Abstracts

Efficient Modeling of Power Planes in Computer Packages Using the Finite Difference Time Domain Method

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Recent advancements in electronic packaging, that have led to the development of high speed devices with increasingly high interconnect densities, have precipitated the need to incorporate high frequency effects in the modeling of these structures. The Finite Difference Time Domain (FDTD) method is not only well-suited for handling the complex geometries involved, but is also useful for generating the desired frequency response with a single simulation. In this paper, we describe several techniques for improving the computational efficiency of the conventional FDTD algorithm as applied to the problem of modeling complex power plane geometries. We also show how the time domain response can be processed to extract equivalent circuits that are valid in the high frequency regimes up to several GHz, and are suitable for use in circuit simulators.

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