Abstracts

Exploiting Structure Periodicity and Symmetry in Capacitance Calculations for Three-Dimensional Multiconductor Systems

R.-B. Wu and L.L. Wu. "Exploiting Structure Periodicity and Symmetry in Capacitance Calculations for Three-Dimensional Multiconductor Systems." 1988 Transactions on Microwave Theory and Techniques 36.9 (Sep. 1988 [T-MTT]): 1311-1318.

The structure periodicity and symmetry usually encountered in the design and packaging of integrated circuits are utilized to dramatically alleviate the computation cost in the capacitance calculations for three-dimensional multiconductor systems by the integral equation method. For periodic structures, the region of unknowns is reduced to the base period by employing a modified Green's function which circumvents the periodicity singularity. For the structures with s orthogonal planes of symmetry, where s=1, 2, or 3, the region of unknowns is reduced to 1/2/sup s/ of the original whole space by the help of even- and odd-mode decomposition techniques. Both algorithms are embedded into a general three-dimensional capacitance calculation program by which a numerical calculation for the via capacitance in a multilayer ceramic environment is presented and compared with the experimental measurements.

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