

# Global On-chip Photonic Quantum Processing Unit Market Growth (Status and Outlook) 2026-2032

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## Abstracts

The global On-chip Photonic Quantum Processing Unit market size is predicted to grow from US\$ 709 million in 2025 to US\$ 2620 million in 2032; it is expected to grow at a CAGR of 20.7% from 2026 to 2032.

An on-chip photonic quantum processing unit (PCU) is a core computing unit that integrates key quantum functions such as single-photon generation, quantum state manipulation, interference operations, and measurement readout onto a single photonic chip. Essentially, it achieves controllable interference and entanglement evolution of multi-photon quantum states within the chip through ultra-low-loss waveguides, programmable phase modulators, and highly consistent beam-splitting networks. Based on the long coherence time and room-temperature operability of photons, this core emphasizes large-scale scalability and semiconductor process compatibility, serving as a crucial technological hub for optical quantum computing to move from experimental optical platforms to engineering, large-scale deployment, and industrialization.

This report presents a comprehensive overview, market shares, and growth opportunities of On-chip Photonic Quantum Processing Unit market by product type, application, key players and key regions and countries.

Segmentation by Type:

Continuous-Variable Photonic Quantum Computing

Discrete-Variable / Single-Photon Quantum Computing

Segmentation by Position In the Value Chain:

Photonic Quantum Computer System Providers

Photonic Quantum Chip / Processor Developers

Segmentation by Application Focus:

Universal Quantum Computing

Quantum Communication & Security

Research & Industrial Prototyping

Segmentation by Application:

Photonic Quantum Computing

Photonic Quantum Simulation

Quantum Cloud Platform

This report also splits the market by region:

United States

China

Europe

Other regions

Japan

South Korea

Southeast Asia

Rest of world

The report also presents the market competition landscape and a corresponding detailed analysis of the major players in the market. The key players covered in this report:

Xanadu

PsiQuantum

TuringQ Co.,Ltd.

Hefei Guizhen Chip Technology Co., Ltd.

Beijing QBoson Quantum Technology Co.,Ltd.

QuiX Quantum

Quandela

Photonic

CHIPX

## Contents

### 1 SCOPE OF THE REPORT

- 1.1 Market Introduction
- 1.2 Years Considered
- 1.3 Research Objectives
- 1.4 Market Research Methodology
- 1.5 Research Process and Data Source
- 1.6 Economic Indicators
- 1.7 Currency Considered

### 2 EXECUTIVE SUMMARY

- 2.1 World Market Overview
  - 2.1.1 Global On-chip Photonic Quantum Processing Unit Market Size 2026-2032
  - 2.1.2 On-chip Photonic Quantum Processing Unit Market Size CAGR by Region
- 2.2 On-chip Photonic Quantum Processing Unit Segment by Type
  - 2.2.1 Continuous-Variable Photonic Quantum Computing
  - 2.2.2 Discrete-Variable / Single-Photon Quantum Computing
  - 2.2.3 On-chip Photonic Quantum Processing Unit Market Size by Type
    - 2.2.3.1 Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
    - 2.2.3.2 Global On-chip Photonic Quantum Processing Unit Market Size Growth Rate by Type (2026-2032)
- 2.3 On-chip Photonic Quantum Processing Unit Segment by Position In the Value Chain
  - 2.3.1 Photonic Quantum Computer System Providers
  - 2.3.2 Photonic Quantum Chip / Processor Developers
  - 2.3.3 On-chip Photonic Quantum Processing Unit Market Size by Position In the Value Chain
    - 2.3.3.1 Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Position In the Value Chain (2026-2032)
    - 2.3.3.2 Global On-chip Photonic Quantum Processing Unit Market Size Growth Rate by Position In the Value Chain (2026-2032)
- 2.4 On-chip Photonic Quantum Processing Unit Segment by Application Focus
  - 2.4.1 Universal Quantum Computing
  - 2.4.2 Quantum Communication & Security
  - 2.4.3 Research & Industrial Prototyping
  - 2.4.4 On-chip Photonic Quantum Processing Unit Market Size by Application Focus

2.4.4.1 Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Application Focus (2026-2032)

