Abstracts

Multimode Network Analysis of Planar Transmission Lines

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An alternative approach for the full wave analysis of single or coupled planar transmission lines is presented. Following the proposed approach, a multiple (or single) transmission line structure is viewed as series of staked (or single) transverse discontinuities in a parallel plate waveguide. As a consequence, both top and side coupled structures can be studied. Each individual discontinuity is described in terms of a multimode equivalent network representation. The complete cross section of the planar transmission line structure is then described in terms of a transverse equivalent network and a simple transverse resonance technique is then used to obtain the dispersion behavior, the modal field of the structure, and the characteristic impedances. The multimode equivalent network representations of the individual discontinuities used in this paper have been derived elsewhere and are given in terms of impedance or admittance matrices that are essentially independent from frequency. As a result, they need to be computed only once for each given geometry thus leading to codes that are computationally very efficient.

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