Abstracts

Parameters of Microstrip Transmission Lines and of Coupled Pairs of Microstrip Lines

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A theoretical analysis is presented of microwave propagation on microstrip, with particular reference to the case of coupled pairs of microstrip lines. Data on this type of transmission line are needed for the design of directional couplers, filters, and other components in microwave integrated circuits. The inhomogeneous medium, consisting of the dielectric substrate and the vacuum above it, is treated in a rigorous manner through the use of a "dielectric Green's function" which expresses the discontinuity of the fields at the dielectric-vacuum interface. Results are presented in graphical form for substrate dielectric constants of 1, 9, and 16, and a range of values of width and spacing of the strips. Numerical tables for these and other cases are also available. The tables present capacitance, characteristic impedance, and velocity of propagation of the even and odd normal modes. The method lends itself to the treatment of other geometries which are of practical interest, such as "thick" strips, presence of an unsymmetrically located upper ground plane, etc.

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