Abstracts

Application of Exact Synthesis Methods to Multichannel Filter Design (Jan. 1965 [T-MTT])

R.J. Wenzel. "Application of Exact Synthesis Methods to Multichannel Filter Design (Jan. 1965 [T-MTT])." 1965 Transactions on Microwave Theory and Techniques 13.1 (Jan. 1965 [T-MTT]): 5-15.

An exact design procedure is presented for contiguous-band multichannel filters. The procedure is theoretically valid at all frequencies for filters which employ TEM-mode (transverse-electro-magnetic-mode), quarter-wave line networks. The design of diplexing is considered in detail with multichannel filters being realized as a cascade of suitable diplexers. Microwave complementary component filters are shown to fulfill the requirement for the design of diplexing and multichannel filters with theoretically perfect match at all frequencies. A design procedure using component networks with Chebyshev characteristics is given. This allows a narrow crossover region and high isolation to be obtained for a given network complexity at the cost of a slight increase in input-port VSWR (Voltage Standing-Wave Ratio). The design procedure makes use of published tables and does not require a detailed knowledge of synthesis techniques. Experimental results for two diplexing networks, one a complementary and the other a Chebyshev pair, are given in verification of the theory presented.

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