Abstracts

Microwave Oscillator Noise Reduction by a Transmission Stabilizing Cavity

J.R. Ashley and C.B. Searles. "Microwave Oscillator Noise Reduction by a Transmission Stabilizing Cavity." 1968 Transactions on Microwave Theory and Techniques 16.9 (Sep. 1968 [T-MTT] (Special Issue on Noise)): 743-748.

The theory of cavity stabilization of a microwave oscillator is reviewed and the appropriate design equations presented. The theory is verified with data taken on three different types of microwave oscillators: 1) a 10-GHz reflex klystron (stabilization factor achieved-22; FM noise reduction-28 dB; typical FM noise level-0.008 Hz in a 1-Hz bandwidth); 2) a 9.7-GHz low-noise two-cavity klystron oscillator (stabilization factor achieved-10; FM noise reduction--21.7 dB; typical FM noise level-0.0007 Hz in a 1-Hz bandwidth); 3) a 10-GHZ avalanche transit time diode oscillator (stabilization factor estimated at 30; FM noise reduction-29.5 dB; typical FM noise level--0.5 Hz in a 1-Hz bandwidth). Stabilization of the avalanche transit time diode oscillator produced a significant reduction in AM noise for modulation frequencies larger than the bandwidth of the stabilizing cavity.

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