Abstracts

Low-Loss Optical Branching Waveguides Consisting of Anisotropic Materials

S. Sawa, M. Geshiro and F. Takeda. "Low-Loss Optical Branching Waveguides Consisting of Anisotropic Materials." 1991 Transactions on Microwave Theory and Techniques 39.7 (Jul. 1991 [T-MTT]): 1140-1147.

Low-loss branching waveguides of the mode-conversion type consisting of anisotropic materials are proposed and their basic wave-guiding characteristics are studied by means of coupled-mode theory. Two mode-conversion sections are introduced on both input and output sides of a conventional symmetric branching waveguide. Each arm of the branching waveguides is assumed to be a single-mode slab waveguide except for the tapered section. A coupled-mode system of equations describing mode-conversion phenomena with respect to the TM mode in the branching waveguides is derived from the field expansion in terms of local normal modes. A Runge-Kutta-Gill method is used to numerically solve the coupled-mode equations. It is found that the branching waveguides proposed here suffer mode-conversion losses to a much lesser extent than conventional branching waveguides.

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