Abstracts

Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method

G.-C. Liang, Y.-W. Liu and K.K. Mei. "Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1949-1957.

We have presented a detailed full-wave analysis of a coplanar waveguide (CPW) and a slotline by the time-domain finite-difference method (TD-FD). The transient propagating waveforms along the coplanar waveguide and slotline, which are excited by retarded Gaussian pulses, are found in the time domain. After the time-domain field distributions are obtained, frequency-domain parameters such as the effective dielectric constant and the complex characteristic impedance are calculated using Fourier transformations. The results agree well with available theoretical and experimental data over a tide frequency range. We have also checked the validity of the quasi-TEM assumptions for CPW and slotline analyses. This is done by evaluating the ratios of the Iongitudinal and transverse field components directly.

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