Abstracts

From Approximations to Exact Relations for Characteristic Impedances

W. Hilberg. "From Approximations to Exact Relations for Characteristic Impedances." 1969 Transactions on Microwave Theory and Techniques 17.5 (May 1969 [T-MTT]): 259-265.

Approximations for the characteristic impedance of a special two conductor stripline and for the general function K/K' are derived by a transformation method recently described in the literature; the first, second, and third approximations having a greatest relative error of the order of 10/sup -3/, 10/sup -6/, and 10/sup -12/, respectively. They can be introduced into an algorithm which is based on elementary conformal mappings, and thus further approximations with rapidly vanishing errors can be derived. The results agree with those for the function K/K' obtained by elliptic integral theory. Obviously no such theory is needed to calculate characteristic impedances or the function K/K' with arbitrary accuracy. The advantages of the new method are illustrated for shielded coupled-strip transmission lines, for which an extended diagram with extreme parameter values has been worked out.

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