Abstracts

A Simplified Circuit Model for Microstrip (Short Papers)

The advantage of a network model for a physical structure is that the model, if correctly established, implicitly contains the physical constraints of the actual system, and these constraints need not subsequently be called into play for every new case. A recent example is the use of coupled lines to model longitudinally uniform but transversely inhomogeneous waveguides. The network model for a cylindrical waveguide loaded concentrically with a dielectric rod comprised a TE and a TM transmission line coupled together, and the properties of this model demonstrated that, surprisingly, the smooth lossless waveguide structure could support complex eigenvalues as well as backward waves. The general network idea stems from Schelkunoff who established that uniform metallic-bound lossless guide structures can be represented by an infinite number of coupled TE and TM transmission lines. The practical approximating network model is obtained by appropriately truncating the infinite Shelkunoff representation.

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