Computational of Capacitance and Inductances Matrices of Integrated-circuit Interconnects for Open Four Conductors with Three Levels Systems

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Abstract

Computational methods of electromagnetic used in analyzing and designing of electronic interconnects and packages become an important area in industry due to the rapid increase in operating frequencies and feature size of integrated circuits systems. In this article, a new quasi-TEM capacitance and inductance analysis of multiconductor multilayer interconnects is successfully demonstrated using finite element method (FEM). We specifically illustrate two electrostatic models of open four interconnected lines with three levels system. Figure 1 shows the first designed model which its results compared to the method of moment (MoM) and on-surface measured equation of invariance (OSMEI) method. Excellent agreement with results from the previous methods is demonstrated. Figure 2 shows the second designed model which is recently developed by the authors. Also, we determine the quasi-static spectral for the potential distribution of the integrated circuits.

Reference

Y.W. Liu, K. Lan, and K. K. Mei," Computation of capacitance matrix of integrated circuit interconnects using on surface MEI method," IEEE 1999, pp.417-420.
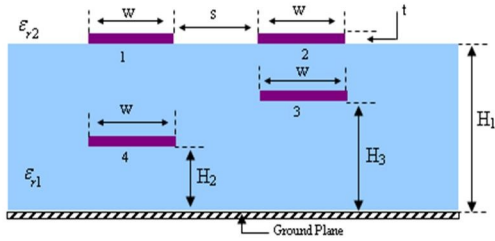
Figures used in the abstract

Figure 1: Cross section of open four interconnected lines with three levels system, two conductors in the substrate at different levels.
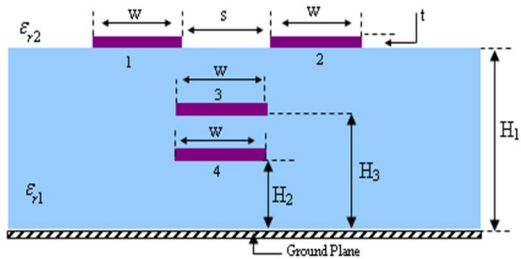

Figure 2: Cross section of open four interconnected lines with three levels system, two conductors in the substrate are situated on top of each other.