Abstracts

Design of Waveguide E-Plane Filters with All-Metal Inserts by Equal Ripple Optimization

V. Postoyalko and D.S. Budimir. "Design of Waveguide E-Plane Filters with All-Metal Inserts by Equal Ripple Optimization." 1994 Transactions on Microwave Theory and Techniques 42.2 (Feb. 1994 [T-MTT]): 217-222.

An optimization based approach to the design of E-plane filters is described. An optimization procedure based on Cohn's equal ripple optimization is developed. This vector procedure has several advantages over the general purpose optimization routines previously applied to the design of E-plane filters. The problem of local minima does not arise. Optimization is carried out with respect to the Chebyshev (or minimax) criteria. Less frequency sampling and therefore less calculation of the electrical parameters of E-plane discontinuities is required. The design of a symmetrical E-plane filter is considered. Higher order mode interaction between E-plane discontinuities is not included in the design. For the design example considered this is shown not to be significant. A numerically efficient method, requiring only real scalar arithmetic, for calculating the insertion loss of a symmetrical cascade of lossless symmetrical 2-ports is employed. Measurements on a fabricated filter confirm the accuracy of the design procedure.

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