Abstracts

On the synthesis of equivalent-circuit models for multiports characterized by frequency-dependent parameters (Dec. 2002 [T-MTT])

R. Neumayer, A. Stelzer, F. Haslinger and R. Weigel. "On the synthesis of equivalent-circuit models for multiports characterized by frequency-dependent parameters (Dec. 2002 [T-MTT])." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2789-2796.

The synthesis of lumped-element equivalent circuits for time-domain analysis of problems with frequency-dependent parameters is of great interest in microwave theory. This paper presents a systematic approach to generate minimal-order realizations for passive microwave circuits characterized by either admittance, impedance, or scattering-parameter data. In addition, a very efficient method to ensure inherent system properties such as stability and passivity is described. The proposed method is suitable for simulating frequency-response-based linear subnetworks in a general circuit environment consisting of lumped/distributed elements and nonlinear devices. Modeling examples for a two-, four-, and ten-port system with nonlinear and linear terminations, respectively, are given.

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