Abstracts

AM and FM Noise of BARITT Oscillators

J.L. Fikart. "AM and FM Noise of BARITT Oscillators." 1974 Transactions on Microwave Theory and Techniques 22.5 (May 1974 [T-MTT]): 517-523.

AM, FM, and baseband noise of a BARITT diode oscillator in the range 100 Hz-50 kHz off the carrier has been measured under various operating conditions. A simple calculation has been made, relating the baseband noise to the oscillator AM and FM noise via measured amplitude and frequency modulation sensitivities and the results have been compared with the noise measured. It is shown that, depending on the bias current applied, both AM and FM noise performance can be degraded by up-conversion. Complete removal of up-converted noise requires a high-impedance low-noise bias supply since both the diode noise and bias supply noise at baseband frequencies may be significant when up-converted. Even with all modulation suppressed, the AM and FM noise has a flicker component almost completely correlated with the diode flicker noise at baseband frequencies. The RF power dependence of the AM and FM noise has also been investigated. It is shown that the BARITT oscillator noise compares very favorably with that of IMPATT's and TEO's. Values of -142 dB/100 Hz (AM noise) and 3.5 Hz/(100 Hz)/sup 1/2/ for Q/sub ext/ = 200 (FM noise) have been measured at 30 kHz off the carrier.

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