Abstracts

Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])

R.E. Lee, R.S. Beaubien, R.H. Norton and J.W. Bacon. "Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2086-2092.

Pseudomorphic HEMT's (termed PHEMT's) with gate lengths of one tenth micrometer based on the AIGaAs/InGaAs/GaAs material system have achieved very low noise millimeter-wave performance. The room-temperature device noise figure at 43 GHz is measured to be 1.32 dB (noise temperature = 103 K) with 6.7 dB of associated gain; when cooled to 17 K physical temperature, the noise figure falls to 0.36 dB (noise temperature = 25 K) with 6.9 dB of associated gain. These pseudomorphic devices also show improved sensitivity to input noise match (N = 0.13 at 43 GHz) compared with conventional HEMT's and MESFET's. These pseudomorphic HEMT devices have the lowest noise temperature (N.F.) and noise sensitivity (normalized to frequency) of any GaAs device yet reported.

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