Abstracts

Propagation of Electromagnetic Waves in Rectangular Guides Filled with a Semiconductor in the Presence of a Transverse Magnetic Field

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The characteristics of electromagnetic waves propagating in a semiconductor filled rectangular waveguide in the presence of a transverse magnetic field are studied. It is shown that only TE mode waves having y-independent field components (y being the direction of the steady magnetic field) and anomalous modes having all six field components can propagate. The propagation constant of waves characterized by a sinusoidal y dependence of fields is derived. Asymptotic expressions for the fields and the propagation constant are then obtained for the limiting case of a small external magnetic field and some recent experimental results are analyzed in this context.

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