Abstracts

Application of system-level EM modeling to high-speed digital IC packages and PCBs

Jong-Gwan Yook, L.P.B. Katehi, K.A. Sakallah, R.S. Martin, L. Huang and T.A. Schreyer. "Application of system-level EM modeling to high-speed digital IC packages and PCBs." 1997 Transactions on Microwave Theory and Techniques 45.10 (Oct. 1997, Part II [T-MTT] (Special Issue on Interconnects and Packaging)): 1847-1856.

A system-level electromagnetic (EM) modeling tool combining a three-dimensional (3-D) full-wave finite-element EM-field analysis tool and a time-domain electric-circuit simulator is developed and applied to various geometries such as multilayer printed circuit boards (PCBs), signal lines embedded in a PCB or package, and split power-distribution network. Since the signal integrity is a primary concern of high-speed digital circuits, the noise distributions on various circuit planes are evaluated from the analysis. These noise distributions, often called voice maps, are utilized to identify the location of the major source of simultaneous switching noise (SSN). This information can eventually be adapted for optimum placement of decoupling capacitors to minimize the noise fluctuations on the various circuit planes on an entire PCB.

❑ Return to main document.