Abstracts

X-Band MMIC Amplifier with Pulse-Doped GaAs MESFET's (Dec. 1991 [T-MTT])

N. Shiga, S. Nakajima, K. Otobe, T. Sekiguchi, N. Kuwata, K.-I. Matsuzaki and H. Hayashi. "X-Band MMIC Amplifier with Pulse-Doped GaAs MESFET's (Dec. 1991 [T-MTT])." 1991 Transactions on Microwave Theory and Techniques 39.12 (Dec. 1991 [T-MTT] (1991 Symposium Issue)): 1987-1994.

An X-band monolithic four-stage low noise amplifier (LNA) with 0.5 µm.gate pulse-doped GaAs MESFET's was successfully demonstrated for a direct broadcast satellite (DBS) converter. This paper presents the design and the test results. The key feature of the research is a detailed demonstration of the advantages of using series feedback with experiments and simulations. This LNA shows an excellent input VSWR match of under 1.3 and an output VSWR match of under 1.4 as well as a noise figure of 1.67 dB and a gain of 24 dB at 12 GHz, Moreover, the noise figure, the gain and VSWR's exhibit very little bias current dependence due to the exceptional features of the pulse-doped structure FET's and the optimized circuit design. Insensitivity to bias current implies performance stability in the face of process fluctuations. Thus, the yield of chips with noise figures of less than 2.0 dB is as high as 62.5%, and the variations of gain and VSWR are highly uniform as well.

❑ Return to main document.