Abstracts

Planar Circuits, Waveguide Models, and Segmentation Method

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The planar-circuit approach to the analysis and design of microwave integrated circuits (MIC's), with specific reference to microstrip circuits, is reviewed. The planar approach overcomes the limitations inherent to the more conventional transmission-line approach. As the operating frequency is increased and/or Iow-impedence levels are required, in fact, the transverse dimensions of the circuit elements become comparable with the wavelength and/or the longitudinal dimensions. In such cases, one-dimensional analyses give inaccurate or even erroneous results. The analysis of planar elements is formulated in terms of an N-port circuit and results in a generalized impedance-matrix description. Analysis techniques for simple geometries, such as the resonant mode expansion, and for more complicated planar configurations, such as the segmentation method, are discussed along with planar models for accounting for fringing fields effects and radiation loss.

❑ Return to main document.