Abstracts

Transmission-Line Properties of Parallel Wide Strips by a Conformal-Mapping Approximation

A transmission line is made of a symmetrical pair of strip conductors, face-to-face, or a single strip parallel to a ground plane. The strip width is nominally greater than the separation, but may be somewhat less than the separation. The field configuration is evaluated by a conformal mapping procedure which gives a very close approximation in terms of ordinary functions (exponential and hyperbolic) rather than the exact solution in terms of difficult functions (elliptic). Computation procedures are given for synthesis or analysis, the former following more naturally from the derivation. For the transitional case of strip width equal to separation, the mapping approximation is found to leave a relative error of the order of 10^{-8}, in the wave resistance or shape ratio. Simple, explicit, practical formulas are developed for practical use with slide-rule accuracy. Emphasis is placed on establishing and specifying the residual error of each formula.

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