Abstracts

Cascade Directional Filter

O. Wing. "Cascade Directional Filter." 1959 Transactions on Microwave Theory and Techniques 7.2 (Apr. 1959 [T-MTT]): 197-201.

A directional filter is a completely matched four-port which exhibits a directional and a filter-like frequency characteristic. This paper explores the properties of N-directional filters connected in cascade through sections of transmission lines. Analysis shows that if a directional filter admits the equivalent circuit representation offered here, its transfer functions are functions of only one parameter, a susceptance function. When the directional filters are cascaded in a certain way, the overall transfer functions have the same form as before except that the susceptance function is now the sum of the susceptance functions of the component filters. The last property is an important one. Given a transfer function expressed in terms of a susceptance function, the network designer can expand the susceptance in partial fraction and realize the transfer function using directional filters in cascade, each being characterized by a much simpler susceptance.

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