Abstracts

Surface Integral Formulation for Calculating Conductor and Dielectric Losses of Various Transmission Structures

T. Roy, T.K. Sarkar and M. Swaminathan. "Surface Integral Formulation for Calculating Conductor and Dielectric Losses of Various Transmission Structures." 1995 Transactions on Microwave Theory and Techniques 43.1 (Jan. 1995 [T-MTT]): 176-185.

The power-loss method, along with a surface integral formulation, has been used to compute the attenuation constant in microstrip and coplanar structures. This method can be used for the analysis of both open and closed structures. Using the surface equivalence principle, the waveguide walls are replaced by equivalent electric surface currents and dielectric surfaces are replaced by equivalent electric and magnetic surface currents. Enforcing the appropriate boundary condition, and E-field integral equation (EFIE) is developed for these currents. Method of moments with pulse expansion and point matching testing procedure is used to transform the integral equation into a matrix one. The relationship between the propagation constant and frequency is found from the minimum eigenvalue of the moment matrix. The eigenvector pertaining to the minimum eigenvalue gives the unknown electric and magnetic surface currents.

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