Abstracts

Accurate synthesis of inline prototype filters using cascaded triplet and quadruplet sections

G. Macchiarella. "Accurate synthesis of inline prototype filters using cascaded triplet and quadruplet sections." 2002 Transactions on Microwave Theory and Techniques 50.7 (Jul. 2002 [T-MTT]): 1779-1783.

A general method for designing low-pass prototype networks with cascade inline topology is presented. The generalized Chebyshev characteristic is imposed, allowing an equiripple response in the passband and transmission zeros arbitrarily displaced in the complex plane (symmetry with respect to the imaginary axis is, however, required). A computationally efficient method is employed for evaluating reflection and transmission polynomials, given the transmission zeros; then, the synthesis of a starting coupling matrix is performed using one of the methods available in the literature. The desired inline topology is then assembled by cascading elementary building blocks (triplets and/or quadruplets), following specific rules which assure the feasibility of the structure; finally, the synthesis is performed by applying a multiple similarity transform to the starting coupling matrix (the set of rotation angles is determined by means of an efficient and fast optimization procedure). Examples are reported which validate the proposed synthesis procedure.

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