Abstracts

Finite-Element Formulation for Lossy Waveguides

K. Hayata, K. Miura and M. Koshiba. "Finite-Element Formulation for Lossy Waveguides." 1988 Transactions on Microwave Theory and Techniques 36.2 (Feb. 1988 [T-MTT] (Special Issue on Computer-Aided Design)): 268-276.

An efficient computer-aided solution procedure based on the finite-element method is developed for solving general waveguiding structures composed of lossy materials. In this procedure, a formulation in terms of transverse magnetic-field component is adopted and the eigenvalue of the final matrix equation corresponds to the propagation constant itself. Thus, one can avoid the unnecessary iteration using complex frequencies. To demonstrate the strength of the present method, numerical results for a rectangular waveguide filled with lossy dielectric are presented and compared with exact solutions. As more advanced applications of the present method, a shielded image line composed of a lossy anisotropic material and a lossy dielectric-loaded waveguide with impedance walls are analyzed and evaluated.

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