Abstracts

The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide

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In this paper, the resonance method is applied to evaluate the impedances of the equivalent network for dielectric posts symmetrically located about a reference plane in a rectangular waveguide. Explicit relationships for the impedances of the equivalent lattice network of the posts in a rectangular waveguide are given in terms of the resonant frequencies of the rectangular cavity constricted by short-circuiting the waveguide at equal distances from the reference plane. A perturbational analysis is subsequently carried out to determine the resonant frequencies for a rectangular cavity loaded with slightly lossy circular posts whose largest cross-sectional dimensions are small compared with the wavelength, Sample numerical results for a single loss-free dielectric post illustrating the application of the derived expressions are given.

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