Abstracts

Asymmetric Realizations for Dual-Mode Bandpass Filters

R.J. Cameron and J.D. Rhodes. "Asymmetric Realizations for Dual-Mode Bandpass Filters." 1981 Transactions on Microwave Theory and Techniques 29.1 (Jan. 1981 [T-MTT]): 51-58.

Two analytic synthesis techniques are presented for even-degree dual-mode in-line prototype networks up to degree 14. Commencing with the coupling matrix for the double cross-coupled array, rotational transformations are applied to transform the matrix into the form required for the dual-mode in-line asymmetric structure. "Asymmetric" here means that the coupling elements (irises, screws) are unequal in value about the physical center of the filter. The necessity for these asymmetric solutions arose when it was discovered that it was impossible to realize certain useful transmission characteristics with the symmetric in-line structure, on account of their transmission zero pattern in the complex-plane representation of the transfer function. Furthermore, because the full coupling matrix is used instead of the even-mode matrix as with the symmetric solution, the asymmetric in-line realization process may be applied to electrically asymmetric matrices, such as those for single ended filters for multiplexer applications. To demonstrate the validity of the theory, a practical model of each type of realization has been constructed.

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