Abstracts

Ultrahigh-speed traveling-wave electroabsorption modulator-design and analysis

G.L. Li, C.K. Sun, S.A. Pappert, W.X. Chen and P.K.L. Yu. "Ultrahigh-speed traveling-wave electroabsorption modulator-design and analysis." 1999 Transactions on Microwave Theory and Techniques 47.7 (Jul. 1999, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1177-1183.

Theoretical analysis and numerical calculations are presented for ultrahigh-speed (>50 GHz) traveling-wave electroabsorption modulators (TW-EAM's), including effects of velocity mismatch, impedance mismatch, and microwave attenuation. A quasi-static equivalent circuit model is used to examine the TW-EAM microwave properties, including the effect of photocurrent. Due to the optical propagation loss of the waveguide, the TW-EAM waveguide length for maximum RF link gain is currently limited to 200-300 /spl mu/m. The discussion indicates that the carrier transit time in the intrinsic layer may not severely limit the TW-EAM bandwidth. Three TW-EAM design approaches are discussed: low-impedance matching; reducing the waveguide capacitance; and distributing the modulation region.

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