

Characterization Of Quantum Cascade Lasers On Silicon

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TeraSense terahertz imaging cameraPart 3 - Quantum Cascade Lasers: Compact Widely Tailorable Light Sources from 3 to 300 μm ~~Part 2 - Quantum Cascade Lasers: Compact Widely Tailorable Light Sources from 3 to 300 μm~~ Quantum Well Laser ~~Quantum cascade laser 3rd year project~~ ~~Quantum Cascade Laser - Federico Capasso~~

Leonardo DRS and Daylight Solutions - Quantum Cascade Laser Technology Plasma Etching for Fabrication of Low Dissipation Single Mode Quantum Cascade Lasers Vacuum viewport for Quantum Cascade Lasers sales@dmphotonics.com Characterization Of Quantum Cascade Lasers

Quantum cascade lasers are semiconductor lasers that emit in the mid- to far-infrared portion of the electromagnetic spectrum and were first demonstrated by Jerome Faist, Federico Capasso, Deborah Sivco, Carlo Sirtori, Albert Hutchinson, and Alfred Cho at Bell Laboratories in 1994. Unlike typical interband semiconductor lasers that emit electromagnetic radiation through the recombination of electron-hole pairs across the material band gap, QCLs are unipolar and laser emission is achieved ...

[Quantum cascade laser - Wikipedia](#)

Characterization of Quantum Cascade Lasers on Silicon Daniel Leon-Gijon Electrical Engineer Mentors: Alexander Spott & Robert Zhang Faculty

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Advisor: Professor John E. Bowers

Characterization of Quantum Cascade Lasers on Silicon

Based on this characterization system, the characteristics of gas source MBE grown InAlAs/InGaAs/InP quantum cascade lasers, especially their thermal property, have been evaluated. The results show that in the combination of $I \sim P$, $I \sim V$ and spectral measurements at various driving pulse parameters, the thermal resistance, lasing conditions as well as spectral character of the devices could be deduced.

Characterization of InAlAs/InGaAs/InP mid-infrared quantum ...

PDF | Quantum cascade lasers are coherent light sources that rely on intrasubband transition in periodic semiconductor quantum well structures. They... | Find, read and cite all the research you ...

(PDF) Thermal characterization of quantum cascade lasers ...

Quantum Cascade Lasers (QCLs) are capable of reaching Watt level output power at room temperature, cw operation but are limited to the spectral region of above 3.5 microns. Recently, Shterengas et al fabricated type-I quantum well cascade diodes that emit below 3 microns with output power near 590 mW and improved conversion efficiency compared to single-stage type-I diodes.

Characterization of new type-I quantum well cascade lasers

Characterization of mid-infrared quantum cascade lasers . By David Patrick Burghoff. ... Quantum cascade lasers provide some of the highest output powers available for light in the mid-infrared range (from 3 to 8 μ m). As many of their applications require portability, designs that have a high wall-plug efficiency are essential, and were ...

Characterization of mid-infrared quantum cascade lasers - CORE

Because of the lack of light source in the mid-infrared range (wavelengths of 3-30 μ m), the mid-infrared quantum cascade lasers with high quality radiation are playing important roles in several research fields such as chemical and bio-chemical spectroscopy, free space gas sensing and communication.

Characterization and Theoretical Study of Mid-infrared ...

The growth and characterization of quantum cascade (QC) lasers based on InGaAs/InAlAs material system are investigated. Pronounced intersubband absorption from stacked active region of QC structure is used to monitor the wavelength of QC laser and disclose the material quality.

Growth and characterization of InGaAs/InAlAs quantum ...

Characterization of InAlAs/InGaAs/InP mid-infrared quantum cascade lasers. Zhang YG(1), Nan KJ, Li AZ. Author information: (1)State Key Laboratory of Functional Materials for Informatics, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, PR China. ygzhang@itsvr.sim.ac.cn

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Characterization of InAlAs/InGaAs/InP mid-infrared quantum ...

External cavity quantum cascade lasers (ECQCLs) provide a versatile infrared laser source for spectroscopy of molecules. Recent work in our laboratory has demonstrated rapid swept-wavelength tuning for broadband spectroscopy and sensing in both point and standoff measurements. 273227. M.

Characterization of high-explosive detonations using ...

Secondary ion mass spectrometry is applied to the depth profiling of the superlattice active region of lattice matched (0.2 μm) Al_{0.48}In_{0.52}As/In_{0.53}Ga_{0.47}As/InP quantum cascade lasers. The developed measurement procedure is capable of characterizing the quality of each individual layer in the superlattice region, including layers as thin as 0.7 nm.

Characterization of the superlattice region of a quantum ...

The experimental part reports the whole process of the mid-infrared quantum cascade lasers completed at the University of Waterloo. In summary, the design, optimization, fabrication and characterization of the mid-infrared quantum cascade lasers is verified and improved. en: dc.language.iso: en: en: dc.publisher: University of Waterloo: en: dc ...

Characterization and Theoretical Study of Mid-infrared ...

In quantum cascade lasers, the wavelength, entirely determined by quantum confinement, can be tailored from the mid-infrared to the submillimeter wave region in the same heterostructure material....

Characterization of InAlAs/InGaAs/InP mid-infrared quantum ...

The growth and characterization of quantum cascade (QC) lasers based on InGaAs/InAlAs material system are investigated. Pronounced intersubband absorption from stacked active region of QC structure is used to monitor the wavelength of QC laser and disclose the material quality.

Growth and characterization of InGaAs/InAlAs quantum ...

We have studied the current- and temperature-driven frequency tunability of quantum cascade lasers operating at 2.5 THz. The design of the active medium follows the so-called bound-to-continuum approach. One laser has a Fabry-Perot type resonator. It operates on several modes simultaneously. The other has a distributed feedback structure on top of the active medium which leads to single mode ...

Spectral characterization of terahertz quantum cascade ...

We report the time resolved characterization of Fabry-Perot quantum cascade lasers (FP-QCLs). We are developing a custom-built broadband laser source in the Mid-LWIR range by combining several high power FP-QCLs for a single snap shot application. This white light source would enable not only stand-off detection applications in a single snapshot but also new data collection modalities such as ...

Time resolved characterization of Fabry-Perot quantum ...

characterization of QCLs provides a mode for comparing different device designs, packaging geometries and con-tributes to increasing reliability and

performance of QC lasers. This paper describes the development of the instrumentation for accurate and fast evaluation of thermal characteristics of semiconductor lasers based on thermoreflectance

CCD thermoreflectance spectroscopy as a tool for thermal ...

In this paper, the frequency characteristics of a terahertz quantum-cascade laser (QCL) operating around 2.5-THz in the pulsed regime have been studied by means of a heterodyne detection by using an optically pumped molecular laser as the local oscillator. The absolute frequency of the QCL can be determined with an accuracy of 1 MHz due to the pulse-to-pulse jitter of the QCL.

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