Abstracts

Accurate Solution of Microstrip and Coplanar Structures for Dispersion and for Dielectric and Conductor Losses

D. Mirshekar-Syahkal and J.B. Davies. "Accurate Solution of Microstrip and Coplanar Structures for Dispersion and for Dielectric and Conductor Losses." 1979 Transactions on Microwave Theory and Techniques 27.7 (Jul. 1979 [T-MTT]): 694-699.

For the analysis of coplanar- and microstrip-type structures, a higher order solution of the spectral-domain approach is introduced. Legendre polynomials are used as the basis functions for fields having singularities near the edges, leading to fast convergence to the exact solution. A perturbation technique is combined with the spectral-domain method to evaluate conductor and dielectric losses in microstrip, inverted microstrip, and coupled microstrip in the metallic enclosure. Computations of characteristic impedance and losses incurred in several structures are also presented. Central processing unit (CPU) time on an IBM 360/65 for the zeroth-order approximation ranges from 1 to about 5 s for the whole computation, and increases if higher order of solution is requested for better accuracy. The calculation of attenuation due to conductor losses is found to be particularly sensitive to order of approximation, so that the generally used "zeroth-order" solution is inadequate. A user-oriented program package has been written, including options on order of mode, order of solution (i.e., of approximation), impedance, attenuation, and number of substrates. Although written for single or coupled microstrip, the program can be adapted for arbitrary arrangements of thin coplanar conductors. The program is described separately.

❑ Return to main document.