# Abstracts

## Noise in Single-Frequency Oscillators and Amplifiers

*R.L. Kuvas. "Noise in Single-Frequency Oscillators and Amplifiers." 1973 Transactions on Microwave Theory and Techniques 21.3 (Mar. 1973 [T-MTT]): 127-134.*

A generalization of previous oscillator noise analyses has been developed to permit reliable noise characterization of active nonlinear devices. Effects due to sideband correlation in the equivalent noise source are included. A rotating wave approximation (RWA) developed by Lax is used in obtaining the amplitude and phase noise spectra. Conditions are given for phase stabilization of free-running oscillators and for minimum phase noise in phase-Iocked oscillators and amplifiers. Stability criteria, discussion of spurious sidetones, and effects of a noisy synchronizing signal are given. The noise measure is used to obtain alternative expressions for the noise spectra and the carrier-to-noise ratios of locked oscillators and amplifiers. It is shown that the noise power gain of AM fluctuations is usually much lower than the corresponding gain for FM noise. The theory should be useful in optimizing the noise performance of nonlinear RF generators, such as IMPATT, BARITT, and Gunn diode oscillators.

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