Abstracts

Loss Increases in Multimode Rectangular Infrared Waveguides Due to Helical Deformations

M.E. Marhic. "Loss Increases in Multimode Rectangular Infrared Waveguides Due to Helical Deformations." 1982 Transactions on Microwave Theory and Techniques 30.5 (May 1982 [T-MTT]): 671-678.

The coupling coefficients for all TE/sub pq/ and TM/sub pq/ modes of multimode rectangular waveguides, caused by elementary rotations about the three axes of symmetry, are calculated in the microwave approximation. The modes b coupled to a common mode a by these independent rotations form three nonoverlapping families. Furthermore if a deformation consisting of no more than two of these rotations is considered, none of the modes b are coupled to each other by that deformation. These properties lead, in the case of mild deformations, to the formulation of a multimode coupling theory which shows that the loss increase due to such deformations can then be viewed as the result of multiple two-mode coupling. Explicit formulas are derived for the loss increase of TE/sub p0/ due to mild circular bending. Qualitative features of twists and helical deformations are also brought out.

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