Abstracts

Calculations of the Dispersive Characteristics of Microstrips by the Time-Domain Finite Difference Method

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The dispersive characteristics of microstrips have been investigated by many authors using various numerical and empirical methods. Those results showed a lack of agreement with each other, and the true dispersive characteristics of microstrips still need to be identified. In this paper, a direct time-domain finite difference method is used to recharacterize the microstrip. Maxwell's equations are discretized both in time and space and a Gaussian pulse is used to excite the microstrip. The frequency-domain design data are obtained from the Fourier transform of the calculated time-domain field values. Since this method is completely independent of all the above-mentioned investigations, the new results can be considered as an impartial verification of the published results. The comparison of the time-domain results and those from the frequency-domain methods has shown the integrity of the time-domain computations. Since this method is very general and can be applied to model many other microwave components, its success in the microstrip problem is an important step toward its general application.

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