Abstracts

Stopband performance improvement of rectangular waveguide filters using stepped-impedance resonators

M. Morelli, I. Hunter, R. Parry and V. Postoyalko. "Stopband performance improvement of rectangular waveguide filters using stepped-impedance resonators." 2002 Transactions on Microwave Theory and Techniques 50.7 (Jul. 2002 [T-MTT]): 1657-1664.

Rectangular waveguide stepped-impedance resonators (SIRs) are analyzed and employed in the design of an X-band filter with center frequency f/sub 0/ = 10 GHz and a bandwidth of 100 MHz. An attenuation of 80 dB is held up to 23.1 GHz and, compared to standard uniform-impedance-resonator filters, a reduction in length of 55 % is achieved at the expense of an increased insertion loss from 0.6 to 1.5 dB. The second resonance of the fundamental TE/sub 10/ mode can be controlled by adjusting the length and impedance ratio of each resonator. A design procedure that takes into account step discontinuities is described and applied to the design of a number of SIR filters. Finally, the presented theory is supported with experimental results.

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