Abstracts

Modal Solutions of Active Dielectric Waveguides by Approximate Methods

A. Linz and J.K. Butler. "Modal Solutions of Active Dielectric Waveguides by Approximate Methods." 1982 Transactions on Microwave Theory and Techniques 30.12 (Dec. 1982 [T-MTT] (1982 Symposium Issue)): 2139-2145.

Approximate methods are used to obtain the modal properties of stripe-contact semiconductor injection lasers using a planar three-layer waveguide model. The central active layer has a dielectric constant that varies smoothly along the direction parallel to the heterojunction boundaries. The complex dielectric constant under the stripe contact is dependent on the gain and approaches a constant value at large lateral distances. The two methods are compared in terms of their modal propagation constants. An application of the effective index method facilitates a physical understanding of dielectric waveguide modes as well as providing an efficient calculation procedure.

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