Abstracts

Approximate Formulas for Line Capacitance and Characteristic Impedance of Microstrip Line

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A numerically efficient and accurate method for the derivation of line capacitance and characteristic impedance of a thin microstrip line is discussed. Galerkin's method is found to give highly accurate results when only one or two basis functions are used. We use three methods to derive approximate formulas for microstrip line capacitance and characteristic impedance. Asymptotic lower bounds derived through the variational method and matched asymptotic expansion methods give expressions which reveal the functional forms of these approximate formulas. Seminumerical approximation gives rise to formulas usable on a desk calculator. It is found that there is excellent agreement between the seminumerical formulas, the asymptotic formula derived through matched asymptotic expansions and numerically derived results.

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