Abstracts

Coupled-mode analysis of highly asymmetric directional couplers with periodic perturbation

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This paper presents an in-depth analysis of highly asymmetric grating assisted directional couplers. The directional coupler consists of a polymer waveguide with dimensions and refractive indices closely matching a single-mode fiber fabricated atop a Ga/sub 0.6/Al/sub 0.4/As/GaAs/Ga/sub 0.4/Al/sub 0.6/As waveguide. The structure is investigated analytically by means of a new orthogonal coupled-mode theory formulated in terms of the Lorentz reciprocity theorem. For the first time, the analysis includes three distinct loss mechanisms, namely, the leakage of power toward the semiconductor substrate, the power lost to radiation modes (mode mismatching), and the grating radiation loss.

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