

Effect of changes carrier density and temperature of the device on Threshold Current & Gain in a Quantum Well high power GaAs/AlGaAs Semiconductor laser diodes

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Abstract At this thesis analyzes threshold stream effectiveness and using GaAs/AlGaAs semiconductor high power laser according to quantum well and then designs and studies by a precise simulator called silvaco. At first calculates various energy levels in a quantum well and then explains two events mirrors destroy and filamentation as two basic problems to receive high power and provides solutions such as covering laser mirrors to increase life span and such type lasers outside power. At following introduces semiform levels position and their dependence to carriers and electrons density and then regarding to limited element method in silvaco dedigns and simulates aimed structure. Of course should make this structure as there is stability and convergence in system that causes time steps minimizing and simulation time longening but finally causes precision increasing to extract laser outside diagrams. At following to increase outside power and ommiting ordinate methods and improving structure outside curves regarding to changes number in elements components percent, simulated improved structure , and extracted and studied structure outside curves .

Keywords : Keywords : high power laser diodes, silvaco similutor, SHB , laser light severity, lourentzy follower, coposition percent

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