Abstracts

A Study of the Filter Properties of Single and Parallel-Coupled Dielectric-Waveguide Gratings

G.L. Matthaei, D.C. Park, Y.M. Kim and D.L. Johnson. "A Study of the Filter Properties of Single and Parallel-Coupled Dielectric-Waveguide Gratings." 1983 Transactions on Microwave Theory and Techniques 31.10 (Oct. 1983 [T-MTT]): 825-835.

Our work with gratings in dielectric image guide shows that it is distinctly advantageous to place the grating notches on the sides of the guide, or on the top of the guide, depending on the mode used. Means are discussed for modeling gratings using an equal-line-length transmission-line equivalent circuit. Excellent agreement between computed and measured bandstop frequency responses of gratings are obtained. Design relations for gratings are presented, and equations for analysis and design of parallel-coupled grating structures are derived. It is shown that a simple bandpass filter can be made from properly designed parallel-coupled gratings with distributed loads at one end. It is also shown that by use of combinations of parallel-coupled and direct-coupled gratings, multiresonator filters with Chebyshev or other characteristics can be obtained. Experimental results in agreement with computed responses are demonstrated.

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