Abstracts

Theory of Periodic Dielectric Waveguides

S.T. Peng, T. Tamir and H.L. Bertoni. "Theory of Periodic Dielectric Waveguides." 1975 Transactions on Microwave Theory and Techniques 23.1 (Jan. 1975 [T-MTT] (Special Issue on Integrated Optics and Optical Waveguides)): 123-133.

The propagation of electromagnetic waves along open periodic, dielectric waveguides is formulated here as a rigorous and exact boundary-value problem. The characteristic field solutions are shown to be of the surface-wave or leaky-wave type, depending on the ratio of periodicity to wavelength (d/lambda). The dispersion curves and the space-harmonic amplitudes of these fields are examined for both TE and TM modes. Specific numerical examples are given for the cases of holographic layers and for rectangularly corrugated gratings; these show the detailed behavior of the principal field components and the dependence of waveguiding and leakage characteristics on the physical parameters of the periodic configuration.

❑ Return to main document.