

عنوان مقاله:

Extending the active region of the quantum cascade laser to optimize laser output

محل انتشار:

اولین کنفرانس ملی میکرو نانو فناوری (سال: 1397)

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خلاصه مقاله:

In this paper, the quantum cascade laser was developed by active area engineering to provide the parameters of the active quantum cascade-laser region of the inhomogeneous structure of $\text{In}(x)\text{Al}(1-x)\text{As} / \text{In}(x)\text{Ga}(1-x)\text{As}$, and also to calculate the properties Output for optimal laser performance. Characteristics of interest in quantum wells laser are studied using various theoretical theories, but there are no articles that draw all the equations with all parameter values. To study the optical properties of the semiconductor device, the integration details of the interest model for a wide range of materials (all compounds mixed on group III-V) are presented. In this model, the maximum corrections presented in the text include all the parameters needed to calculate the concurrent interest. The model contains a database for parameters of all III-V semiconductor alloys including binary, triple and quaternary materials. Functions depend on temperature, carrier and photon concentration, quantum well thickness and polarization. In the model, there is the possibility of switching between one and two heterogeneous structures. Band structure results, TE and TM power consumption spectra with energy, TE and TM waveform spectra with wavelengths, TE and TM modes with energy and wavelengths. We calculated the density of states for the inhomogeneous structure of $\text{In}(x)\text{Al}(1-x)\text{As} / \text{In}(x)\text{Ga}(1-x)\text{As}$. In optimum output gain, we have achieved the proposed well width, thickness of the dam, various compounds of the alloy x and suitable electric field

کلمات کلیدی:

Laser, quantum cascade laser, quantum well, laser output, heterogeneous materials

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