Abstracts

A Calculation of the Conformal Mapping Parameters Used in Evaluating the Approximate Fringing Capacitances

H.J. Riblet. "A Calculation of the Conformal Mapping Parameters Used in Evaluating the Approximate Fringing Capacitances." 1979 Transactions on Microwave Theory and Techniques 27.2 (Feb. 1979 [T-MTT]): 148-150.

The "approximate" fringing capacitances C'/sub f0/ and C'/sub fe/ are found by mapping the upper half plane into the interior of an infinite polygon bounded by an infinite rectangular bar and so infinite channel. The thickness of the bar t its spacing from the channel at one end s/2, and the width of the channel b are given in terms of two independent parameters k and a. It is shown how these relationships may be inverted and how k and a may be expressed directly in terms t/b and s/b. First, q'= exp (-pi K/K') is expressed as an odd power series in exp (-pi s/b) whose coefficients are irrational functions of t/b. k is given by a well known formula in terms of q' from the theory of elliptic functions and an expression for a in terms of q' and s/b is derived. Numerical values of the coefficients of the first six terms in the expansion of q' in terms of exp (-pi s/b) for t/b= 0.1, 0.2, 0.3, 0.4, 0.5 are given. For this range of t/b, useable accuracy is shown for s/b as small as 0.1.

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