Abstracts

Field analysis of rectangular waveguide open junction

C.T. Iatrou and M. Cavenago. "Field analysis of rectangular waveguide open junction." 1997 Transactions on Microwave Theory and Techniques 45.2 (Feb. 1997 [T-MTT]): 165-172.

The problem of a rectangular waveguide open junction is investigated using field theory and the relevant model of two normally intersected, infinite parallel-planes waveguides. Evanescent waveguide modes generated by waveguide wall edges and/or the discontinuity in dielectric are taken into account; an infinite set of equations is derived, where the mode coupling is given by the dielectric slab modes. Proper pole handling is discussed, and a solution for the system is given. Expressions are derived for the reflected, transmitted, and radiated power, which are shown to be sufficiently reliable in the domain of practical interest, regarding the width and the dielectric loading of the gap. The analysis shows that a substantial fraction of the microwave power leaks from the dielectric gap, confirming the absolute necessity of using a choke-flange at the waveguide junction.

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