Abstracts

Circuit Model for Characterizing the Nearly Linear Behavior of Avalanche Diodes in Amplifier Circuits

D.F. Peterson and D.H. Steinbrecher. "Circuit Model for Characterizing the Nearly Linear Behavior of Avalanche Diodes in Amplifier Circuits." 1973 Transactions on Microwave Theory and Techniques 21.1 (Jan. 1973 [T-MTT]): 19-27.

A nonlinear circuit model for avalanche diodes is proposed. The model was derived by assuming that the bias dependence of the elements in a known small-signal equivalent-circuit model for existing diodes arises in a manner consistent with the theory of an idealized "Read-type" device. The model contains a nonlinear RL branch, a controlled source, and a linear depletion capacitance. The model is used in the nearly linear sense to predict intermodulation distortion (IMD) and gain compression in avalanche diode amplifiers. Computed results for amplifiers with existing diodes are shown to be in good agreement with experiment.

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