

### Photonic Integrated Circuit (PIC) Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

https://marketpublishers.com/r/P115AEA535EBEN.html

Date: April 2025 Pages: 192 Price: US\$ 4,850.00 (Single User License) ID: P115AEA535EBEN

### **Abstracts**

The Global Photonic Integrated Circuit Market was valued at USD 14.6 billion in 2024 and is estimated to grow at a CAGR of 20.6% to reach USD 98.6 billion by 2034. The explosive growth of artificial intelligence (AI) and machine learning (ML) applications, especially across data centers, continues to fuel market expansion. High-performance computing demands have surged to new heights, exposing the limitations of traditional electronic components. Photonic circuits, offering superior bandwidth and energy efficiency, have emerged as the ideal solution to address these next-generation computing requirements. Governments, tech companies, and research institutions worldwide are ramping up investments in photonics research and development, recognizing the transformative role this technology will play across industries.

In sectors like telecommunications, photonics is enabling faster data transmission and building the foundation for ultra-efficient networking systems. In healthcare, photonicsbased innovations in imaging and diagnostics are reshaping patient care and clinical workflows. The growing focus on 5G networks, quantum computing, autonomous vehicles, and optical sensing is further broadening the market's application landscape, strengthening the global push toward photonic innovation. As industries aim for faster, more reliable, and energy-efficient systems, PICs are positioned at the heart of technological evolution, unlocking new possibilities for businesses and consumers alike.

The photonic integrated circuit market is segmented by integration type into monolithic, hybrid, and module integration. Monolithic integration, valued at USD 5.2 billion in 2024, is driving major industry advancements by enabling the integration of all photonic components onto a single substrate like Indium Phosphide (InP). This approach drastically reduces interconnect losses, boosts overall system performance, and lowers



production costs. Monolithic PICs are especially crucial for high-speed transceivers and optical processors, delivering the compact, scalable solutions demanded by industries such as telecommunications and data communications. With the growing emphasis on efficient production, minimal space requirements, and reliable high-speed performance, monolithic integration is expected to maintain strong momentum through the forecast period.

Component-wise, the market includes modulators, lasers, photodetectors, multiplexers/demultiplexers, waveguides, attenuators, optical amplifiers, and other critical parts. Among these, lasers play a pivotal role and are expected to generate USD 21 billion by 2034. Lasers based on InP are becoming indispensable across photonic integrated circuits, offering essential coherent light sources needed for high-speed optical communications, fiber optics, and LIDAR systems. Their seamless integration capabilities enhance system scalability and performance, helping industries meet the increasing demand for high-bandwidth applications.

The U.S. photonic integrated circuit market is on track to reach USD 25.4 billion by 2034, powered by a strong ecosystem of technology giants, research initiatives, and deep investments in silicon photonics. Companies like Intel, Cisco, and Rockley Photonics are leading innovations across optical communication, data centers, and healthcare diagnostics. Initiatives like the National Photonics Initiative (NPI) are further accelerating commercialization efforts in critical sectors such as defense, aerospace, and biomedical applications.

Leading players in the global photonic integrated circuit industry include Intel Corporation, Cisco Systems, Inc., Infinera Corporation, and Broadcom Inc. To strengthen their market presence, these companies are expanding product portfolios, forming strategic partnerships with tech firms and research bodies, and investing heavily in R&D to push photonics performance in AI and telecom networks. Many are also acquiring smaller, specialized photonic technology firms to fast-track innovation and secure a competitive edge in emerging markets.



### Contents

#### CHAPTER 1 METHODOLOGY AND SCOPE

- 1.1 Market scope and definitions
- 1.2 Research design
- 1.2.1 Research approach
- 1.2.2 Data collection methods
- 1.3 Base estimates and calculations
- 1.3.1 Base year calculation
- 1.3.2 Key trends for market estimation
- 1.4 Forecast model
- 1.5 Primary research and validation
  - 1.5.1 Primary sources
  - 1.5.2 Data mining sources

#### CHAPTER 2 EXECUTIVE SUMMARY

2.1 Industry 360° synopsis

#### **CHAPTER 3 INDUSTRY INSIGHTS**

- 3.1 Industry ecosystem analysis
- 3.2 Trump administration tariffs
  - 3.2.1 Impact on trade
    - 3.2.1.1 Trade volume disruptions
    - 3.2.1.2 Retaliatory measures
  - 3.2.2 Impact on the industry
  - 3.2.2.1 Supply-side impact (raw materials)
    - 3.2.2.1.1 Price volatility in key materials
    - 3.2.2.1.2 Supply chain restructuring
    - 3.2.2.1.3 Production cost implications
  - 3.2.2.2 Demand-side impact (selling price)
    - 3.2.2.2.1 Price transmission to end markets
    - 3.2.2.2.2 Market share dynamics
  - 3.2.2.3 Consumer response patterns
  - 3.2.3 Key companies impacted
  - 3.2.4 Strategic industry responses
  - 3.2.4.1 Supply chain reconfiguration