2.4.4.2 Global On-chip Photonic Quantum Processing Unit Market Size Growth Rate by Application Focus (2026-2032)

2.5 On-chip Photonic Quantum Processing Unit Segment by Application

2.5.1 Photonic Quantum Computing

2.5.2 Photonic Quantum Simulation

2.5.3 Quantum Cloud Platform

2.5.4 On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032)

2.5.4.1 Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Application (2026-2032)

2.5.4.2 Global On-chip Photonic Quantum Processing Unit Market Size Growth Rate by Application (2026-2032)

### **3 ON-CHIP PHOTONIC QUANTUM PROCESSING UNIT KEY PLAYERS**

3.1 Date of Key Players Enter into On-chip Photonic Quantum Processing Unit

3.2 Key Players On-chip Photonic Quantum Processing Unit Product Offered

3.3 Key Players On-chip Photonic Quantum Processing Unit Funding/Investment Analysis

3.4 Funding/Investment

3.4.1 Funding/Investment by Regions

3.4.2 Funding/Investment by End-Industry

3.5 Key Players On-chip Photonic Quantum Processing Unit Valuation & Market Capitalization

3.6 Key Players Mergers & Acquisitions, Expansion Plans

3.7 Market Ranking

3.8 New Product/Technology Launches

3.9 Partnerships, Agreements, and Collaborations

3.10 Mergers and Acquisitions

### **4 ON-CHIP PHOTONIC QUANTUM PROCESSING UNIT BY REGIONS**

4.1 On-chip Photonic Quantum Processing Unit Market Size by Regions (2026-2032)

4.2 United States On-chip Photonic Quantum Processing Unit Market Size Growth (2026-2032)

4.3 China On-chip Photonic Quantum Processing Unit Market Size Growth (2026-2032)

4.4 Europe On-chip Photonic Quantum Processing Unit Market Size Growth

(2026-2032)

