Abstracts

Frequency-Dependent Analysis of a Shielded Microstrip Step Discontinuity Using an Efficient Mode-Matching Technique

N.K. Uzunoglu, C.N. Capsalis and C.P. Chronopoulos. "Frequency-Dependent Analysis of a Shielded Microstrip Step Discontinuity Using an Efficient Mode-Matching Technique." 1988 Transactions on Microwave Theory and Techniques 36.6 (Jun. 1988 [T-MTT]): 976-984.

The frequency-dependent characteristics of microstrip step discontinuities are analyzed by employing a mode-matching technique. The fields on both sides of a discontinuity are expanded in terms of the normal hybrid modes of the shielded microstrip line. The properties of these hybrid modes are determined by applying a previously developed analytical approach using singular integral equation techniques. In addition to propagating modes, higher order modes are also taken into account. The higher order modes are evanescent-type waves. The propagation constants of the evanescent waves in general are found to be complex numbers. A mode-matching procedure is developed to determine the reflection and transmission coefficients of the discontinuity. The use of two types of products to treat the boundary conditions for the continuity of the tangential electric and magnetic fields results in a highly efficient and numerically stable solution. Numerical results are computed for several step discontinuities and the results are compared with previously published data.

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