Abstracts

A Modified Mode-Matching Technique and its Application to a Class of Quasi-Planar Transmission Lines

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A rigorous and versatile hybrid-mode analysis is presented to determine the normalized propagation constants in a class of quasi-planar transmission-line structures. The method is accurate and covers the finite metallization thickness, mounting grooves, and an arbitrary number of dielectric subregions. Utilizing a modified mode-matching technique, one can derive discontinuity and transmission-line matrices for each homogeneous subregion. Successively multiplying matrix equations of all subregions leads to the characteristic matrix system. This procedure makes it possible to create a modularized computer program which can be conveniently extended to a wide spectrum of conceivable configurations simply by inserting the matrix equations of additional subregions in the multiplication process. To demonstrate the efficiency of the proposed method, dispersion characteristics of dominant and next higher order hybrid modes in earthed and insulated finlines, suspended microstrips, and coupled striplines with tuning septa, are given as examples.

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