Abstracts

General Extracted Pole Synthesis Technique with Applications to Low-Loss TE/sub 011/ Mode Filters

J.D. Rhodes and R.J. Cameron. "General Extracted Pole Synthesis Technique with Applications to Low-Loss TE/sub 011/ Mode Filters." 1980 Transactions on Microwave Theory and Techniques 28.9 (Sep. 1980 [T-MTT]): 1018-1028.

A novel synthesis technique is developed for two-port networks which possess finite real frequency transmission zeros. The low-pass prototype is synthesized in the form of a network with complex conjugate symmetry where the real frequency transmission zeros are extracted from both ends and realized by simple resonators separated by phase shifters. The remaining transmission zeros are realized by the central part of the filter in the form of a cross-coupled double array. This prototype is particularly suitable for designing waveguides bandpass filters and each real frequency transmission zero is independently tunable. Furthermore, in the case of the most complex transfer function with all possible types of transmission zeros, the realization requires only one type of coupling which is necessary in the important case of TE/sub 011/ cylindrical mode cavity resonators. The general synthesis technique is given and the process illustrated by a nontrival example. Additionally, from the results of a computer program based upon the synthesis techniques, the important differences between the possible prototype forms for the same transfer function resulting from extracting the transmission zeros in different orders are cited.

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