Abstracts

Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)

C.P. Lusher and W.N. Hardy. "Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 643-646.

We have measured the phase noise of an 8.5 GHz GaAs MESFET amplifier at temperatures from 1.7 K to 300 K for input powers from -30 dBm to well past the 1 dB gain compression point, for sideband frequencies from 0.1 Hz to 25 kHz. The observed flicker phase noise was independent of input power, even at levels producing 4 dB of gain compression, also changed very little with bias conditions. The intrinsic phase noise at low temperatures (observed below 2.17 K, where an extrinsic effect due to the bubbling of the liquid helium coolant disappears) was slightly higher than that observed at room temperature. However, we saw no sign of the dramatic increase in flicker phase noise at low temperatures recently reported at 9.7 GHz. Based on our data, we predict that a cryogenic loop oscillator built from such an amplifier should have exceptionally good short-term frequency stability.

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