Abstracts

Analysis of Lossy Planar Transmission Lines by Using a Vector Finite Element Method

M.S. Alam, M. Koshiba, K. Hirayama and Y. Hayashi. "Analysis of Lossy Planar Transmission Lines by Using a Vector Finite Element Method." 1995 Transactions on Microwave Theory and Techniques 43.10 (Oct. 1995 [T-MTT]): 2466-2471.

The vector finite element method with hybrid edge/nodal triangular elements is extended for the analysis of lossy planar transmission lines. In order to handle lossy conductor transmission lines, the present approach includes the effect of finite conductivity of a lossy area, and the dissipations in metallic conductors and dielectrics are calculated directly by considering a complex permittivity for the lossy region of interest. Propagation constant formulation is used in the FEM, which avoids spurious solutions absolutely and can handle sharp metal edges in inhomogeneous electromagnetic waveguides. Numerical examples are computed for microstrip lines, finlines, and triplate strip lines. The results obtained agree well with the earlier theoretical and experimental results, and thus show the validity of the method. Also, the current distributions on the lossy microstrip lines with finite strip thickness and isotropic substrates are presented.

❑ Return to main document.