Abstracts

Planar Transmission Lines with Finitely Thick Conductors and Lossy Substrates

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Various types of lossy planar transmission lines are analyzed by extending the spectral domain approach. Introduction of the finite metallization model and choice of the proper basis functions for the model does not only overcome the computational difficulty, but also reduce drastically the computation labor for the calculation of the conductor loss. This procedure preserves the versatility of SDA, and it can be applied to various types of planar transmission lines. Numerical results include the effective dielectric constants, characteristic impedances and total losses (conductor and dielectric losses) for slot lines, coplanar waveguides, and strip lines. Numerical computations show that the currents on the side walls of the metal conductors make the considerable contributions to the conductor loss and cannot be neglected, and that the quasistatic approximation gives reasonable results for the loss calculation of CPW if the metallization thickness effect is taken into consideration properly.

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