Abstracts

Subminiature Microwave Active Filter Manifolds

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In May 1968, a new active filter technique was reported to be suitable for UHF and microwave applications. A previously unexploited transistor mechanism, associated with the transit time properties of a transistor, is found to yield stable inductance with extremely high Q, or even negative Q; thus allowing a single transistor to be substituted for an inductor in conventional filter designs. Alternately, one transistor can be coupled to each filter resonator to raise its Q. As a result, microwave active filters can be made extremely small without insertion loss or selectivity degradation. For example, the volume per resonator of recent UHF filter designs is approximately 0.1 cubic inches. Subminiature active filters have been tested at frequencies ranging from low-VHF to S-band. Accomplishing a significant reduction in filter size makes possible a number of useful systems, such as lossless multiplexer with large numbers of contiguous filter channels. The ability to divide a frequency band into a large manifold of adjacent channels is a useful aid in the accurate processing of broad-bandwidth signals. The purpose of this paper is to present recent development in active filter designs with remarkably improved filter performance, and to discuss the application of active filter techniques to microwave frequency multiplexing.

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