Abstracts

A 2-Step Waveguide E-Plane Filter Design Method Using the Semi-Discrete Finite Element Method (Short Papers)

D. Crawford and M. Davidovitz. "A 2-Step Waveguide E-Plane Filter Design Method Using the Semi-Discrete Finite Element Method (Short Papers)." 1994 Transactions on Microwave Theory and Techniques 42.7 (Jul. 1994, Part II [T-MTT] (Special Issue on Filters and Multiplexers)): 1407-1411.

The semidiscrete finite element method is used to design rectangular waveguide E-plane filters over a wide range of band-widths. First, a single filter element is characterized over the frequency range of interest by extracting lumped element values from the full-wave solution. A filter is then designed and optimized using the k-parameter method in which only first-order mode interaction between elements is considered. The filter response is then further refined by optimizing the full-wave response of the entire filter. This numerical technique exhibits excellent numerical convergence, with accuracy better that one percent with only 30 finite element nodes. Two filters were designed and their responses measured to verify the accuracy of the numerical technique.

❑ Return to main document.