4.5 Rest of World On-chip Photonic Quantum Processing Unit Market Size Growth  
(2026-2032)

## **5 UNITED STATES**

5.1 United States On-chip Photonic Quantum Processing Unit Market Size by Type  
(2026-2032)

5.2 United States On-chip Photonic Quantum Processing Unit Market Size by  
Application (2026-2032)

## **6 EUROPE**

6.1 Europe On-chip Photonic Quantum Processing Unit Market Size by Type  
(2026-2032)

6.2 Europe On-chip Photonic Quantum Processing Unit Market Size by Application  
(2026-2032)

## **7 CHINA**

7.1 China On-chip Photonic Quantum Processing Unit Market Size by Type  
(2026-2032)

7.2 China On-chip Photonic Quantum Processing Unit Market Size by Application  
(2026-2032)

## **8 REST OF WORLD**

8.1 Rest of World On-chip Photonic Quantum Processing Unit Market Size by Type  
(2026-2032)

8.2 Rest of World On-chip Photonic Quantum Processing Unit Market Size by  
Application (2026-2032)

8.3 Japan

8.4 South Korea

8.5 Southeast Asia

## **9 MARKET DRIVERS, CHALLENGES AND TRENDS**

9.1 Market Drivers & Growth Opportunities

9.2 Market Challenges & Risks

## 9.3 Industry Trends

# 10 KEY INVESTORS IN ON-CHIP PHOTONIC QUANTUM PROCESSING UNIT

## 10.1 Company A

10.1.1 Company A Company Details

10.1.2 Company Description

10.1.3 Companies Invested by Company A

10.1.4 Company A Key Development and Market Layout

## 10.2 Company B

10.2.1 Company B Company Details

10.2.2 Company Description

10.2.3 Companies Invested by Company B

10.2.4 Company B Key Development and Market Layout

## 10.3 Company C

10.3.1 Company C Company Details

10.3.2 Company Description

10.3.3 Companies Invested by Company C

10.3.4 Company C Key Development and Market Layout

## 10.4 Company D

## 10.5 .....

# 11 KEY PLAYERS ANALYSIS

## 11.1 Xanadu

11.1.1 Xanadu Company Details

11.1.2 Xanadu On-chip Photonic Quantum Processing Unit Product Offered

11.1.3 Xanadu On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

11.1.4 Xanadu Main Business Overview

11.1.5 Xanadu News

## 11.2 PsiQuantum

11.2.1 PsiQuantum Company Details

11.2.2 PsiQuantum On-chip Photonic Quantum Processing Unit Product Offered

11.2.3 PsiQuantum On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

11.2.4 PsiQuantum Main Business Overview

11.2.5 PsiQuantum News

## 11.3 TuringQ Co.,Ltd.

- 11.3.1 TuringQ Co.,Ltd. Company Details
- 11.3.2 TuringQ Co.,Ltd. On-chip Photonic Quantum Processing Unit Product Offered
- 11.3.3 TuringQ Co.,Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)
- 11.3.4 TuringQ Co.,Ltd. Main Business Overview
- 11.3.5 TuringQ Co.,Ltd. News
- 11.4 Hefei Guizhen Chip Technology Co., Ltd.
- 11.4.1 Hefei Guizhen Chip Technology Co., Ltd. Company Details
- 11.4.2 Hefei Guizhen Chip Technology Co., Ltd. On-chip Photonic Quantum Processing Unit Product Offered
- 11.4.3 Hefei Guizhen Chip Technology Co., Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)
- 11.4.4 Hefei Guizhen Chip Technology Co., Ltd. Main Business Overview
- 11.4.5 Hefei Guizhen Chip Technology Co., Ltd. News
- 11.5 Beijing QBoson Quantum Technology Co.,Ltd.
- 11.5.1 Beijing QBoson Quantum Technology Co.,Ltd. Company Details
- 11.5.2 Beijing QBoson Quantum Technology Co.,Ltd. On-chip Photonic Quantum Processing Unit Product Offered
- 11.5.3 Beijing QBoson Quantum Technology Co.,Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)
- 11.5.4 Beijing QBoson Quantum Technology Co.,Ltd. Main Business Overview
- 11.5.5 Beijing QBoson Quantum Technology Co.,Ltd. News
- 11.6 QuiX Quantum
- 11.6.1 QuiX Quantum Company Details
- 11.6.2 QuiX Quantum On-chip Photonic Quantum Processing Unit Product Offered
- 11.6.3 QuiX Quantum On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)
- 11.6.4 QuiX Quantum Main Business Overview
- 11.6.5 QuiX Quantum News
- 11.7 Quandela
- 11.7.1 Quandela Company Details
- 11.7.2 Quandela On-chip Photonic Quantum Processing Unit Product Offered
- 11.7.3 Quandela On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)
- 11.7.4 Quandela Main Business Overview
- 11.7.5 Quandela News
- 11.8 Photonic
- 11.8.1 Photonic Company Details
- 11.8.2 Photonic On-chip Photonic Quantum Processing Unit Product Offered

11.8.3 Photonic On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

11.8.4 Photonic Main Business Overview

11.8.5 Photonic News

11.9 CHIPX

11.9.1 CHIPX Company Details

11.9.2 CHIPX On-chip Photonic Quantum Processing Unit Product Offered

11.9.3 CHIPX On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

11.9.4 CHIPX Main Business Overview

11.9.5 CHIPX News

## **12 RESEARCH FINDINGS AND CONCLUSION**

## List Of Tables

### LIST OF TABLES

Table 1. On-chip Photonic Quantum Processing Unit Market Size CAGR by Region (2026-2032) (\$ millions)

Table 2. Major Players of Continuous-Variable Photonic Quantum Computing

Table 3. Major Players of Discrete-Variable / Single-Photon Quantum Computing

Table 4. Global Market Size by Type (2026-2032) (\$ millions)

Table 5. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)

Table 6. Major Players of Photonic Quantum Computer System Providers

Table 7. Major Players of Photonic Quantum Chip / Processor Developers

Table 8. Global Market Size by Position In the Value Chain (2026-2032) (\$ millions)

Table 9. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Position In the Value Chain (2026-2032)

Table 10. Major Players of Universal Quantum Computing

Table 11. Major Players of Quantum Communication & Security

Table 12. Major Players of Research & Industrial Prototyping

Table 13. Global Market Size by Application Focus (2026-2032) (\$ millions)

Table 14. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Application Focus (2026-2032)

