Abstracts

Physics-based CAD models for the analysis of vias in parallel-plate environments

R. Abhari, G.V. Eleftheriades and E. van Deventer-Perkins. "Physics-based CAD models for the analysis of vias in parallel-plate environments." 2001 Transactions on Microwave Theory and Techniques 49.10 (Oct. 2001, Part I [T-MTT] (Mini-Special Issue on Electrical Performance of Electronic Packaging (EPEP))): 1697-1707.

In this paper, physics-based computer-aided-design (CAD) models for through and buried vias in parallel-plate environments are presented based on radial transmission-line theory. The crosstalk power transferred by the TEM parallel-plate mode between vias is characterized, and extended to the treatment of vias in finite substrates by means of image theory. The presented CAD models can be combined with lumped and distributed circuit elements, as well as linear and nonlinear devices, providing an accurate and fast procedure for the global modeling of high-speed electronic circuits. The corresponding simulation time for representative single or multiple via configurations has been drastically reduced compared to full-wave simulations while maintaining comparable accuracy.

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