Abstracts

Riccati Matrix Differential Equation Formulation for the Analysis of Nonuniform Multiple Coupled Microstrip Lines

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A Riccati matrix differential equation (RMDE) is formulated for analyzing nonuniform coupled microstrip lines (NCML'S) in the frequency domain. The formulation is based on a reciprocity-related definition in the theory of multiconductor transmission lines under quasi-TEM assumption. The hybrid-mode nature of modal phase velocities and strip characteristic impedances for multiconductor microstrip structure is included. The nonlinear RMDE is first transformed into a first-order linear differential matrix equation which can be efficiently solved using method of moments. A convergence study is performed to investigate the sufficient number of basis functions used in the method. The voltage-scattering parameters of a tapered microstrip and two three-line structures are presented. The frequency responses of a pair of nonuniform coupled lines are measured and compared with calculated results.

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