Abstracts

General coupling matrix synthesis methods for Chebyshev filtering functions

R.J. Cameron. "General coupling matrix synthesis methods for Chebyshev filtering functions." 1999 Transactions on Microwave Theory and Techniques 47.4 (Apr. 1999 [T-MTT]): 433-442.

Methods are presented for the generation of the transfer polynomials, and then the direct synthesis of the corresponding canonical network coupling matrices for Chebyshev (i.e., prescribed-equiripple) filtering functions of the most general kind. A simple recursion technique is described for the generation of the polynomials for even- or odd-degree Chebyshev filtering functions with symmetrically or asymmetrically prescribed transmission zeros and/or group delay equalization zero pairs. The method for the synthesis of the coupling matrix for the corresponding single- or double-terminated network is then given. Finally, a novel direct technique, not involving optimization, for reconfiguring the matrix into a practical form suitable for realization with microwave resonator technology is introduced. These universal methods will be useful for the design of efficient high-performance microwave filters in a wide variety of technologies for application in space and terrestrial communication systems.

❑ Return to main document.