Abstracts

Rigorous Hybrid-Mode Analysis of the Transition from Rectangular Waveguide to Shielded Dielectric Image Guide

J. Strube and F. Arndt. "Rigorous Hybrid-Mode Analysis of the Transition from Rectangular Waveguide to Shielded Dielectric Image Guide." 1985 Transactions on Microwave Theory and Techniques 33.5 (May 1985 [T-MTT]): 391-401.

The transition waveguide to shielded and dielectric image guide is analyzed by the rigorous hybrid-mode field expansion technique where higher order mode coupling effects are taken into account directly, also below the corresponding cutoff frequency. The solution of the related eigenvalue problem includes waves with a complex propagation constant although the guide is assumed to be lossless. Calculated diagrams of the propagation constant as a function of frequency, as well as of the permittivity, illustrate the complicated mode conversion between evanescent modes, complex waves, backward waves, and propagating waves. For the three-dimensional scattering problem, the calculated magnitude of the input reflection coefficient agrees well with measurements, whereas the transmission-line theory applied to this structure leads to wrong results.

❑ Return to main document.