Abstracts

Propagation Constants in Rectangular Waveguide Partially Filled with Dielectric (Correspondence)

W.L. Weeks. "Propagation Constants in Rectangular Waveguide Partially Filled with Dielectric (Correspondence)." 1959 Transactions on Microwave Theory and Techniques 7.2 (Apr. 1959 [T-MTT]): 294-294.

There is considerable current interest in the production of guided electromagnetic waves having phase velocities equal to or less than the speed of light in free space (for example, in the design of traveling-wave slot antennas and of devices involving electron traveling-wave interactions). Such phase velocities can be obtained conveniently by partially loading a rectangular waveguide with dielectric material. In antenna work particularly, because of the field configurations, it is usually desirable to place the dielectric interface so that it is parallel to the broad face of the waveguide, as indicated in Fig. 1. The calculation of phase velocities in such a waveguide has been considered in the literature, and there is published information on some of the cutoff frequencies, but (since in this case there is no convenient relationship between the cutoff frequencies and the propagation constants) there has been little detailed information available concerning the phase velocities as a function of waveguide proportions and dielectric material. Thus a compilation has been made of such information for the dominant (hybrid) mode.

❑ Return to main document.