Abstracts

The Quarter-Wave Transformer Prototype Circuit

L. Young. "The Quarter-Wave Transformer Prototype Circuit." 1960 Transactions on Microwave Theory and Techniques 8.5 (Sep. 1960 [T-MTT]): 483-489.

A quarter-wave transformer not only changes impedance levels, but will also behave as a band-pass filter. In practice, however, band-pass filters are usually required to terminate in equal input and output impedances. They often consist of several direct-coupled cavities, which are similar to transformers whose impedance steps have been replaced by reactive obstacles. It is demonstrated how one can synthesize a quarter-wave transformer, and then "distort" it to obtain a direct coupled cavity filter with a predictable performance. This is illustrated and confirmed by numerical examples. The method is particularly convenient to use in reverse. The quarter-wave transformer prototype is easily derived for a direct-coupled cavity filter which has already been designed by another approximate method, and thus gives an independent evaluation of its performance. If necessary, the filter can then be redesigned, as illustrated in this paper.

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