Optical Modulators Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 121 pages | Mordor Intelligence

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Report description:

The global optical modulators market is expected to register a CAGR of 16.45% over the forecast period. The optical modulators market is witnessing a rapid growth rate due to its demand growth in multiple applications, from data centers to telecommunication.

Key Highlights
An optical modulator plays a very crucial role in fiber-optic networks. Just as a transistor acts as a switch for electronic signals, an optical modulator acts as a switch for optical signals. Optical communication primarily uses light, so the modulator's function is to turn on and off the light that sends a stream of binary signals over optical fibers.
The rising internet penetration and rapid advancements in 5G infrastructure and data center infrastructure are expected to drive the market studied during the forecast period.
Various companies have continuously undertaken various initiatives to provide enhanced services via optical communication solutions. 5G, Artificial intelligence (AI), and internet of things (IoT) applications also drive the demand for more bandwidth.
Leveraging high symbol rate systems increases the aggregate per-wavelength information rate to reduce the cost-per-bit in optical systems.
Optical modulators are one of the primary components used in optical interconnection, and their slow commercialization and balancing performance, cost, and efficiency are some of the significant challenges in the studied market.?
In the post-COVID-19 scenario, the optical modulators market is expected to be driven by the increased demand for broadband. According to FTTH Council, the number of fiber optic broadband lines in Europe is expected to double from last year's levels over the next six years as the pandemic accelerated demand for faster internet services. High-speed fiber is expected to pass 202 million houses in the European Union and Britain by the next four years, up from 88.1 million in the past three years.

Optical Modulators Market Trends

Optical Communication to Hold Significant Market Share

Optical communication is a type of communication in which light is used to carry the signal to the remote end instead of an electrical current. Optical communication relies on optical fibers to carry signals to their destinations. A modulator/demodulator, a transmitter/receiver, a light signal, and a transparent channel are the building blocks of the optical communications system.
Some major benefits of using optical communication include exceptionally low loss, high bandwidth, no electromagnetic interference, and great transmission range. Global data traffic has been growing exponentially. Ericsson and Cisco estimated that there would be more than 10 billion devices and 3 billion new 5G users in the next few years.
With the increasing number of 5G and smart devices, the demand for faster services has also been increasing. On the other hand, data traffic bottlenecks could be observed in environments such as 5G infrastructures and data centers. These problems stem from the optical connectivity between systems, such as data exchange between servers in data centers, and connections among multiple CPUs or processors in edge computing platforms, as per the Graphene Flagship, a part of the European Union's scientific research initiative.
In line with such trends, various companies have been continuously undertaking various initiatives to provide enhanced services via optical communication solutions. 5G, Artificial intelligence (AI), and internet of things (IoT) applications also drive the demand for more bandwidth. Leveraging high symbol rate systems increases the aggregate per-wavelength information rate to reduce the cost-per-bit in optical systems.
Further, optical modulators can play a substantial role in supporting the requirement for faster data rates, superior switching techniques, and more intelligent network architectures that can automatically adjust dynamically in response to traffic patterns and, simultaneously, be cost-effective. The trend is anticipated to continue as breakthroughs already attained in the laboratory will be extended to practical deployment, leading to a new generation in fiber optics communications.

Asia Pacific to Register Fastest Growth

In the Asia-Pacific region, Japan's electronic products industry, one of the largest in the world, is one of the most significant factors driving demand for optical modulators in the region.
As per the Japan Electronics and Information Technology Industries Association (JEITA), in 2021, the production value of electronic devices in Japan grew by 10.6% compared to the previous year, reaching a value of about JPY 3.94 trillion (~USD 29.564 billion) in 2021.
The rising disposable income of the people and their preferences for smart homes and smart business environments are important drivers for the growth of consumer electronics in Japan. The increasing demand for consumer electronics in the region is expected to promote the need for optical modulators.
The growing concerns about increasing energy consumption in the region are one of the primary factors driving the growth of the market. Smart buildings can significantly reduce energy costs through real-time adjustments of heating, cooling, lighting, and other systems based on changes in weather and building occupancy. Due to their capability to be monitored and adjusted remotely, smart facilities reduce carbon footprints while resulting in energy cost savings.
According to the Ministry of Industry and Information Technology (MIIT), China aims to have 2 million installed 5G base stations in 2022 to expand the country's next-generation mobile network. The Chinese mainland currently has 1.425 million installed 5G base stations that support more than 500 million 5G users nationwide, making it the biggest network in the world, as per MIIT. The growing implementation of 5G in the region is also expected to promote the demand for 5G-enabled devices, thereby increasing the need for optical modulators in the APAC region.

Moreover, as per the China Academy of Information and Communications (CAICT), China's shipments of smartphones compatible with 5G networks rose by 63.5% to 266 million in 2021. Further, 5G smartphone shipments accounted for 75.9% of domestic shipments, higher than a global average of 40.7%. Such trends will accelerate the demand for optical modulation solutions.

Optical Modulators Market Competitor Analysis

The Optical Modulators market is highly fragmented due to the presence of both global players and small and medium-sized enterprises. The major players in the market are Thorlabs Inc., Lumentum Holdings Inc., AA Opto-Electronic, Fujitsu Optical Components Limited, and Gooch & Housego PLC. Players in the market are adopting strategies such as partnerships and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

October 2022 - Lumentum Holdings Inc. announced that it had developed its manufacturing operations and advanced R&D in Skoflijica, Slovenia, for its specialty optical fibers, which are vital components of many Lumentum products. With this expansion, the company could more than double its manufacturing and R&D footprint in Slovenia.
March 2022 - Fujitsu Optical Components Ltd announced that it is LN analog semiconductor modulator had received the Ministry of Economy, Trade and Industry's 2021 supplementary "Industrial Technology Practical Development Project Expense Subsidy (highly essential for supply chains)." As a result, the government would provide financial support to the enterprise for the costs associated with the introduction of new products.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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