

Global Quantum Dot Infrared Photodetectors Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Quantum Dot Infrared Photodetectors market size is expected to reach \$ 798 million by 2032, rising at a market growth of 14.0% CAGR during the forecast period (2026-2032).

In 2025, global Quantum Dot Infrared Photodetectors output reached about 5 million units and global capacity of around 8 million units. The average unit price is about USD 62, with gross margins near 39%. Quantum Dot Infrared Photodetectors (QDIPs) are semiconductor photodetectors that utilize quantum dots—nanoscale semiconductor crystals with discrete energy levels—to absorb infrared (IR) radiation and convert it into electrical signals. These devices operate in the short-wave (SWIR), mid-wave (MWIR), and long-wave infrared (LWIR) spectral ranges and are widely used in thermal imaging, night vision, environmental sensing, medical diagnostics, industrial monitoring, and defense surveillance systems. Their key advantages include high sensitivity, tunable spectral response, low dark current, and compatibility with standard semiconductor fabrication processes. The supply chain begins with upstream raw materials and nanomaterial synthesis, including semiconductor compounds such as lead sulfide (PbS), lead selenide (PbSe), mercury telluride (HgTe), indium arsenide (InAs), cadmium selenide (CdSe), and other III–V or II–VI materials, along with precursors, solvents, and ligands used in colloidal quantum dot synthesis. The midstream stage involves quantum dot fabrication, thin-film deposition, and device integration, including epitaxial growth or colloidal synthesis, photolithography, wafer processing, and integration with CMOS readout integrated circuits (ROICs) and focal plane arrays. The downstream segment includes infrared imaging modules, thermal cameras, spectroscopy instruments, autonomous vehicle sensors, aerospace systems, security monitoring devices, and industrial inspection equipment, where QDIPs are incorporated into advanced sensing and imaging platforms.

This report studies the global Quantum Dot Infrared Photodetectors production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Quantum Dot Infrared Photodetectors and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Quantum Dot Infrared Photodetectors that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Quantum Dot Infrared Photodetectors total production and demand, 2021-2032, (K Units)

Global Quantum Dot Infrared Photodetectors total production value, 2021-2032, (USD Million)

Global Quantum Dot Infrared Photodetectors production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Quantum Dot Infrared Photodetectors consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Quantum Dot Infrared Photodetectors domestic production, consumption, key domestic manufacturers and share

Global Quantum Dot Infrared Photodetectors production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)

Global Quantum Dot Infrared Photodetectors production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

Global Quantum Dot Infrared Photodetectors production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

This report profiles key players in the global Quantum Dot Infrared Photodetectors market based on the following parameters - company overview, production, value, price,

gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include SWIR Vision Systems, Emberion, QDI Systems, Aeluma, Hamamatsu Photonics, Teledyne Technologies, Leonardo DRS, SemiConductor Devices, Excelitas Technologies, Allied Vision Technologies, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Quantum Dot Infrared Photodetectors market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (K Units) and average price (US\$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Quantum Dot Infrared Photodetectors Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Quantum Dot Infrared Photodetectors Market, Segmentation by Type:

Short-Wave Infrared (SWIR) QDIPs

Mid-Wave Infrared (MWIR) QDIPs

Long-Wave Infrared (LWIR) QDIPs

Broadband Infrared QDIPs

Global Quantum Dot Infrared Photodetectors Market, Segmentation by Quantum Dot Material:

Lead Sulfide (PbS)

Lead Selenide (PbSe)

Mercury Telluride (HgTe)

Cadmium Selenide (CdSe)

Indium Arsenide (InAs)

Gallium Arsenide (GaAs)

Global Quantum Dot Infrared Photodetectors Market, Segmentation by Application:

Aerospace & Defense

Security & Surveillance

Automotive

Industrial

Environmental

Agricultural

Medical

Others

Companies Profiled:

SWIR Vision Systems

Emberion

QDI Systems

Aeluma

Hamamatsu Photonics

Teledyne Technologies

Leonardo DRS

SemiConductor Devices

Excelitas Technologies

Allied Vision Technologies

New Imaging Technologies

Princeton Infrared Technologies

Himax Technologies

OmniVision Technologies

Key Questions Answered:

1. How big is the global Quantum Dot Infrared Photodetectors market?
2. What is the demand of the global Quantum Dot Infrared Photodetectors market?

3. What is the year over year growth of the global Quantum Dot Infrared Photodetectors market?
4. What is the production and production value of the global Quantum Dot Infrared Photodetectors market?
5. Who are the key producers in the global Quantum Dot Infrared Photodetectors market?
6. What are the growth factors driving the market demand?

