Abstracts

Wideband Conductor Loss Calculation of Planar Quasi-TEM Transmission Lines with Thin Conductors Using a Phenomenological Loss Equivalence Method

Conductor loss calculation based on the incremental inductance rule is not valid if conductor thickness becomes very thin and on the order of the skin depth, such as in monolithic microwave integrated circuits. In this paper, conductor loss of a planar quasi-TEM transmission line with thin conductors is calculated over a broad frequency range using an approach to be called a phenomenological loss equivalence method. The calculated conductor losses of microstrip lines agree well with those calculated using the finite element method. Because of its simplicity, this method should be very useful for computer-aided design of monolithic microwave circuits. In addition, this method can also be applied to very thin and narrow superconductive lines using the complex conductivity based on the two-fluid model.

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