Table 15. Global On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032) (\$ millions)

Table 16. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Application (2026-2032)

Table 17. Date of Global Key Players Enter into On-chip Photonic Quantum Processing Unit Market

Table 18. Global Key Players On-chip Photonic Quantum Processing Unit Product Offered

Table 19. Key Players On-chip Photonic Quantum Processing Unit Funding/Investment (Million USD)

Table 20. Funding/Investment by Regions

Table 21. Funding/Investment by End-Industry

Table 22. Key Players On-chip Photonic Quantum Processing Unit Valuation & Market Capitalization (Million USD)

Table 23. Key Players Mergers & Acquisitions, Expansion Plans

Table 24. On-chip Photonic Quantum Processing Unit New Product/Technology Launches

- Table 25. On-chip Photonic Quantum Processing Unit Industry Partnerships, Agreements, and Collaborations
- Table 26. On-chip Photonic Quantum Processing Unit Industry Mergers and Acquisitions
- Table 27. Global On-chip Photonic Quantum Processing Unit Market Size by Regions 2026-2032 (\$ millions)
- Table 28. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Regions 2026-2032
- Table 29. United States On-chip Photonic Quantum Processing Unit Market Size by Type (2026-2032) (\$ millions)
- Table 30. United States On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
- Table 31. United States On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032) (\$ millions)
- Table 32. United States On-chip Photonic Quantum Processing Unit Market Size Market Share by Application (2026-2032)
- Table 33. Europe On-chip Photonic Quantum Processing Unit Market Size by Type (2026-2032) (\$ millions)
- Table 34. Europe On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
- Table 35. Europe On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032) (\$ millions)
- Table 36. Europe On-chip Photonic Quantum Processing Unit Market Size Market Share by Application (2026-2032)
- Table 37. China On-chip Photonic Quantum Processing Unit Market Size by Type (2026-2032) (\$ millions)
- Table 38. China On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
- Table 39. China On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032) (\$ millions)
- Table 40. China On-chip Photonic Quantum Processing Unit Market Size Market Share by Application (2026-2032)
- Table 41. Rest of World On-chip Photonic Quantum Processing Unit Market Size by Type (2026-2032) (\$ millions)
- Table 42. Rest of World On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
- Table 43. Rest of World On-chip Photonic Quantum Processing Unit Market Size by Application (2026-2032) (\$ millions)
- Table 44. Rest of World On-chip Photonic Quantum Processing Unit Market Size

## Market Share by Application (2026-2032)

Table 45. Key Market Drivers & Growth Opportunities of On-chip Photonic Quantum Processing Unit

Table 46. Key Market Challenges & Risks of On-chip Photonic Quantum Processing Unit

Table 47. Key Industry Trends of On-chip Photonic Quantum Processing Unit

Table 48. Company A Company Details

Table 49. Companies Invested by Company A

Table 50. Company A Key Development and Market Layout

Table 51. Company B Company Details

Table 52. Companies Invested by Company B

Table 53. Company B Key Development and Market Layout

Table 54. Company C Company Details

Table 55. Companies Invested by Company C

Table 56. Company C Key Development and Market Layout

Table 57. Xanadu Basic Information, Head Office, Major Market Areas and Its Competitors

Table 58. Xanadu On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 59. PsiQuantum Basic Information, Head Office, Major Market Areas and Its Competitors

Table 60. PsiQuantum On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 61. TuringQ Co.,Ltd. Basic Information, Head Office, Major Market Areas and Its Competitors

Table 62. TuringQ Co.,Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 63. Hefei Guizhen Chip Technology Co., Ltd. Basic Information, Head Office, Major Market Areas and Its Competitors

Table 64. Hefei Guizhen Chip Technology Co., Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 65. Beijing QBoson Quantum Technology Co.,Ltd. Basic Information, Head Office, Major Market Areas and Its Competitors

Table 66. Beijing QBoson Quantum Technology Co.,Ltd. On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 67. QuiX Quantum Basic Information, Head Office, Major Market Areas and Its Competitors

Table 68. QuiX Quantum On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 69. Quandela Basic Information, Head Office, Major Market Areas and Its Competitors

