Abstracts

Multiplicity Line in Cascade Transmission Synthesis--Part I

H. Seidel and J. Rosen. "Multiplicity Line in Cascade Transmission Synthesis--Part I." 1965 Transactions on Microwave Theory and Techniques 13.3 (May 1965 [T-MTT]): 275-283.

The synthesis of a stepped equal-length transmission line structure to a given insertion loss function sometimes leads to a multiplicity of untrivially related solutions. The philosophy of synthesis is explored to understand this lack of uniqueness and a new statement of sufficiency and necessity of synthesis is developed based only on an insertion loss statement. The conditions are developed for nonuniqueness to occur and it is observed that these conditions are particularly prevalent in transmission line couplers. It is precisely the nonuniqueness of couplers that accounts for both the asymmetric and symmetric realizations. The symmetric coupler is generally the more difficult of the two to design and both exact and approximate methods of design are given in this case.

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