Abstracts

Efficient Design Methodology for Microwave Frequency Multiplexers Using Infinite-Array Prototype Circuits

C. Rauscher. "Efficient Design Methodology for Microwave Frequency Multiplexers Using Infinite-Array Prototype Circuits." 1994 Transactions on Microwave Theory and Techniques 42.7 (Jul. 1994, Part II [T-MTT] (Special Issue on Filters and Multiplexers)): 1337-1346.

Frequency multiplexer of the manifold type, in which individual channel filters connect to a main trunk line without the use of isolating directional circuit components, are noted for their compactness, achieved through controlled signal interactions among channel circuits. A major drawback often associated with manifold designs is the potentially large number of network variables that must be handled simultaneously. The new multiplexer design approach being presented utilizes infinite-array prototype circuits based on logarithmic-periodic principles which, in turn, allow a significant reduction in the simultaneous-variable count. The technique is not confined to manifold architectures and can accommodate both contiguous and noncontiguous channels with a wide variety of frequency band allocations. The versatility of the approach is illustrated by two experimental contiguous-band five-channel multiplexer circuits that operate at C- and X-band frequencies, with one circuit designed for equal fractional bandwidths of 20%, and the other for constant absolute bandwidths of 800 MHz. These examples are believed to represent the first practical and successful utilizations of logarithmic periodicity in microwave multiport network design.

❑ Return to main document.