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Photonic Integrated Circuit Market Research Report - Global Forecast till 2030

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Description:

Photonic Integrated Circuit Market Overview

The Global Photonic Integrated Circuit Market is expected to reach USD 27.42 Billion by the end of the forecast period 2022-2030, with a CAGR of 20.47%.

A circuit consists of photonic sensors and electronic components which use lights/photons to operate and perform operations is a Photonic Integrated Circuit which is similar to an integrated electronic circuit. These PIC circuits use high-speed photons as data carriers over low-speed electrons. Due to this facility, the PIC included devices can transfer large amounts of data with high speed and efficiency which makes it a favorable technology among the users. PIC circuits are seen in various applications like Calorimetry, Lidars, Nanoelectronics, and silicon-based technologies.

During the functioning of a PIC, the signals are processed by integrating visible and infrared wavelengths ranging from 800nm to 1700nm. In the conversion of the light signals into electric form, the photonic sensors played a major role in the PIC. The benefits behind the PIC are high power optimization, low heat dissipation, compact system size, minimal cost, reliability, and high level of component integration are increasing the market growth. Photonics ICs can be used generally in the sectors of defense, healthcare, optical fiber communications, quantum integration, quantum simulation, and quantum metrology. According to the report of the UN specialized agency for ICTs, "ICT Data and Statistics Division", nearly 48% of the world population use the internet and the usage is growing rapidly at a remarkable rate.

COVID-19 Analysis:

Even though the COVID-19 outbreak spread in most of the regions in the world and the countries like Germany, Spain, Saudi Arabia, and the U.K are still suffering from the impact of the pandemic. Most of the business sectors are almost fallen their demand for their products. But the Photonic integrated circuit market is positively impacted by the COVID-19 situation. The manufacturing companies of the photonic integrated circuits are taken this pandemic situation as an opportunity and developed a new device, a Point-of-Care testing device that offers quick and reliable detection of a patient, whether he is infected using virus receptors.Most businesses face the challenges of supply chain disruptions and volatile demand. However, the PIC market and semiconductor industry are away from the devastating effects of the coronavirus outbreak. Hence this pandemic situation impacts positively and gives opportunity to develop their devices.

Market Dynamics:

Drivers:

The factors driving the photonic integrated circuit market growth are the miniaturization of devices and the rise in the level of integration. High-speed data transmission is possible with this circuit which makes it suitable for a wide range of applications like industrial, aerospace, telecommunication, utilities, and energy sectors which plays as a major driver of the photonic IC market. The testing phase of 5G technology is anticipated to accelerate market growth.

There is a high demand for quantum computing and optical fiber sensing applications for photonic integrated circuits. The simple photonic integrated circuit design with less energy consumption, smaller and faster, efficient & ecofriendly products are the benefits provided by the photonic integrated circuit companies. Low cost due to miniaturization, compact size by integrating a large number of components and functions on a single chip, higher power efficiency compared to electronic IC's are the advantages of the photonic integrated circuits.

Restraint:

High assembly costs are hampering the market. Nearly 50% of the total devices costs are contributed by electrical and optical packaging which is the major restraint of the photonic integrated circuit market. To overcome this problem, innovation centers like Chip Integration Technology Center (CITC) increases their efforts to remove these barriers and provides heterogeneous integration and advanced packaging for photonic integrated circuits (PIC). Lack of digitalization and lack of awareness regarding advanced packaging techniques is hindering the growth of the market.

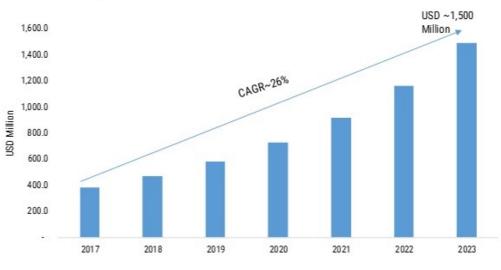
Opportunities:

The advanced developments and innovations in the photonics and fiber optics field accelerate the market growth. Growing demand for high-speed and efficient data transmission in data centers is offering opportunities for the growth of the market. The factors that provide an opportunity to increase the growth of the photonic IC market are the increasing need for improved communication & computation needs, flexible, miniaturized, and power-efficient circuits.

Challenges:

Thermal effect issues, lack of skilled technicians to operate the fabrication units, need for high initial investments are the challenging factors of the market.

Global Photonic Integrated Circuit Market, USD Million



Source: MRFR AnalysisSegment Overview:

The global photonic integrated circuit market has been divided into segments based on integration type, application, component, and region.

Based on Type

Based on integration type, the photonic integrated circuit market segments into three types as hybrid, monolithic, and module.

