

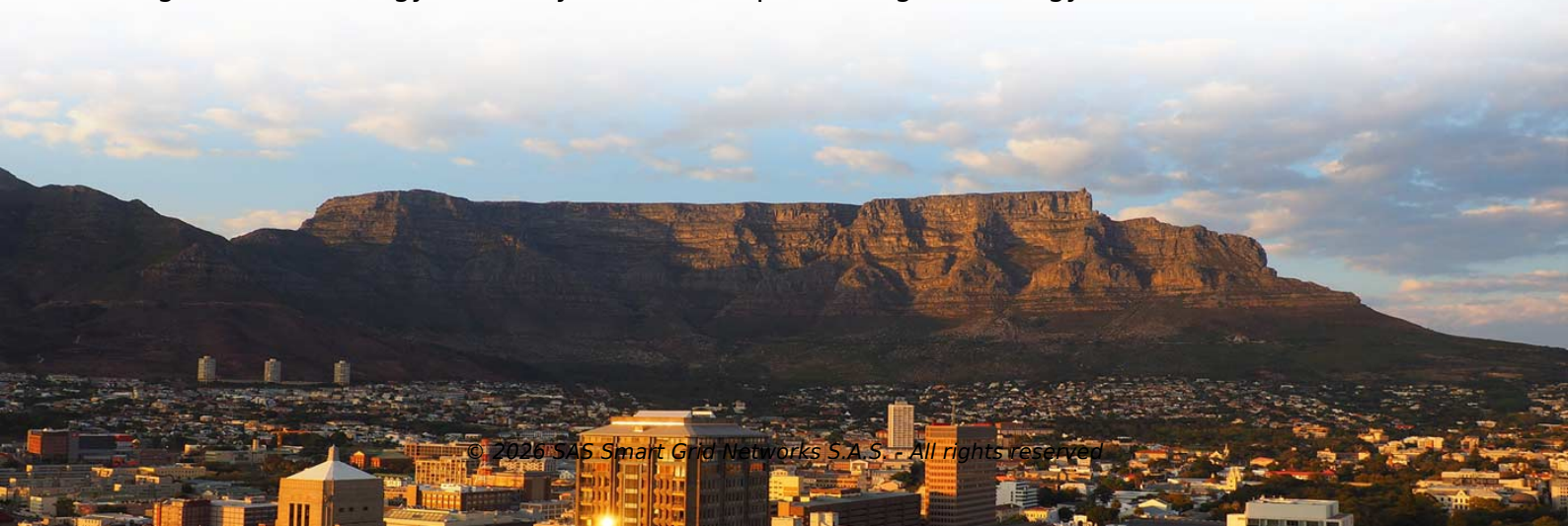
Quantum Communication Vertical-Cavity Surface-Emitting Laser 40G



Overview

The National Institute of Information and Communications Technology of Japan, in collaboration with Sony Semiconductor Solutions Corporation (Sony), has developed the world's first practical surface-emitting laser that employs quantum dot (QD) as the optical gain medium for. The National Institute of Information and Communications Technology of Japan, in collaboration with Sony Semiconductor Solutions Corporation (Sony), has developed the world's first practical surface-emitting laser that employs quantum dot (QD) as the optical gain medium for. Uncover the latest and most impactful research in Vertical-Cavity Surface-Emitting Laser Technologies for Optical Communication. Explore pioneering discoveries, insightful ideas and new methods from leading researchers in the field. How was your experience today?

Share feedback (opens in new tab). Due to their low power consumption, high modulation speed, and low cost, vertical-cavity surface-emitting lasers (VCSEL) dominate short-reach data communications as the light source. Utilization of quantum dots as an optical gain medium, enabled by NICT's high-precision crystal growth technology and Sony's advanced processing technology.



Article Content

World's First Practical Surface-Emitting Laser for Optical Fiber ...

Development of the world's first practical surface-emitting laser suitable for optical fiber communications systems. Utilization of quantum dots as an optical gain medium, enabled by NICT's

Bifurcation to nonlinear polarization dynamics and chaos in vertical ...

Abstract In this contribution we provide an in depth theoretical analysis of the bifurcations leading to nonlinear polarization dynamics in a free-running vertical-cavity surface-emitting laser

Semiconductor Laser Market Size & Share 2026

Vertical-cavity surface-emitting lasers (VCSELs) held the leading 37.8% share in 2025, propelled by smartphone facial authentication and time-of

Ultralow-threshold electrically pumped quantum-dot photonic-crystal ...

The best edge-emitting and vertical-cavity surface-emitting lasers have thresholds on the order of 100 μA (refs 1, 2), but dissipate too much power to be practical for many applications ...

