Abstracts

Field Theoretical Treatment of E-Plane Waveguide Junctions with Anisotropic Medium

Y.-Y. Tsai and A.S. Omar. "Field Theoretical Treatment of E-Plane Waveguide Junctions with Anisotropic Medium." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2164-2171.

An analysis of E-plane waveguide junctions containing an anisotropic medium is presented. The analysis is based on the equivalence principle and on cavity field expansions. Using the equivalence principle, magnetic surface currents are introduced at the imaginary boundaries chosen between the central region of the junction and the waveguides. The electric displacement D in the junction is expressed in terms of a solenoidal set while the magnetic induction B is expressed in terms of a solenoidal set and an irrotational set. Matching the tangential magnetic field at the imaginary boundaries leads to a matrix equation, the unknown of which are the amplitudes of the scattered waveguide modes. Using this method, the performance of E-plane waveguide junctions with full-height and partial-height ferrite post is analyzed. The influence of the completeness terms G/sub oq/ on the numerical results of an empty E-plane Y-junction is shown. The numerical results are compared with previously published experimental and theoretical results.

❑ Return to main document.