



Computation of Conductance and Capacitance for IC Interconnects on a General Lossy Multilayer Substrate

<http://www.firstlight.cn> 2001-03-19

In this paper a simple method for analysis and modelling of transmission interconnect lines on general lossy multilayer substrates at high bit rates is presented. The analysis is based on semi-analytical Green's function approach and recurrence relation between the coefficients of potential in n and $n + 1$ layers, respectively. The electromagnetic concept of free charge density is applied. It allows us to obtain integral equations between electric scalar potential and charge density distributions. These equations are solved by the Galerkin procedure of the Method of Moments. New approach is especially adequate to model 2-D layered structures with planar boundaries for frequencies up to 20GHz (quasi-stationary field approach). The transmission line parameters (capacitance and conductance per unit length) for the given interconnect multilayer geometry are computed. A discussion of the calculated line admittance in terms of technological and geometrical parameters of the structure is given. A comparison of the numerical results from the new procedure with the techniques presented in the previous publications are provided, too.

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