Abstracts

Optimization of Planar Devices by the Finite Element Method

P. Garcia and J.P. Webb. "Optimization of Planar Devices by the Finite Element Method." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 48-53.

The finite element method has been shown to be an efficient and flexible way of computing the scattering parameters of N-port planar devices (microstrip. stripline, rectangular waveguide, etc.). In addition, it can provide at little extra cost the sensitivity of scattering parameters to changes in the shape of the device. Such information may be useful in itself; it also leads to a faster automatic optimization of the shape. This approach has been implemented with high-order, triangular finite elements and the Broyden-Fletcher-Goldfarb-Shanno optimization scheme. Sensitivities were computed for an empty parallel-plate waveguide and for a rectangular waveguide containing a dielectric slab the agreement with analytical solutions was excellent. The method was used to determine the optimum shape of a microslip 3 dB hybrid and was found to require far fewer analyses than a previous technique.

❑ Return to main document.