Abstracts

An Analysis of a Hybrid-Mode in a Twisted Rectangular Waveguide

H. Yabe and Y. Mushiake. "An Analysis of a Hybrid-Mode in a Twisted Rectangular Waveguide." 1984 Transactions on Microwave Theory and Techniques 32.1 (Jan. 1984 [T-MTT]): 65-71.

Analytic expressions of electromagnetic fields for the dominant hybrid-mode in a twisted rectangular waveguide are obtained. The fields exactly satisfy the boundary conditions on the guide walls in a helicoidal shape. By expanding these expressions for the fields in terms of the eigenfunctions of a straight waveguide, the hybrid-mode is found to be composed of a fundamental TE/sub 10/-mode component, accompanied with TE/sub 01/, TM/sub 21/, TE/sub 21/, and TE/sub 03/ modes, as successive higher order components. The result of the modal power calculation reveals that there exists a frequency at which the transmitting power carried in the cross-polarized TE/sub 01/-mode component just vanishes. As a limiting case of the twisted waveguide, fields in a twisted strip line are discussed also, and the existence of a propeller-like equiphase surface is shown.

❑ Return to main document.