Abstracts

Lossy Transmission Lines: Time Domain Formulation and Simulation Model

P.S. Yeung. "Lossy Transmission Lines: Time Domain Formulation and Simulation Model." 1993 Transactions on Microwave Theory and Techniques 41.7 (Aug. 1993 [T-MTT]): 1275-1279.

The time domain quasi-TEM equations for lossy transmission lines with R, L, C, and G parameters is reformulated and solved to relate directly the currents and voltages at the line terminations, at present and past times. This allows a computer model to be set up for simulating circuits with nonlinear terminations in the time domain using general circuit simulators. This formulation describes propagation of two dynamic forward and backward waves and is the extension of the method of characteristics to the lossy case. Distortion and impedance changes are generated by finite convolutions with past history information at the line terminations. For constant R, L, C, and G, and for a skin effect approximation, the kernels of Green's functions for these convolutions are derived as analytic expressions.

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