Abstracts

A general conformal-mapping approach to the optimum electrode design of coplanar waveguides with arbitrary cross section

M. Goano, F. Bertazzi, P. Caravelli, G. Ghione and T.A. Driscoll. "A general conformal-mapping approach to the optimum electrode design of coplanar waveguides with arbitrary cross section." 2001 Transactions on Microwave Theory and Techniques 49.9 (Sep. 2001 [T-MTT] (Mini-Special Issue on the 2001 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 1573-1580.

The Schwarz-Christoffel toolbox, a free MATLAB package for the computation of conformal maps, is applied to the quasi-static analysis of coplanar waveguides (CPWs) of arbitrary cross section in order to provide computationally efficient and very accurate estimates of their capacitance, inductance, characteristic impedance, and skin-effect attenuation. A few examples of many-sided polygonal waveguides are discussed, and the trapezoidal CPW, important, for example, for electrooptic modulators, is described in full detail, providing general guidelines for the electrode geometry optimization. The technique is validated through a comparison with the results of a full-wave finite-element method, and excellent agreement is demonstrated both in vacuo and with two-layer dielectric substrates.

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