Abstracts

Gain-Bandwidth Optimization of Avalanche-Diode Amplifiers

W.H. Ku and E.F. Scherer. "Gain-Bandwidth Optimization of Avalanche-Diode Amplifiers." 1970 Transactions on Microwave Theory and Techniques 18.11 (Nov. 1970 [T-MTT] (Special Issue on Microwave Circuit Aspects of Avalanche-Diode and Transferred Electron Devices)): 932-942.

This paper contains both theoretical and experimental results on the gain-bandwidth optimization of avalanche-diode amplifiers. These comprise a class of reflection-type negative-resistance amplifiers using avalanche diodes operating in the IMPATT or normal avalanche mode. Theoretical results on gain-bandwidth optimization are derived using various equivalent-circuit models for the IMPATT diode. These results form the basis for a design theory for broad-band avalanche-diode amplifiers. The basic model of the IMPATT diode is that of a band-limited negative-resistance device. Explicit gain-bandwidth limitations are presented in this paper for classes of modified Butterworth- and Chebyshev-amplifier responses. This is then followed by a description of experimental results on broad-band avalanche-diode amplifiers.

❑ Return to main document.