Abstracts

Spectral Domain Technique Using Surface Wave Excitation for the Analysis of Interconnects

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Analysis of interconnects is an area of prime importance in packaging since the characteristics of the interconnections eventually dictate the performance of the package. The analysis consists of two parts, namely, parameter extraction and package simulation where the former represents the computation of the line parameters such as resistance, inductance, capacitance, and conductance (R, L, C, G), At high frequencies, the line parameters vary with frequency which requires a complete solution to Maxwell's equation for parameter extraction. This translates to the computation of the propagation constant as a function of frequency (beta(omega)) which is the focus of the work in this paper. Since packages typically consist of periodic structures, the spectral domain technique (SDT) lends itself to easy analysis and has therefore been used in this paper. A new method utilizing the surface wave excitation principle applied to the scattering problem has been used to compute (beta(omega)) which is different from the eigenvalue solution that has been used in the past. Using the present formulation, a single algorithm can be used both for the computation of wave propagation and scattering/radiation by changing the angle of the incident wave.

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