Abstracts

A General Interface Between TLM Models and Lumped Element Circuit Models

P. Russer, B. Isele, M. Sobhy and E.A. Hosny. "A General Interface Between TLM Models and Lumped Element Circuit Models." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 891-894.

We describe the interfacing of transmission line matrix models of distributed microwave circuits with lumped element models. The lumped element circuits are connected with the distributed circuit via a line guiding only its fundamental TEM mode. The distributed circuit is modeled by the transmission line matrix (TLM) method. From the method of moments foundation of TLM it follows that the electromagnetic field can be expanded in sub-domain base functions. The location of the transverse boundary surface between the TLM model and the TEM line is chosen at a location where the evanescent higher modes have completely decayed. Mode matching theory is applied for computation of the scattering matrix between the TLM lines and the TEM line. The interfacing between distributed circuits and lumped element circuit is discussed for the case of a lumped nonlinear diode and a lumped element generator embedded in a microstrip circuit. The microstrip circuit is modeled via TLM wheras the lumped element models are described by the state space approach.

❑ Return to main document.