Abstracts

Propagation of Quasi-Static Modes in Anisotropic Transmission Lines: Application to MIC Lines

In this paper, we analyze the field propagation in a general N-conductor transmission line embedded in an inhomogeneous and anisotropic medium, through the series expansion of the field in powers of frequency. The quasi-static approach is deduced as a zero-order approach upon the field and a first-order approach for the propagation constant. It is shown that it is even possible to decompose the field into a sum of propagating modes with a scalar propagation factor. The special case of transmission lines in nonmagnetic media is explicitly considered. A method to find out the mode characteristics of any open planar MIC line with anisotropic dielectric substrates is developed and applied to some MIC structures of interest, specifically broadside edge-coupled microstrips with inverted and noninverted substrates.

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