Abstracts

Scattering matrix approach for the design of microwave filters

R. Tascone, P. Savi, D. Trinchero and R. Orta. "Scattering matrix approach for the design of microwave filters." 2000 Transactions on Microwave Theory and Techniques 48.3 (Mar. 2000 [T-MTT]): 423-430.

A synthesis procedure, based on a distributed parameter model, for the design of microwave filters is presented in this paper. The frequency response of the filter is described in terms of the characteristic polynomial T/sub 21/=S/sub 11//S/sub 21/ where S/sub 11/ and S/sub 21/ are the scattering parameters of the filter. Starting from the desired polynomial T/sub 21/, the design scheme directly yields the scattering parameters of the various junctions, which can be realized by any kind of discontinuity. The capability of synthesizing an arbitrary frequency response allows one to introduce the concept of a "predistorted" characteristic polynomial in order to compensate for the degradations caused by multimodal interactions, frequency dispersion, etc. Comparison with measured data of a Chebyshev-like eight-pole E-plane filter confirms the validity of the method also in the presence of losses.

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