Professor Meng-Chyi Wu **(**Ph.D. Electrical Engineering National Cheng Kung University, Taiwan, 1986). He has over 30 years of research experience on III-V compound semiconductors, material characterization, optoelectronic devices, and epitaxial techniques consisting of liquid-phase epitaxy, metalorganic chemical vapor deposition (MOCVD), and molecular-beam epitaxy. He is the first one to fabricate the red AlGaAs/InGaP light-emitting diodes in Taiwan, which helps the development of visible LEDs grown by MOCVD. He also fabricated the long-wavelength InGaAsP/InP and AlGaInAs/InP laser diodes (LDs), which contain ridge-waveguide, distributed feedback, and vertical surface-emitting structures, for the fiber communication applications. He also fabricated the first InGaAs/InP and InGaP/GaAs p-i-n photodiodes (PDs) with high speed (10 GHz) and enhanced wide spectral range of 0.6-1.7 um and 300-900 nm, respectively. The PDs permit the applications for high-speed communication, optical storage systems such as CD-ROM, as well as red and blue laser DVDs. In addition, he also applied this p-i-n photodiode to integrate the ruby micro-ball-lens for the alignment tolerance enhancement. Professor Wu has also developed the vertical organic thin-film transistors (OTFTs) and transparent conductive oxides for the applications on the optoelectronic devices and displays. He has published over 290 journal papers on these research fields. He is a senior member of IEEE.

Abstract

For the linear array, it is necessary to have a high yield and high uniformity in element fabrication. For example, a 30 % yield of an eight-element laser array requires the yield of each element more than 90 %. In addition, the uniformity of laser characteristics, especially in threshold current, slope efficiency, and lasing wavelength, is required to simplify the design consideration on driving circuits. One of the most important problem is crosstalk due to thermal interaction, which makes the device degradation at high driving currents and high operation temperatures and also makes it difficult to increase the number of element. Study shows that high-temperature property is much attractive to reduce thermal-cross effects on the array elements and to avoid device degradation at high driving currents for the applications of parallel optical transmission and fiber communication.