Abstracts

Characteristic Impedance and Phase Velocity of a Dielectric-Supported Air Strip Transmission Line with Side Walls

D.L. Gish and O. Graham. "Characteristic Impedance and Phase Velocity of a Dielectric-Supported Air Strip Transmission Line with Side Walls." 1970 Transactions on Microwave Theory and Techniques 18.3 (Mar. 1970 [T-MTT]): 131-148.

The characteristic impedance and phase velocity of a dielectric-supported air strip transmission line with side walls and with center conductors having zero thickness have been obtained by means of the variational method. Green's functions are used for setting up the variational expression. Using a 22-term expansion for the charge distribution on the center conductors, the Rayleigh-Ritz method is then applied in the calculation of the characteristic impedance and phase velocity of the strip transmission line. Design curves are presented and a correction factor is derived that can be applied when the thickness of the center conductors is not zero. The design curves are quite general and apply equally well to any isotropic dielectric material that is used as a support, regardless of its dielectric constant. The experimental data presented verifies the theoretical results.

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