Abstracts

Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses

M. Horno, F.L. Mesa, F. Medina and R. Marques. "Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1059-1068.

In this paper, a quasi-TEM analysis of multiconductor planar lines embedded in a layered structure involving lossy iso/anisotropic electric and/or magnetic materials is achieved. Conditions under which a quasi-TEM assumption is valid are theoretically determined. An efficient spectral-domain analysis is used to determine the complex capacitance, [C] and inductance, [L] matrices characterizing the transmission system. The computation of [L] when media characterized for a fully general permeability tensor are present, is reduced to the computation of an equivalent capacitance matrix. It is also shown that most actual MMIC microstrip-type structures (where semiconductor substrates are present and possible future applications including lossy magnetic materials can be analyzed by using the simple quasi-TEM model. The validity of the results has been verified by comparison with "full-wave" theoretical and experimental data on microstrip lines on magnetic substrates and slow-wave structures.

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