Table 70. Quandela On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 71. Photonic Basic Information, Head Office, Major Market Areas and Its Competitors

Table 72. Photonic On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

Table 73. CHIPX Basic Information, Head Office, Major Market Areas and Its Competitors

Table 74. CHIPX On-chip Photonic Quantum Processing Unit Market Size (2025 VS 2031)

## List Of Figures

### LIST OF FIGURES

- Figure 1. Picture of On-chip Photonic Quantum Processing Unit
- Figure 2. On-chip Photonic Quantum Processing Unit Report Years Considered
- Figure 3. Research Objectives
- Figure 4. Research Methodology
- Figure 5. Research Process and Data Source
- Figure 6. Global On-chip Photonic Quantum Processing Unit Market Size Growth Rate 2026-2032 (\$ millions)
- Figure 7. On-chip Photonic Quantum Processing Unit Market Size by Region (2025 & 2032) (\$ millions)
- Figure 8. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Type (2026-2032)
- Figure 9. Global Continuous-Variable Photonic Quantum Computing Market Size Growth Rate
- Figure 10. Global Discrete-Variable / Single-Photon Quantum Computing Market Size Growth Rate
- Figure 11. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Position In the Value Chain (2026-2032)
- Figure 12. Global Photonic Quantum Computer System Providers Market Size Growth Rate
- Figure 13. Global Photonic Quantum Chip / Processor Developers Market Size Growth Rate
- Figure 14. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Application Focus (2026-2032)
- Figure 15. Global Universal Quantum Computing Market Size Growth Rate
- Figure 16. Global Quantum Communication & Security Market Size Growth Rate
- Figure 17. On-chip Photonic Quantum Processing Unit in Photonic Quantum Computing
- Figure 18. Global On-chip Photonic Quantum Processing Unit Market: Photonic Quantum Computing (2026-2032) (\$ millions)
- Figure 19. On-chip Photonic Quantum Processing Unit in Photonic Quantum Simulation
- Figure 20. Global On-chip Photonic Quantum Processing Unit Market: Photonic Quantum Simulation (2026-2032) (\$ millions)
- Figure 21. On-chip Photonic Quantum Processing Unit in Quantum Cloud Platform
- Figure 22. Global On-chip Photonic Quantum Processing Unit Market: Quantum Cloud Platform (2026-2032) (\$ millions)
- Figure 23. Global On-chip Photonic Quantum Processing Unit Market Size Market

Share by Application (2026-2032)

Figure 24. Global On-chip Photonic Quantum Processing Unit Market Size in Photonic Quantum Computing Growth Rate

Figure 25. Global On-chip Photonic Quantum Processing Unit Market Size in Photonic Quantum Simulation Growth Rate

Figure 26. Funding/Investment

Figure 27. Global On-chip Photonic Quantum Processing Unit Market Size Market Share by Regions 2026-2032

Figure 28. United States On-chip Photonic Quantum Processing Unit Market Size 2026-2032 (\$ millions)

Figure 29. China On-chip Photonic Quantum Processing Unit Market Size 2026-2032 (\$ millions)

Figure 30. Europe On-chip Photonic Quantum Processing Unit Market Size 2026-2032 (\$ millions)

Figure 31. Rest of World On-chip Photonic Quantum Processing Unit Market Size 2026-2032 (\$ millions)

Figure 32. United States On-chip Photonic Quantum Processing Unit Consumption Market Share by Type in 2030

Figure 33. United States On-chip Photonic Quantum Processing Unit Market Size Market Share by Application in 2030

Figure 34. Europe On-chip Photonic Quantum Processing Unit Consumption Market Share by Type in 2030

Figure 35. Europe On-chip Photonic Quantum Processing Unit Market Size Market Share by Application in 2030

Figure 36. China On-chip Photonic Quantum Processing Unit Consumption Market Share by Type in 2030

Figure 37. China On-chip Photonic Quantum Processing Unit Market Size Market Share by Application in 2030

Figure 38. Rest of World On-chip Photonic Quantum Processing Unit Consumption Market Share by Type in 2030

Figure 39. Rest of World On-chip Photonic Quantum Processing Unit Market Size Market Share by Application in 2030

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