Abstracts

Simple determination of all capacitances for a set of parallel microstrip lines

F. Sellberg. "Simple determination of all capacitances for a set of parallel microstrip lines." 1998 Transactions on Microwave Theory and Techniques 46.2 (Feb. 1998 [T-MTT]): 195-198.

A fast and moderately accurate method to describe the complicated dependence on design and process parameters of coupling capacitances between a set of parallel lines is presented in this paper. It involves only one circuit-dependent parameter at a time. This is accomplished by calculating the capacitance coefficient matrix through inversion of a potential coefficient matrix with much simpler dependence on geometry. Self elements are approximately independent of the presence of other lines, and mutual elements do not depend on linewidths or interfering lines as long as the ground is sufficiently far away. The potential coefficients are derived by inverting one- or two-line capacitance matrices that are either theoretically calculated or determined by measurements on integrated circuit (IC) test structures. Look-up tables for a specific IC process can then be constructed with only linewidth as the parameter for self potential elements and distance between line centers as parameter for mutual potential elements. General algorithms have been derived for microstrip on one or two layers of dielectric.

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