Abstracts

A 2-20 GHz High-Gain Monolithic HEMT Distributed Amplifier (Dec. 1987 [T-MTT])

S.G. Bandy, C.K. Nishimoto, C. Yuen, R.A. LaRue, M. Day, J. Eckstein, Z.C.H. Tan, C. Webb and G.A. Zdasiuk. "A 2-20 GHz High-Gain Monolithic HEMT Distributed Amplifier (Dec. 1987 [T-MTT])." 1987 Transactions on Microwave Theory and Techniques 35.12 (Dec. 1987 [T-MTT] (1987 Symposium Issue)): 1494-1500.

A low-noise 2-21 GHz monolithic distributed amplifier utilizing 0.35-micrometer-gate-length HEMT devices has achieved 12±0.5 dB of gain. This represents the highest gain reported for a distributed amplifier using single FET gain cells. A record low noise figure of 3 dB was achieved midband (4-12 GHz). The circuit design utilizes five HEMT transistors of varying width with gates fabricated by E-beam lithography. The same amplifier fabricated with 0.35-µm-gate-length MESFET's in place of the HEMT devices resulted in 9.5±0.5 dB of gain across the 2-20 GHz band. This record performance level, for a MESFET distributed amplifier is used to determine that the use of HEMT devices rather than the small gate lengths is primarily responsible for the HEMT amplifier performance.

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