Abstracts

Propagation Constants of Circular Cylindrical Waveguides Containing Ferrites

H.K.F. Severin. "Propagation Constants of Circular Cylindrical Waveguides Containing Ferrites." 1959 Transactions on Microwave Theory and Techniques 7.3 (Jul. 1959 [T-MTT]): 337-346.

The paper describes some results of a theoretical and experimental investigation of the propagation behavior of circular cylindrical wave guides containing longitudinally magnetized ferrite rods. As long as no concentration of the RF-magnetic field in the ferrite occurs, theoretical expressions for the propagation constants can be given by applying first-order perturbation method. Faraday rotation measurements have been made between 5000 and 7600-mcs using commercially available ferrites. Reasonable agreement between theoretical and experimental results has been found for a thin axial ferrite rod in an air-filled guide in both cases of saturated and nonsaturated ferrites. Energy concentration in the ferrite determines the propagation behavior in the partially filled waveguide. This effect can be enhanced by surrounding the ferrite rod with a dielectric tube. For a given rod diameter and permittivity of the tube there is an optimum outer diameter of the tube for which the Faraday rotation becomes maximum.

❑ Return to main document.