Abstracts

Phase Noise in Cryogenic Microwave HEMT and MESFET Oscillators

O. Llopis, R. Plana, H. Amine, L. Escotte and J. Graffeuil. "Phase Noise in Cryogenic Microwave HEMT and MESFET Oscillators." 1993 Transactions on Microwave Theory and Techniques 41.3 (Mar. 1993 [T-MTT]): 369-374.

This paper addresses the influence of cooling on the phase noise of HEMT and MESFET oscillators. The initial measurements of the device dc characteristics and low frequency noise (0.1 kHz-100 kHz) under cooling give indications on the suitability of a given device for use in low phase noise cooled oscillators. Cooled pseudomorphic AlGaAs/GaInAs/GaAs HEMT's (PHEMT's) turn out to be particularly well-suited as they are free of collapse and they are free of g-r noise in the frequency range of interest. We report on 4 GHz oscillators operated at 110 K and featuring a phase noise below -100 dBc/Hz at 10 kHz from the carrier in spite of a very modest loaded Q (160). It is suggested that high temperature superconductor resonators could greatly enhance the spectral purity of PHEMT's oscillators.

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