Abstracts

Combined Differential and Common-Mode Scattering Parameters: Theory and Simulation

D.E. Bockelman and W.R. Eisenstadt. "Combined Differential and Common-Mode Scattering Parameters: Theory and Simulation." 1995 Transactions on Microwave Theory and Techniques 43.7 (Jul. 1995, Part I [T-MTT]): 1530-1539.

A theory for combined differential and common-mode normalized power waves is developed in terms of even and odd mode impedances and propagation constants for a microwave coupled line system. These are related to even and odd-mode terminal currents and voltages. Generalized s-parameters of a two-port are developed for waves propagating in several coupled modes. The two-port s-parameters form a 4-by-4 matrix containing deferential-mode, common-mode, and cross-mode s-parameters. A special case of the theory allows the use of uncoupled transmission lines to measure the coupled-mode waves. Simulations verify the concept of these mixed-mode s-parameters, and demonstrate conversion from mode to mode for asymmetric microwave structures.

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