Abstracts

Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines

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Delay times of digital logic circuits are now becoming smaller than those of interconnections used in packaging. At high speeds, such interconnections no longer behave as simple short circuits, but take on the appearance of transmission lines. One may choose to solve the problem of delay by increasing the density of the system. This, however, introduces the problem of "cross talk." The analysis of delay and cross talk in a system of transmission lines is rather complex; for this reason, it is usually done with the aid of computer simulation. The present paper introduces a very efficient and flexible time-domain analysis technique to predict the reflections and cross talk. Numerical results show that this technique is indeed efficient and accurate in the transient analysis of general multiple coupled line systems. Furthermore, this algorithm will eventually be coded in a form of subroutine compatible with any standard CAD program, such as SPICE.

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