

Photonic Integrated Circuit Global Market Insights 2025, Analysis and Forecast to 2030, by Manufacturers, Regions, Technology, Application, Product Type

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Abstracts

Photonic Integrated Circuit Market Summary

Introduction and Market Overview

Photonic Integrated Circuits (PICs), enabling high-speed data transfer using light, are critical in telecommunications, data centers, and biomedical applications. With global 5G investments reaching USD 400 billion in 2023, PICs support high-bandwidth needs. The rise of cloud computing and precision medicine further drives demand. The global PIC market is estimated at USD 10.0-15.0 billion in 2025, with a CAGR of 7%-12% through 2030, fueled by connectivity demands and technological advancements.

Regional Market Trends

North America: The U.S. and Canada lead with data center and biomedical applications.

Europe: Germany and Netherlands focus on telecommunications and photonics innovation.

Asia Pacific: China, Japan, and South Korea see growth in 5G and data centers.

Rest of the World: Brazil and India expand with rising connectivity needs.

Application Analysis



Telecommunications: Expected growth of 8%-13%, driven by 5G and fiber optics. Trends focus on high-speed connectivity.

Biomedical: Projected growth of 7%-12%, valued for diagnostics. Trends emphasize precision medicine.

Data Centers: Anticipated growth of 8%-14%, used for high-bandwidth processing. Trends highlight energy efficiency.

Others: Growth of 6%-10%, including sensing, with a focus on innovation.

Type Analysis

III-V Material: Expected growth of 8%-13%, preferred for high-performance PICs. Trends focus on scalability.

Lithium Niobate: Projected growth of 7%-11%, valued for optical modulation. Trends emphasize precision.

Silica-on-silicon: Anticipated growth of 6%-10%, used for cost-effective solutions. Trends highlight integration.

Others: Growth of 5%-9%, including hybrid materials, with a focus on emerging technologies.

Key Market Players

Lumentum Operations: Markets PICs for telecommunications.

POET Technologies, Coherent, Infinera Corporation, Intel Corporation, Cisco Systems, Source Photonics, Huawei Technologies, EFFECT PHOTONICS, ANSYS: Focus on high-speed and energy-efficient PIC solutions.

Porter's Five Forces Analysis

Threat of New Entrants: Low, due to high R&D and fabrication barriers.

Threat of Substitutes: Moderate, with electronic circuits as alternatives.



Bargaining Power of Buyers: Moderate, due to specialized applications.

Bargaining Power of Suppliers: High, due to limited high-purity material sources.

Competitive Rivalry: High, driven by innovation in speed and efficiency.

Market Opportunities and Challenges

Opportunities:

Leveraging USD 400 billion 5G market for PICs in telecommunications.

Targeting data center and biomedical growth.

Innovating with scalable and energy-efficient PICs.

Expanding into emerging markets like China and India.

Challenges:

High costs of R&D and fabrication for PICs.

Competing with traditional electronic circuits Dotting circuits.

Addressing scalability issues in photonics.

Navigating strict telecommunications regulations.

Managing supply chain disruptions for materials.



Contents

Table of Content

CHAPTER 1 EXECUTIVE SUMMARY

CHAPTER 2 ABBREVIATION AND ACRONYMS

CHAPTER 3 PREFACE

3.1 Research Scope3.2 Research Sources3.2.1 Data Sources3.2.2 Assumptions3.3 Research Method

CHAPTER 4 MARKET LANDSCAPE

- 4.1 Market Overview
- 4.2 Classification/Types
- 4.3 Application/End Users

CHAPTER 5 MARKET TREND ANALYSIS

- 5.1 Introduction
- 5.2 Drivers
- 5.3 Restraints
- 5.4 Opportunities
- 5.5 Threats

CHAPTER 6 INDUSTRY CHAIN ANALYSIS

- 6.1 Upstream/Suppliers Analysis
- 6.2 Photonic Integrated Circuit Analysis
 - 6.2.1 Technology Analysis
 - 6.2.2 Cost Analysis
 - 6.2.3 Market Channel Analysis
- 6.3 Downstream Buyers/End Users



CHAPTER 7 LATEST MARKET DYNAMICS

- 7.1 Latest News
- 7.2 Merger and Acquisition
- 7.3 Planned/Future Project
- 7.4 Policy Dynamics

CHAPTER 8 TRADING ANALYSIS

- 8.1 Export of Photonic Integrated Circuit by Region
- 8.2 Import of Photonic Integrated Circuit by Region
- 8.3 Balance of Trade

