

Limitations of Microwave and Millimeter-Wave Mixers Due to Excess Noise (Dec. 1985 [T-MTT])

G.M. Hegazi, A. Jelenski and K.S. Yngvesson. "Limitations of Microwave and Millimeter-Wave Mixers Due to Excess Noise (Dec. 1985 [T-MTT])." 1985 Transactions on Microwave Theory and Techniques 33.12 (Dec. 1985 [T-MTT] (1985 Symposium Issue)): 1404-1409.

Previous analytical work on microwave and millimeter-wave mixers concentrated on circuit aspects, utilizing for the analysis a simple noise model consisting of shot and thermal noise sources at a constant temperature. However, measurements show that the excess noise created in the diode by hot electrons, intervalley scattering, and traps at the metal-semiconductor interface can be important, especially in millimeter-wave mixers. In this paper, the method of calculation of mixer noise performance in the presence of excess noise is given and its influence discussed for room-temperature, as well as for cooled, mixers.

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