Abstracts

Electromagnetic-Wave Propagation in a Conducting Waveguide Loaded with a Tape Helix

H.S. Uhm. "Electromagnetic-Wave Propagation in a Conducting Waveguide Loaded with a Tape Helix." 1983 Transactions on Microwave Theory and Techniques 31.9 (Sep. 1983, Part I [T-MTT]): 704-710.

Dispersion properties of the electromagnetic (EM) waves, propagating through a tape helix located inside a waveguide, are investigated. A complete dispersion relation for the eigenfrequency omega and the axial wavenumber kappa is obtained, including influence of the outer conducting wall on the EM-wave propagation. It is shown that the fimiting case where the outer conducting wall is very close to the helix, the helix mode is nearly a straight line in the (omega, kappa) parameter space, and is independent of the width of the helix tape. Moreover, contrary to the conventional helix theory, the outer conducting wall completely eliminates the forbidden regions in the (omega, kappa) parameter space.

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