Abstracts

Design of Band-Stop Filters in the Presence of Dissipation

The insertion loss vs. frequency characteristic of equal-element band-stop filters is derived for large as well as small degrees of dissipation, and for any number of resonators. These results are presented as curves for one through eight resonator filters. The equal-element band-stop filter, for small dissipation, is shown to have the lowest pass-band loss for a specified stop-band characteristic of all possible filters that can be represented by a low-pass prototype. Design procedures and examples are explained for waveguide and TEM band-stop filters. This includes selecting the optimum number of resonators, the resonator lengths, and the coupling reactance. Experimental results on C-band waveguide and UHF coaxial filters are presented; the results are in good agreement with the theory. This approach makes possible complete prediction of the filter response and results in lower pass-band loss than could be obtained with previously used approaches.

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