Abstracts

Input impedance of a probe-excited semi-infinite rectangular waveguide with arbitrary multilayered loads: part II-a full-wave analysis

For pt.I see ibid., vol.43, pt.A, pp.1559-66 (July 1995). Utilizing the dyadic Green's functions (DGF's) derived in Part I of this paper, the input impedance of a coaxial probe located inside a semi-infinite rectangular waveguide has been generally formulated. The electromagnetic DGF's for a rectangular cavity with a dielectric load are also obtained from the general expressions given in Part I. Using the full-wave analysis, a dielectric-loaded rectangular cavity is further considered and the input impedance is specified. To improve the computational accuracy, an alternative form of electric DGF's of the second kind is developed and expressed in terms of the guided-wave eigenvalues for the rectangular loaded cavity. The probe-input reactance and the phase of the reflection coefficients are computed using the conventional form of electric DGF and the alternative form of magnetic DGF. Data are obtained from experiments performed on a dielectric-loaded cavity and compared with the numerical results. Agreement of the theoretical and experimental results confirms the applicability of the theoretical analysis given in this paper.

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