

Abstracts

IMPATT Pump Sideband Noise and its Effect on Parametric Amplifier Noise Temperature (Dec. 1975 [T-MTT])

C.A. Tearle and K.R. Heath. "IMPATT Pump Sideband Noise and its Effect on Parametric Amplifier Noise Temperature (Dec. 1975 [T-MTT])." 1975 Transactions on Microwave Theory and Techniques 23.12 (Dec. 1975 [T-MTT] (1975 Symposium Issue)): 1036-1042.

This paper describes an investigation of the amplitude modulation (AM) noise sidebands of silicon IMPATT microwave oscillators and the effect these noise sidebands have on the excess noise temperature of parametric amplifiers. It is shown that the noise temperature may be affected under both large- and small-signal conditions to an extent which depends on the level of pump sideband noise. Simple relationships between easily measurable amplifier properties and pump noise power are given which enable the performance of any combination of pump and amplifier under the two signal conditions to be predicted. A method which simultaneously eliminates the small-signal effect and reduces the large-signal effect to an acceptable level is proposed and demonstrated to be a practical solution.

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