CHAPTER 9 HISTORICAL AND FORECAST PHOTONIC INTEGRATED CIRCUIT MARKET IN NORTH AMERICA (2020-2030)

- 9.1 Photonic Integrated Circuit Market Size
- 9.2 Photonic Integrated Circuit Demand by End Use
- 9.3 Competition by Players/Suppliers
- 9.4 Type Segmentation and Price
- 9.5 Key Countries Analysis
 - 9.5.1 United States
 - 9.5.2 Canada
 - 9.5.3 Mexico

CHAPTER 10 HISTORICAL AND FORECAST PHOTONIC INTEGRATED CIRCUIT MARKET IN SOUTH AMERICA (2020-2030)

- 10.1 Photonic Integrated Circuit Market Size
- 10.2 Photonic Integrated Circuit Demand by End Use
- 10.3 Competition by Players/Suppliers
- 10.4 Type Segmentation and Price
- 10.5 Key Countries Analysis
 - 10.5.1 Brazil
 - 10.5.2 Argentina
 - 10.5.3 Chile
 - 10.5.4 Peru

CHAPTER 11 HISTORICAL AND FORECAST PHOTONIC INTEGRATED CIRCUIT



MARKET IN ASIA & PACIFIC (2020-2030)

- 11.1 Photonic Integrated Circuit Market Size
- 11.2 Photonic Integrated Circuit Demand by End Use
- 11.3 Competition by Players/Suppliers
- 11.4 Type Segmentation and Price
- 11.5 Key Countries Analysis
 - 11.5.1 China
 - 11.5.2 India
 - 11.5.3 Japan
 - 11.5.4 South Korea
 - 11.5.5 Southest Asia
 - 11.5.6 Australia

CHAPTER 12 HISTORICAL AND FORECAST PHOTONIC INTEGRATED CIRCUIT MARKET IN EUROPE (2020-2030)

- 12.1 Photonic Integrated Circuit Market Size
- 12.2 Photonic Integrated Circuit Demand by End Use
- 12.3 Competition by Players/Suppliers
- 12.4 Type Segmentation and Price
- 12.5 Key Countries Analysis
 - 12.5.1 Germany
 - 12.5.2 France
 - 12.5.3 United Kingdom
 - 12.5.4 Italy
 - 12.5.5 Spain
 - 12.5.6 Belgium
 - 12.5.7 Netherlands
 - 12.5.8 Austria
 - 12.5.9 Poland
 - 12.5.10 Russia

CHAPTER 13 HISTORICAL AND FORECAST PHOTONIC INTEGRATED CIRCUIT MARKET IN MEA (2020-2030)

- 13.1 Photonic Integrated Circuit Market Size
- 13.2 Photonic Integrated Circuit Demand by End Use
- 13.3 Competition by Players/Suppliers



- 13.4 Type Segmentation and Price
- 13.5 Key Countries Analysis
 - 13.5.1 Egypt
 - 13.5.2 Israel
 - 13.5.3 South Africa
- 13.5.4 Gulf Cooperation Council Countries
- 13.5.5 Turkey

CHAPTER 14 SUMMARY FOR GLOBAL PHOTONIC INTEGRATED CIRCUIT MARKET (2020-2025)

- 14.1 Photonic Integrated Circuit Market Size
- 14.2 Photonic Integrated Circuit Demand by End Use
- 14.3 Competition by Players/Suppliers
- 14.4 Type Segmentation and Price

CHAPTER 15 GLOBAL PHOTONIC INTEGRATED CIRCUIT MARKET FORECAST (2025-2030)

- 15.1 Photonic Integrated Circuit Market Size Forecast
- 15.2 Photonic Integrated Circuit Demand Forecast
- 15.3 Competition by Players/Suppliers
- 15.4 Type Segmentation and Price Forecast

CHAPTER 16 ANALYSIS OF GLOBAL KEY VENDORS

- 16.1 Lumentum Operations
- 16.1.1 Company Profile
- 16.1.2 Main Business and Photonic Integrated Circuit Information
- 16.1.3 SWOT Analysis of Lumentum Operations

16.1.4 Lumentum Operations Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

- 16.2 POET Technologies
- 16.2.1 Company Profile
- 16.2.2 Main Business and Photonic Integrated Circuit Information
- 16.2.3 SWOT Analysis of POET Technologies

