Abstracts

Quasi-elliptic compact high-power notch filters using a mixed lumped and distributed circuit

R.V. Snyder. "Quasi-elliptic compact high-power notch filters using a mixed lumped and distributed circuit." 1999 Transactions on Microwave Theory and Techniques 47.4 (Apr. 1999 [T-MTT]): 518-522.

A quasi-elliptic notch filter response is defined as one in which the ultimate stopband depth is sacrificed in favor of a faster transition from the passband to a specified minimum equiripple stopband attenuation level (i.e., steeper attenuation slope) with no increase in filter order (as compared to a Chebyshev or similar transfer function design). Such notch-filter responses can be achieved if the topology synthesized includes arbitrary frequency invariant impedances and line lengths in the main series line of filters. Using lumped approximations to the series coaxial sections but with the series sections not at 50 /spl Omega/ (for a 50-/spl Omega/ filter), it is possible to improve upon the Chebyshev-based results. The resulting network provides lower passband insertion loss, with no reduction in minimum notch depth or power handling, improved temperature performance and additional harmonic reduction. The improvements are due to the implementation of the quasi-elliptic response defined above, and are made possible by the larger range of main line impedances and line lengths available using inductors and capacitors rather than lengths of transmission line. In principle, the technique can be extended to achieve full-elliptic responses.

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