

技术及应用

InGaAsP多量子阱激光二极管及其组件的 γ 辐射效应

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收稿日期 修回日期 网络版发布日期:

摘要 本工作进行多量子阱激光二极管及其组件的 γ 辐照实验研究, 总剂量(以Si计)达 5.5×10^4 Gy。结果表明: 多量子阱激光二极管抗 γ 射线辐照能力很强, 在实验总剂量下, 裸管形式的多量子阱激光二极管的*P-I*特性、*I-V*特性及中心波长基本未变化。而多量子阱激光二极管组件因包含光学窗口、耦合透镜及光纤等附属光学元件, 这些附属元件受 γ 辐照后光学性能下降, 最终导致激光二极管组件输出光功率随总剂量增大而下降, 停止辐照后, 不需加偏置, 在室温下即能发生退火, 使得斜率效率逐渐回升。

关键词 [多量子阱激光二极管](#); [\$\gamma\$ 射线](#); [辐射效应](#)

分类号

γ -ray Radiation Effect on InGaAsP Multi-quantum Well Laser Diodes and Its Component

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Abstract Multi-quantum well laser diodes and their components were irradiated by gamma-ray up to the total ionization dose of 5.5×10^4 Gy (Si). The investigated multi-quantum well laser diodes are quite resistive to gamma-ray irradiation because their *P-I* characteristics, *I-V* characteristics and central wavelength have little changes. For laser diode component in which optical window, coupled lens and optical fiber and so on are included, its optical performance is degraded by gamma-ray irradiation. The output optical power of laser diode component decreases with total ionization dose; however, the slope efficiency increases gradually with natural annealing at room temperature without biasing after ceasing irradiation.

Key words [multi-quantum well laser diodes](#) [gamma-ray radiation effect](#)

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