16.2.4 POET Technologies Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

16.3 Coherent



16.3.1 Company Profile

16.3.2 Main Business and Photonic Integrated Circuit Information

16.3.3 SWOT Analysis of Coherent

16.3.4 Coherent Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

16.4 Infinera Corporation

16.4.1 Company Profile

16.4.2 Main Business and Photonic Integrated Circuit Information

16.4.3 SWOT Analysis of Infinera Corporation

16.4.4 Infinera Corporation Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

16.5 Intel Corporation

16.5.1 Company Profile

16.5.2 Main Business and Photonic Integrated Circuit Information

16.5.3 SWOT Analysis of Intel Corporation

16.5.4 Intel Corporation Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

16.6 Cisco Systems

16.6.1 Company Profile

16.6.2 Main Business and Photonic Integrated Circuit Information

16.6.3 SWOT Analysis of Cisco Systems

16.6.4 Cisco Systems Photonic Integrated Circuit Sales, Revenue, Price and Gross Margin (2020-2025)

Please ask for sample pages for full companies list



Tables & Figures

TABLES AND FIGURES

Table Abbreviation and Acronyms List Table Research Scope of Photonic Integrated Circuit Report Table Data Sources of Photonic Integrated Circuit Report Table Major Assumptions of Photonic Integrated Circuit Report Figure Market Size Estimated Method **Figure Major Forecasting Factors Figure Photonic Integrated Circuit Picture** Table Photonic Integrated Circuit Classification Table Photonic Integrated Circuit Applications List Table Drivers of Photonic Integrated Circuit Market Table Restraints of Photonic Integrated Circuit Market Table Opportunities of Photonic Integrated Circuit Market Table Threats of Photonic Integrated Circuit Market Table Covid-19 Impact For Photonic Integrated Circuit Market Table Raw Materials Suppliers List Table Different Production Methods of Photonic Integrated Circuit Table Cost Structure Analysis of Photonic Integrated Circuit Table Key End Users List Table Latest News of Photonic Integrated Circuit Market Table Merger and Acquisition List Table Planned/Future Project of Photonic Integrated Circuit Market Table Policy of Photonic Integrated Circuit Market Table 2020-2030 Regional Export of Photonic Integrated Circuit Table 2020-2030 Regional Import of Photonic Integrated Circuit Table 2020-2030 Regional Trade Balance Figure 2020-2030 Regional Trade Balance Table 2020-2030 North America Photonic Integrated Circuit Market Size and Market Volume List Figure 2020-2030 North America Photonic Integrated Circuit Market Size and CAGR Figure 2020-2030 North America Photonic Integrated Circuit Market Volume and CAGR Table 2020-2030 North America Photonic Integrated Circuit Demand List by Application Table 2020-2025 North America Photonic Integrated Circuit Key Players Sales List Table 2020-2025 North America Photonic Integrated Circuit Key Players Market Share List Table 2020-2030 North America Photonic Integrated Circuit Demand List by Type



Table 2020-2025 North America Photonic Integrated Circuit Price List by Type Table 2020-2030 United States Photonic Integrated Circuit Market Size and Market Volume List

Table 2020-2030 United States Photonic Integrated Circuit Import & Export List Table 2020-2030 Canada Photonic Integrated Circuit Market Size and Market Volume List

Table 2020-2030 Canada Photonic Integrated Circuit Import & Export List Table 2020-2030 Mexico Photonic Integrated Circuit Market Size and Market Volume List

Table 2020-2030 Mexico Photonic Integrated Circuit Import & Export List

Table 2020-2030 South America Photonic Integrated Circuit Market Size and Market Volume List

Figure 2020-2030 South America Photonic Integrated Circuit Market Size and CAGR Figure 2020-2030 South America Photonic Integrated Circuit Market Volume and CAGR Table 2020-2030 South America Photonic Integrated Circuit Demand List by Application Table 2020-2025 South America Photonic Integrated Circuit Key Players Sales List Table 2020-2025 South America Photonic Integrated Circuit Key Players Market Share List

Table 2020-2030 South America Photonic Integrated Circuit Demand List by Type

Table 2020-2025 South America Photonic Integrated Circuit Price List by Type

Table 2020-2030 Brazil Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Brazil Photonic Integrated Circuit Import & Export List

Table 2020-2030 Argentina Photonic Integrated Circuit Market Size and Market Volume List

Table 2020-2030 Argentina Photonic Integrated Circuit Import & Export List

Table 2020-2030 Chile Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Chile Photonic Integrated Circuit Import & Export List

Table 2020-2030 Peru Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Peru Photonic Integrated Circuit Import & Export List