- 3.2.4.2 Pricing and product strategies
- 3.2.4.3 Policy engagement
- 3.2.5 Outlook and future considerations
- 3.3 Industry impact forces
  - 3.3.1 Growth drivers
    - 3.3.1.1 Data center expansion & high speed communication demand
    - 3.3.1.2 Advancements in silicon photonics
    - 3.3.1.3 Growing use in healthcare & biosensing
    - 3.3.1.4 Demand for 5g & next-gen telecom infrastructure
    - 3.3.1.5 Government & defense funding for photonics R&D
  - 3.3.2 Industry pitfalls and challenges
    - 3.3.2.1 High initial capital investment & fabrication complexity
    - 3.3.2.2 Lack of standardization across PIC platforms
- 3.4 Growth potential analysis
- 3.5 Regulatory landscape
- 3.6 Technology landscape
- 3.7 Future market trends
- 3.8 Gap analysis
- 3.9 Porter's analysis
- 3.10 PESTEL analysis

#### **CHAPTER 4 COMPETITIVE LANDSCAPE, 2024**

- 4.1 Introduction
- 4.2 Company market share analysis
- 4.3 Competitive analysis of major market players
- 4.4 Competitive positioning matrix
- 4.5 Strategy dashboard

# CHAPTER 5 MARKET ESTIMATES & FORECAST, BY INTEGRATION TYPE, 2021 - 2034 (USD MILLION AND UNITS)

- 5.1 Monolithic integration
- 5.2 Hybrid integration
- 5.3 Module integration

# CHAPTER 6 MARKET ESTIMATES & FORECAST, BY COMPONENT, 2021 - 2034 (USD MILLION AND UNITS)

Photonic Integrated Circuit (PIC) Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2...



- 6.1 Lasers
- 6.2 Modulators
- 6.3 Photodetectors
- 6.4 Waveguides
- 6.5 Multiplexers/demultiplexers
- 6.6 Attenuators
- 6.7 Optical amplifiers
- 6.8 Others

### CHAPTER 7 MARKET ESTIMATES & FORECAST, BY MATERIAL, 2021 - 2034 (USD MILLION AND UNITS)

- 7.1 Indium phosphide (InP)
- 7.2 Silicon-on-insulator (SOI)
- 7.3 Silicon photonics
- 7.4 Gallium arsenide (GaAs)
- 7.5 Lithium niobate
- 7.6 Others

# CHAPTER 8 MARKET ESTIMATES & FORECAST, BY APPLICATION, 2021 - 2034 (USD MILLION AND UNITS)

- 8.1 Optical communication
- 8.2 Sensing
- 8.3 Biophotonics
- 8.4 Optical signal processing
- 8.5 Quantum computing
- 8.6 Others

# CHAPTER 9 MARKET ESTIMATES & FORECAST, BY END USE, 2021 - 2034 (USD MILLION AND UNITS)

- 9.1 Telecommunications
- 9.2 Data centers
- 9.3 Consumer electronics
- 9.4 Healthcare & life sciences
- 9.5 Defense & aerospace
- 9.6 Industrial
- 9.7 Automotive

Photonic Integrated Circuit (PIC) Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2...



9.8 Others

### CHAPTER 10 MARKET ESTIMATES AND FORECAST, BY REGION, 2021 - 2034 (USD MILLION AND UNITS)

10.1 Key trends 10.2 North America 10.2.1 U.S. 10.2.2 Canada 10.3 Europe 10.3.1 Germany 10.3.2 UK 10.3.3 France 10.3.4 Spain 10.3.5 Italy 10.3.6 Netherlands 10.4 Asia Pacific 10.4.1 China 10.4.2 India 10.4.3 Japan 10.4.4 Australia 10.4.5 South Korea 10.5 Latin America 10.5.1 Brazil 10.5.2 Mexico 10.5.3 Argentina 10.6 Middle East and Africa 10.6.1 Saudi Arabia 10.6.2 South Africa 10.6.3 UAE

#### **CHAPTER 11 COMPANY PROFILES**

- 11.1 Intel Corporation
- 11.2 Infinera Corporation
- 11.3 Cisco Systems, Inc.
- 11.4 Broadcom Inc.
- 11.5 NeoPhotonics Corporation
- 11.6 Lumentum Holdings Inc.



- 11.7 II-VI Incorporated
- 11.8 Coherent Corp.
- 11.9 Acacia Communications
- 11.10 Enablence Technologies Inc.
- 11.11 HPE
- 11.12 Mellanox Technologies
- 11.13 Luxtera
- 11.14 Rockley Photonics
- 11.15 POET Technologies Inc.
- 11.16 Ciena Corporation
- 11.17 Alcatel-Lucent
- 11.18 Fujitsu Optical Components
- 11.19 IBM Corporation
- 11.20 STMicroelectronics
- 11.21 Hewlett Packard Labs
- 11.22 TE Connectivity
- 11.23 VLC Photonics (a Hitachi Group company)
- 11.24 Effect Photonics



#### I would like to order

Product name: Photonic Integrated Circuit (PIC) Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

Product link: https://marketpublishers.com/r/P115AEA535EBEN.html

Price: US\$ 4,850.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

### Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <u>https://marketpublishers.com/r/P115AEA535EBEN.html</u>