The chip size of the downconverter is 1.9 mm x 2.2 mm and its current dissipation is only 43 mA. Since the down-converter has sufficient image rejection due to an on-chip bandstop filter, it requires no off-chip circuits. Therefore, the use of this down-converter in X-band broadcast satellite applications will lead to a great reduction in size and current dissipation.

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