Table 2020-2030 Asia & Pacific Photonic Integrated Circuit Market Size and Market Volume List

Figure 2020-2030 Asia & Pacific Photonic Integrated Circuit Market Size and CAGR Figure 2020-2030 Asia & Pacific Photonic Integrated Circuit Market Volume and CAGR Table 2020-2030 Asia & Pacific Photonic Integrated Circuit Demand List by Application Table 2020-2025 Asia & Pacific Photonic Integrated Circuit Key Players Sales List Table 2020-2025 Asia & Pacific Photonic Integrated Circuit Key Players Market Share List

Table 2020-2030 Asia & Pacific Photonic Integrated Circuit Demand List by TypeTable 2020-2025 Asia & Pacific Photonic Integrated Circuit Price List by Type



Table 2020-2030 China Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 China Photonic Integrated Circuit Import & Export List Table 2020-2030 India Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 India Photonic Integrated Circuit Import & Export List Table 2020-2030 Japan Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Japan Photonic Integrated Circuit Import & Export List Table 2020-2030 South Korea Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 South Korea Photonic Integrated Circuit Import & Export List Table 2020-2030 Southeast Asia Photonic Integrated Circuit Market Size List Table 2020-2030 Southeast Asia Photonic Integrated Circuit Market Volume List Table 2020-2030 Southeast Asia Photonic Integrated Circuit Import List Table 2020-2030 Southeast Asia Photonic Integrated Circuit Export List Table 2020-2030 Australia Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Australia Photonic Integrated Circuit Import & Export List Table 2020-2030 Europe Photonic Integrated Circuit Market Size and Market Volume List Figure 2020-2030 Europe Photonic Integrated Circuit Market Size and CAGR Figure 2020-2030 Europe Photonic Integrated Circuit Market Volume and CAGR Table 2020-2030 Europe Photonic Integrated Circuit Demand List by Application Table 2020-2025 Europe Photonic Integrated Circuit Key Players Sales List Table 2020-2025 Europe Photonic Integrated Circuit Key Players Market Share List Table 2020-2030 Europe Photonic Integrated Circuit Demand List by Type Table 2020-2025 Europe Photonic Integrated Circuit Price List by Type Table 2020-2030 Germany Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Germany Photonic Integrated Circuit Import & Export List Table 2020-2030 France Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 France Photonic Integrated Circuit Import & Export List Table 2020-2030 United Kingdom Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 United Kingdom Photonic Integrated Circuit Import & Export List Table 2020-2030 Italy Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Italy Photonic Integrated Circuit Import & Export List Table 2020-2030 Spain Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Spain Photonic Integrated Circuit Import & Export List Table 2020-2030 Belgium Photonic Integrated Circuit Market Size and Market Volume



List

Table 2020-2030 Belgium Photonic Integrated Circuit Import & Export List Table 2020-2030 Netherlands Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Netherlands Photonic Integrated Circuit Import & Export List Table 2020-2030 Austria Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Austria Photonic Integrated Circuit Import & Export List Table 2020-2030 Poland Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Poland Photonic Integrated Circuit Import & Export List Table 2020-2030 Russia Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Russia Photonic Integrated Circuit Import & Export List Table 2020-2030 MEA Photonic Integrated Circuit Market Size and Market Volume List Figure 2020-2030 MEA Photonic Integrated Circuit Market Size and CAGR Figure 2020-2030 MEA Photonic Integrated Circuit Market Volume and CAGR Table 2020-2030 MEA Photonic Integrated Circuit Demand List by Application Table 2020-2025 MEA Photonic Integrated Circuit Key Players Sales List Table 2020-2025 MEA Photonic Integrated Circuit Key Players Market Share List Table 2020-2030 MEA Photonic Integrated Circuit Demand List by Type Table 2020-2025 MEA Photonic Integrated Circuit Price List by Type Table 2020-2030 Egypt Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Egypt Photonic Integrated Circuit Import & Export List Table 2020-2030 Israel Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Israel Photonic Integrated Circuit Import & Export List Table 2020-2030 South Africa Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 South Africa Photonic Integrated Circuit Import & Export List Table 2020-2030 Gulf Cooperation Council Countries Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Gulf Cooperation Council Countries Photonic Integrated Circuit Import & Export List Table 2020-2030 Turkey Photonic Integrated Circuit Market Size and Market Volume List Table 2020-2030 Turkey Photonic Integrated Circuit Import & Export List Table 2020-2025 Global Photonic Integrated Circuit Market Size List by Region Table 2020-2025 Global Photonic Integrated Circuit Market Size Share List by Region Table 2020-2025 Global Photonic Integrated Circuit Market Volume List by Region



