Abstracts

Study of the effect of various parameters on nonlinear transmission-line (NLTL) performance

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Nonlinear transmission-line (NLTL) shock-wave generator performance in the presence of frequency-dependent losses is reported. The skin effect is studied using the harmonic-balance technique with the aid of the HP-MDS design database language. Measured results of a 48-section NLTL excited by a 26.6-dBm sinusoidal signal from the literature are compared with simulation with good agreement. Experimental performance of an eight-section GaAs monolithic-microwave integrated circuit NLTL is reported for 26-dBm drive conditions. Schottky diode capacitance-voltage (C-V) characteristics are computed using the Silvaco physical simulator for different doping profiles. Doping profiles are used as a parameter in NLTL design and their effect on NLTL performance is investigated. S-parameter measurements are performed for the GEC Marconi Materials Technology GaAs Schottky diode family from which the C-V characteristics are extracted and used to validate simulation. The problem of variable dynamic range is addressed and variable diode areas are used to enhance matching.

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