Abstracts

Equivalent network representation of boundary conditions involving generalized trial quantities-application to lossy transmission lines with finite metallization thickness

The derivation of integral equations for solving boundary conditions by mere application of analog Kirchhoff's and Ohm's laws is used. Generalized trial quantities are introduced as virtual adjustable sources in the equivalent network representation of boundary conditions. The lossy conductor domain of a planar transmission line is represented by a particular two-port. Thus, metallic losses can be evaluated for any metallization thickness without restricting the conductor modeling to a simple surface impedance approximation. In this paper, this two-port model is discussed and numerical results relative to a lossy coplanar waveguide (CPW) are presented. These results are in very good agreement with those obtained from the mode-matching technique and with other experimental data available in the literature. The size of matrices involved in the calculation of losses is twice as large as that in the lossless case. Moreover, the authors' formulation can be easily applied to superconducting planar transmission lines.

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