Based on component

The photonic integrated circuit market industry based on components is classified into lasers, modulators, photodetectors, attenuators, and optical amplifiers. Among them, the laser segment dominates the photonic integrated circuit market share due to its wide usage in applications like telecommunication and data centers. Lasers provide enhanced optical power, spectral purity, and temperature range.

Based on application

The photonic integrated circuit market companies based on application are bifurcated into optical fiber communication, optical fiber sensor, biomedical, quantum computing, and others. The optical fiber communication segment holds the largest market share for its efficiency in handling increasing data traffic, high bandwidth, and low signal attenuation.

Based on Region

Photonic integrated circuit market based on region sub-segmented into four main regions like North America, Europe, Asia-Pacific, and rest of the world. Among all these, North America dominates the market because of the high number of developments in integrated circuits and sensors.

Regional Analysis -

Regionally, the photonic integrated circuits market is divided into North America, Europe, Asia-Pacific, and the rest of the world. North America dominates the photonic integrated circuit market share for the presence of a high number of advanced developments in circuits and sensors. Growing demand for a higher level of integration, high investments by the governments, a growing number of data centers, increasing the benefits of PICs, and advanced technologies are boosting the market growth in this region. **Competitive Landscape**

The prominent key players in the photonic integrated circuit market trends are the following:

- Agilent Technologies, Inc. (US)
- · Aifotec AG (Germany)
- Alcatel-Lucent SA (France)
- · Broadcom Inc. (US)
- Ciena Corporation (US)
- CyOptics Inc. (US)
- EMCORE Corporation (US)
- Enablence Technologies Inc. (Canada)
- Finisar Corporation (US)
- Hewlett-Packard Company (US)

- Infinera Corporation (US)
- Intel Corporation (US)
- JDS Uniphase Corporation (US)
- Kaiam Corporation (US)
- Mellanox Technologies Ltd (US)
- Luxtera Inc. (US)
- NeoPhotonics Corp (US)
- Oclaro Inc. (US)
- OneChip Photonics Inc. (US)
- TE Connectivity (Switzerland) and others

Recent Developments

- In October 2020, one of the major key player's POET Technologies has signed an agreement with the world's leading producer of LEDs, Sanan IC for a USD 50 million Joint Venture Agreement and also applied for the registration of Super Photonics Xiamen's Co.Ltd. It is expected to provide new generation optical engines which are costeffective and high-performance. These are offered globally to systems suppliers, data center operators, transceiver module manufacturers, and network providers.
- In December 2020, at the Intel Labs Virtual event, Intel announced a
 prototype that has features like the tight coupling of photonics and
 CMOS technologies with core compute silicon which acts as a proof
 for the future full integration of optical photonics.
- In November 2018, one of the dominating company Broadcom announced its first launch which is useful in data centers and cloud infrastructures, named as the industry's first 7-nm 400G PAM-4 PHY-enabling sub-8W optical modules.

Report Overview:

This global photonic integrated circuit market research includes the Market Overview, COVID-19 analysis, Market Dynamics, Study Objectives, Segment Overview, Regional Analysis, Competitive Landscape, Recent developments, Segmentation Table, and FAQs. The market scenario includes the photonic integrated circuit market drivers, restraints, challenges, and opportunities. The photonic integrated circuit forecast segments are type, component, application, and region.

Segmentation Table

The photonic integrated circuit market trends have been segmented globally based on the type, component, application, and region.

Ву Туре

Hybrid, monolithic, and module.

By component

Lasers, modulators, photodetectors, attenuators, and optical amplifiers.

By application

Optical fiber communication, biomedical, quantum computing, optical fiber sensor, and others are some of the major applications.

By RegionAsia-Pacific, Europe, North America, and the rest of the world are the four main geographies included in this market.

Study Objectives -

- To provide detailed information about the photonic integrated circuit market structure along with various forecast segments and subsegments for the next 10 years.
- To provide the factors that are affecting the growth of the Photonic Integrated Circuit market value.
- To analyze the photonic integrated circuit market industry analysis based on porter's five force analysis, factors-price analysis, supply chain analysis, etc.
- To provide history and forecast revenue segments and subsegments of the main geographies' photonic integrated circuit market

revenue.

Contents

- To provide the country-level analysis of the current photonic integrated circuit market size and future prospective.
- To provide country-level analysis of the photonic integrated circuit market industry growth by region, form, and application.
- To provide a strategic profile of the prominent key players in the market, analyze their core competencies, and draw a global photonic integrated circuit market growth landscape.
- To track and analyze new product developments, strategic alliances, and global photonic integrated circuit market research.

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