## Design of asymmetric filters with requirements in two bands of finite extension

In this paper, a general design procedure is presented for a class of filters characterized by requirements in two frequency bands, both of finite extension (one passband and one stopband). The filter structure is formed of suitable series resonators coupled through impedance inverters. The resonators also exhibit, in addition to the series resonance in the passband, a parallel resonance in the stopband. The procedure derives a suitable pole-zero distribution for the overall transfer function and determines the parameters of the equivalent resonators in order to obtain a quasi-equiripple response, both in the passband and stopband of the filter. The procedure has been implemented to design filters in rectangular waveguide; a pair of identical filters to be used in a diplexer have been designed through the procedure and fabricated in order to validate the theory.

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