Abstracts

Direct Modulation of Semiconductor Injection Lasers

P. Russer and G. Arnold. "Direct Modulation of Semiconductor Injection Lasers." 1982 Transactions on Microwave Theory and Techniques 30.11 (Nov. 1982 [T-MTT]): 1809-1821.

Narrow stripe geometry double-heterostructure injection lasers for optical communication applications allow direct modulation up into the Gbit/s range. Modulation behavior and influence of modulation on the laser spectrum are discussed. The spectral and modulation properties of gain-guided and index-guided laser types differ significantly. Limitations arise from intensity fluctuations due to intrinsic quantum noise, dynamic instabilities, and reflected optical power, and also, in the case of analog modulation, from harmonic distortion. By coherent injection locking, single mode operation and strongly damped transient response can be achieved. Electronic circuits for Gbit/s direct modulation are discussed.

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