Abstracts

Frequency- and time-domain analyses of nonuniform lossy coupled transmission lines with linear and nonlinear terminations

N. Boulejfen, A.B. Kouki and F.M. Ghannouchi. "Frequency- and time-domain analyses of nonuniform lossy coupled transmission lines with linear and nonlinear terminations." 2000 Transactions on Microwave Theory and Techniques 48.3 (Mar. 2000 [T-MTT]): 367-379.

A new technique for the frequency- and time-domain characterization of nonuniform coupled transmission lines is presented in this paper. In the frequency domain, a method-of-moments-based approach is used to compute the 2N/spl times/2N scattering parameter matrix of the N-coupled lines using special frequency-dependent basis functions that give good accuracy over very large bandwidths. In the time domain, the structure's S-parameters are used as its Green's function and are combined with source and terminating load conditions to obtain its transient response. The proposed method can account for loss and is particularly suitable for wideband microwave component designs and ultrahigh-speed/large-bandwidth digital interconnects, including nonlinear terminating loads. A detailed formulation of both the frequency- and time-domain approaches is presented. Several examples of two- and three-line structures are analyzed and the results are compared to published results and other computer-aided-design simulations.

❑ Return to main document.