

Vertical-Cavity Surface-Emitting Lasers (VCSEL) Market—Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Type (Single-Mode, Multimode VCSEL), By Material (Gallium Arsenide, Gallium Nitride, Indium Phosphide, Others), By Application (Sensing, Data Communication, Industrial Heating, Lidar, Others), By Region, and Competition

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Abstracts

Global Vertical-Cavity Surface-Emitting Lasers (VCSEL) Market is anticipated to grow at a robust pace in the forecast period, 2024-2028. The growing usage of VCSELs in 3D sensing applications, and VCSEL arrays by data centers, are the primary reasons driving the growth of this industry.

Furthermore, the expanding use of VCSELs in vehicle automation and 5G technologies presents considerable potential prospects for VCSEL Market participants. Data traffic rates in data centers have increased due to the rising use of new technologies such as Virtual/Augmented Reality (VR/AR), Artificial Intelligence (AI), and the Internet of Things (IoT). This will rise the need for high-end optical interconnect equipment, such as vertical-cavity surface-emitting lasers (VCSEL), in data centers to offer high-speed data rates of up to 400 Gbit/s. Companies are constantly developing new products to fulfil the increasing need for high-speed communication networks, creating new opportunities for market development. A semiconductor-based laser diode that produces a high-power optical laser beam vertically from its top surface is known as a Vertical Cavity Surface Emitting Laser (VCSEL). These devices, which provide a wide range of applications, notably in networks, replace edge emitting lasers (EEL). A VCSEL device runs between

850 and 1310 nm in wavelength and 2.125 and 150 Gbps in transmission rate.

The industry is likely to benefit from an increase in demand for VCSEL in data communication. Furthermore, the increased use of VCSELs in infrared lighting due to technological improvements is expected to boost market expansion. However, the VCSEL business is hampered by high costs and data range constraints. Furthermore, consumer electronics demand for VCSELs is likely to drive the VCSEL market in the future years.

Data Centers are increasing their use of VCSEL arrays

Global demand for data centers has increased due to growth in internet traffic and digital data production. The foundation of many optical networks used in data centers is multi-mode fiber and VCSELs. The connections' high data transfer rates, excellent durability, and low power consumption make them ideal for use as optical transceivers and make it possible to apply data analytics to enhance decision-making. To increase the overlapping of carriers and optical modes, intra-data center connection uses optical transceivers based on VCSELs. Due to their ability to achieve extremely high transmission bit rates and increasing the range of multi-mode fibers, they are mostly utilized in next-generation data communication applications. As a result, the demand for VCSEL arrays among data centers has increased due to the high-speed data transfer made possible by VCSELs.

Vehicle safety systems' increasing integration will boost the need for VCSEL in sensing applications.

The VCSEL market for sensing is expected to grow high in sensing applications. Fast scanning, great efficiency, and strong resistance to ambient light are all features of vertical-cavity surface-emitting lasers. They will become more popular because of these qualities in a variety of sensing applications, including gesture recognition, driver fatigue monitoring, and facial recognition, among others. In the upcoming years, market potential will be driven by the increasing electrification of cars and the integration of safety systems.

For sensing purposes in car control systems, such as call answering/hanging, audio volume adjustment, and driver tiredness monitoring, vertical-cavity surface-emitting lasers are used. There are opportunities for the sector because of some governments implementing rules and policies to incorporate safety systems in automobiles.

Market Segmentation

Global VCSEL Market is segmented By type, by material, and by application. Based on type, the market is segmented into single-mode and multimode VCSEL. Based on material, the market is segmented into Gallium Arsenide, Gallium Nitride, Indium Phosphide, Others. Based on Application into sensing, data communication, industrial heating, lidar, and others.

Market players

Major market players in the global VCSEL market are TRUMPF GmbH + Co. KG, Lumentum Holdings Inc, Broadcom Inc, Finisar Corporation, IQE PLC, Thorlabs, Inc, Ultra Communications, Inc, Vertilas GMBH, Viavi Solutions Inc, Vixar Inc.

Report Scope:

In this report, the Global VCSEL Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

VCSEL Market, By Type:

Single-Mode

Multimode VCSEL

VCSEL Market, By Material:

Gallium Arsenide

Gallium Nitride

Indium Phosphide

Others

VCSEL Market, By Application:

Sensing

Data Communication

Industrial Heating

Lidar

Others

VCSEL Market, By Region:

North America

United States

Canada

Mexico

Asia-Pacific

India

China

Japan

South Korea

Australia

Europe

Germany

United Kingdom

France

Belgium

Italy

South America

Brazil

Argentina

Colombia

Middle East & Africa

Saudi Arabia

South Africa

UAE

Israel

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global VCSEL Market.

Available Customizations:

Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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