Digest of Tech. Papers *The 14th Conf. (1982 International) on Solid State Devices, Tokyo*

B—2—1
(Invited)

"Dynamic Single-Mode Semiconductor Lasers"

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Abstract

Recently, dynamic single-mode (DSM for short) GaInAsP/InP lasers in the wavelength region of 1.5 to 1.6μm such as distributed Bragg reflector (DBR) and distributed feedback (DFB) lasers have been extensively developed for the ultra low-loss optical fiber communications. These DSM lasers can operate with single longitudinal mode under high-speed direct modulation which results in the complete reduction of the mode partition noise. As a result, large amount of the transmission capacity of the single mode optical fiber transmission system of the bandwidth-distance product of 185GHz·Km was suggested at the lowest loss wavelength region.

The art DSM lasers i.e. 1.5-1.6μm wavelength GaInAsP/InP DFB lasers, DBR-Integrated Twin Guide (DBR-ITG) lasers, and DBR-Butt Jointed Built-in (DBR-BJB) lasers are reviewed. Structure, fabrication, and static and dynamic properties of lasing characteristics of these DSM lasers are given.