Abstracts

Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits

T. Shibata and E. Sano. "Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 881-890.

A full-wave analysis of MIS structure micron coplanar transmission lines on doped semiconductor substrates is carried out by means of a finite difference time-domain approach. Metal conductor loss is taken into account in the analysis, which has been ignored in previous full-wave treatments. Line parameters as well as electromagnetic field distributions are calculated over a wide frequency range involving slow-wave and dielectric quasi-TEM mode limits. Measurements of these line parameters, varying substrate resistivity from 1 to 1000 Omega · cm, in the frequency range up to 40 GHz are also presented, and these agree with analysis quite well. On the basis of these results, an equivalent circuit line model will be induced and some considerations on the relationship between line structure and properties will be made.

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