Vertical-Cavity Surface-Emitting Laser Technologies for Optical ...

Find the latest research papers and news in Vertical-Cavity Surface-Emitting Laser Technologies for Optical Communication. Read stories and opinions from top researchers in our

Gabon Laser Diode Market (2025-2031) | Trends, Outlook & Forecast

Gabon Laser Diode Market Overview The laser diode market in Gabon is growing, driven by demand in various applications, including telecommunications, medical devices, and consumer electronics.

External-cavity Diode Lasers – ECDL, resonator,

External-cavity diode lasers are non-monolithic diode lasers where the laser cavity (resonator) is completed with external optical elements.

First surface-emitting laser using quantum dots targets optical fiber ...

In a joint research project with Sony, NICT has achieved the world's first electrically driven VCSEL operating at 1,550 nm—the standard wavelength for optical fiber communication—using...

A Compact High-Efficient Equivalent Circuit Model of

In this paper, we propose a versatile compact equivalent circuit model with noise effects for the MQW VCSEL. The proposed model accommodates a

Compact Vertical-External-Cavity Surface-Emitting Laser (VECSEL ...

Here we report a compact VECSEL-system (VXLTM) exhibiting a unique combination of features addressing quantum technology applications. Recent experiments demonstrating new capability for

Oman Laser Diode Market (2025-2031) | Trends, Outlook & Forecast

Oman Laser Diode Market Overview The laser diode market in Oman is expanding with applications in telecommunications, healthcare, defense, and industrial sectors for laser cutting, engraving, medical

Generation of high-power spatially-restructurable spectrally-tunable ...

Generation of high-power spatially-restructurable spectrally-tunable beams in a multi-arm-cavity vecsel-based laser system

Pixelated vertical-cavity surface-emitting laser arrays from colloidal ...

Pixelated arrays of vertical-cavity surface-emitting lasers from colloidal quantum dot thin films have been demonstrated.

Sidewall optical leakage and scaling limits in sub-20

Micro-resonant cavity light-emitting diodes (RCLEDs) are attractive for next-generation augmented reality displays and visible-light communication systems because of their superior

Vertical-cavity surface-emitting laser

VCSELs replaced edge-emitting lasers in applications for short-range fiberoptic communication such as Gigabit Ethernet and Fibre Channel, and are now used for link bandwidths from 1 to 400 gigabits per

Cryogenic High-Speed Vertical-Cavity Surface-Emitting Lasers for ...

Cryogenic computing such as superconducting computing and quantum computing is a promising alternative to handle the bottlenecks of computing power and power ef

Resonant cavity micro-LEDs with a novel metasurface ...

Metasurface-integrated vertical cavity surface-emitting lasers for programmable directional lasing emissions Article Full-text available Feb 2020 Nat. Nanotech.

Ultraviolet-C Vertical-Cavity Surface-Emitting Lasers

A low detuning maximizes the modal gain leading to a reduction of the threshold. Therefore, controlling the cavity length of VCSELs is of great

Libya Laser Diode Market (2025-2031) | Analysis & Revenue

Historical Data and Forecast of Libya Laser Diode Market Revenues & Volume By Vertical External Cavity Surface Emitting Laser (VECSEL) Diodes for the Period 2021-2031

Bulgaria Laser Diode Market (2025-2031) | Trends, Outlook & Forecast

Historical Data and Forecast of Bulgaria Laser Diode Market Revenues & Volume By Vertical External Cavity Surface Emitting Laser (VECSEL) Diodes for the Period 2021-2031

Generation of multiple low-correlation chaos signals using asymmetric ...

Xia et al. utilized the coexisting orthogonal polarization characteristics of vertical-cavity surface-emitting lasers (VCSEs) to generate four-channel chaos signals and random bits based on

Gradient moiré perovskite superlattices for laser beam steering

Here, by using a few monolayers of perovskite quantum dots, the authors demonstrate a lithography-free, vertical-emitting, single-mode laser emitting in the green.

Dr. Dharmendra KUMAR | Associate Professor | Ph.D

A theoretical analysis of the optical characteristics and polarization properties of quantum dot vertical cavity surface emitting laser (QD VCSEL) that uses inter

Semiconductor Lasers Market Trends & Outlook 2025-2035

Major players are also developing high-power diode lasers, quantum cascade lasers, and VCSELs (vertical-cavity surface-emitting lasers) for high-speed, low-energy consumption solutions.

Antireflective vertical-cavity surface-emitting laser for LiDAR

The authors showcase an innovative anti-reflective vertical-cavity surface-emitting laser (AR-VCSEL) that achieves low divergence and maintains a single-mode lasing.

Contact Us

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