Table 2020-2025 Global Photonic Integrated Circuit Market Volume Share List by Region

Table 2020-2025 Global Photonic Integrated Circuit Demand List by Application Table 2020-2025 Global Photonic Integrated Circuit Demand Market Share List by Application

Table 2020-2025 Global Photonic Integrated Circuit Key Vendors Sales List Table 2020-2025 Global Photonic Integrated Circuit Key Vendors Sales Share List Figure 2020-2025 Global Photonic Integrated Circuit Market Volume and Growth Rate Table 2020-2025 Global Photonic Integrated Circuit Key Vendors Revenue List Figure 2020-2025 Global Photonic Integrated Circuit Market Size and Growth Rate Table 2020-2025 Global Photonic Integrated Circuit Market Size and Growth Rate Table 2020-2025 Global Photonic Integrated Circuit Key Vendors Revenue Share List Table 2020-2025 Global Photonic Integrated Circuit Demand List by Type Table 2020-2025 Global Photonic Integrated Circuit Demand Market Share List by Type Table 2020-2025 Regional Photonic Integrated Circuit Price List Table 2025-2030 Global Photonic Integrated Circuit Market Size List by Region Table 2025-2030 Global Photonic Integrated Circuit Market Size Share List by Region Table 2025-2030 Global Photonic Integrated Circuit Market Size Share List by Region Table 2025-2030 Global Photonic Integrated Circuit Market Volume List by Region Table 2025-2030 Global Photonic Integrated Circuit Market Volume List by Region

Table 2025-2030 Global Photonic Integrated Circuit Demand List by Application Table 2025-2030 Global Photonic Integrated Circuit Demand Market Share List by Application

Table 2025-2030 Global Photonic Integrated Circuit Key Vendors Sales List Table 2025-2030 Global Photonic Integrated Circuit Key Vendors Sales Share List Figure 2025-2030 Global Photonic Integrated Circuit Market Volume and Growth Rate Table 2025-2030 Global Photonic Integrated Circuit Key Vendors Revenue List Figure 2025-2030 Global Photonic Integrated Circuit Market Size and Growth Rate Table 2025-2030 Global Photonic Integrated Circuit Key Vendors Revenue Share List Table 2025-2030 Global Photonic Integrated Circuit Key Vendors Revenue Share List Table 2025-2030 Global Photonic Integrated Circuit Demand List by Type Table 2025-2030 Global Photonic Integrated Circuit Demand Market Share List by Type Table 2025-2030 Photonic Integrated Circuit Regional Price List

Table Lumentum Operations Information

Table SWOT Analysis of Lumentum Operations

Table 2020-2025 Lumentum Operations Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 Lumentum Operations Photonic Integrated Circuit Sale Volume and Growth Rate

Figure 2020-2025 Lumentum Operations Photonic Integrated Circuit Market Share Table POET Technologies Information



Table SWOT Analysis of POET Technologies

Table 2020-2025 POET Technologies Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 POET Technologies Photonic Integrated Circuit Sale Volume and Growth Rate

Figure 2020-2025 POET Technologies Photonic Integrated Circuit Market Share

Table Coherent Information

Table SWOT Analysis of Coherent

Table 2020-2025 Coherent Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 Coherent Photonic Integrated Circuit Sale Volume and Growth Rate Figure 2020-2025 Coherent Photonic Integrated Circuit Market Share

Table Infinera Corporation Information

Table SWOT Analysis of Infinera Corporation

Table 2020-2025 Infinera Corporation Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 Infinera Corporation Photonic Integrated Circuit Sale Volume and Growth Rate

Figure 2020-2025 Infinera Corporation Photonic Integrated Circuit Market Share Table Intel Corporation Information

Table SWOT Analysis of Intel Corporation

Table 2020-2025 Intel Corporation Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 Intel Corporation Photonic Integrated Circuit Sale Volume and Growth Rate

Figure 2020-2025 Intel Corporation Photonic Integrated Circuit Market Share

Table Cisco Systems Information

Table SWOT Analysis of Cisco Systems

Table 2020-2025 Cisco Systems Photonic Integrated Circuit Sale Volume Price Cost Revenue

Figure 2020-2025 Cisco Systems Photonic Integrated Circuit Sale Volume and Growth Rate

Figure 2020-2025 Cisco Systems Photonic Integrated Circuit Market Share

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