Contents

1 SUPPLY SUMMARY

- 1.1 Quantum Dot Infrared Photodetectors Introduction
- 1.2 World Quantum Dot Infrared Photodetectors Supply & Forecast
 - 1.2.1 World Quantum Dot Infrared Photodetectors Production Value (2021 & 2025 & 2032)
 - 1.2.2 World Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.2.3 World Quantum Dot Infrared Photodetectors Pricing Trends (2021-2032)
- 1.3 World Quantum Dot Infrared Photodetectors Production by Region (Based on Production Site)
 - 1.3.1 World Quantum Dot Infrared Photodetectors Production Value by Region (2021-2032)
 - 1.3.2 World Quantum Dot Infrared Photodetectors Production by Region (2021-2032)
 - 1.3.3 World Quantum Dot Infrared Photodetectors Average Price by Region (2021-2032)
 - 1.3.4 North America Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.5 Europe Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.6 China Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.7 Japan Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.8 South Korea Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.9 Southeast Asia Quantum Dot Infrared Photodetectors Production (2021-2032)
 - 1.3.10 China Taiwan Quantum Dot Infrared Photodetectors Production (2021-2032)
- 1.4 Market Drivers, Restraints and Trends
 - 1.4.1 Quantum Dot Infrared Photodetectors Market Drivers
 - 1.4.2 Factors Affecting Demand
 - 1.4.3 Quantum Dot Infrared Photodetectors Major Market Trends

2 DEMAND SUMMARY

- 2.1 World Quantum Dot Infrared Photodetectors Demand (2021-2032)
- 2.2 World Quantum Dot Infrared Photodetectors Consumption by Region
 - 2.2.1 World Quantum Dot Infrared Photodetectors Consumption by Region (2021-2026)
 - 2.2.2 World Quantum Dot Infrared Photodetectors Consumption Forecast by Region (2027-2032)
- 2.3 United States Quantum Dot Infrared Photodetectors Consumption (2021-2032)
- 2.4 China Quantum Dot Infrared Photodetectors Consumption (2021-2032)

- 2.5 Europe Quantum Dot Infrared Photodetectors Consumption (2021-2032)
- 2.6 Japan Quantum Dot Infrared Photodetectors Consumption (2021-2032)
- 2.7 South Korea Quantum Dot Infrared Photodetectors Consumption (2021-2032)
- 2.8 ASEAN Quantum Dot Infrared Photodetectors Consumption (2021-2032)
- 2.9 India Quantum Dot Infrared Photodetectors Consumption (2021-2032)

3 WORLD MANUFACTURERS COMPETITIVE ANALYSIS

- 3.1 World Quantum Dot Infrared Photodetectors Production Value by Manufacturer (2021-2026)
- 3.2 World Quantum Dot Infrared Photodetectors Production by Manufacturer (2021-2026)
- 3.3 World Quantum Dot Infrared Photodetectors Average Price by Manufacturer (2021-2026)
- 3.4 Quantum Dot Infrared Photodetectors Company Evaluation Quadrant
- 3.5 Industry Rank and Concentration Rate (CR)
 - 3.5.1 Global Quantum Dot Infrared Photodetectors Industry Rank of Major Manufacturers
 - 3.5.2 Global Concentration Ratios (CR4) for Quantum Dot Infrared Photodetectors in 2025
 - 3.5.3 Global Concentration Ratios (CR8) for Quantum Dot Infrared Photodetectors in 2025
- 3.6 Quantum Dot Infrared Photodetectors Market: Overall Company Footprint Analysis
 - 3.6.1 Quantum Dot Infrared Photodetectors Market: Region Footprint
 - 3.6.2 Quantum Dot Infrared Photodetectors Market: Company Product Type Footprint
 - 3.6.3 Quantum Dot Infrared Photodetectors Market: Company Product Application Footprint
- 3.7 Competitive Environment
 - 3.7.1 Historical Structure of the Industry
 - 3.7.2 Barriers of Market Entry
 - 3.7.3 Factors of Competition
- 3.8 New Entrant and Capacity Expansion Plans
- 3.9 Mergers, Acquisition, Agreements, and Collaborations

4 UNITED STATES VS CHINA VS REST OF THE WORLD

- 4.1 United States VS China: Quantum Dot Infrared Photodetectors Production Value Comparison
 - 4.1.1 United States VS China: Quantum Dot Infrared Photodetectors Production Value

Comparison (2021 & 2025 & 2032)

4.1.2 United States VS China: Quantum Dot Infrared Photodetectors Production Value Market Share Comparison (2021 & 2025 & 2032)

4.2 United States VS China: Quantum Dot Infrared Photodetectors Production Comparison

4.2.1 United States VS China: Quantum Dot Infrared Photodetectors Production Comparison (2021 & 2025 & 2032)

4.2.2 United States VS China: Quantum Dot Infrared Photodetectors Production Market Share Comparison (2021 & 2025 & 2032)

4.3 United States VS China: Quantum Dot Infrared Photodetectors Consumption Comparison

4.3.1 United States VS China: Quantum Dot Infrared Photodetectors Consumption Comparison (2021 & 2025 & 2032)

4.3.2 United States VS China: Quantum Dot Infrared Photodetectors Consumption Market Share Comparison (2021 & 2025 & 2032)

4.4 United States Based Quantum Dot Infrared Photodetectors Manufacturers and Market Share, 2021-2026

4.4.1 United States Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (States, Country)

4.4.2 United States Based Manufacturers Quantum Dot Infrared Photodetectors Production Value (2021-2026)

4.4.3 United States Based Manufacturers Quantum Dot Infrared Photodetectors Production (2021-2026)

4.5 China Based Quantum Dot Infrared Photodetectors Manufacturers and Market Share

4.5.1 China Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (Province, Country)

4.5.2 China Based Manufacturers Quantum Dot Infrared Photodetectors Production Value (2021-2026)

4.5.3 China Based Manufacturers Quantum Dot Infrared Photodetectors Production (2021-2026)

4.6 Rest of World Based Quantum Dot Infrared Photodetectors Manufacturers and Market Share, 2021-2026

4.6.1 Rest of World Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (State, Country)

4.6.2 Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production Value (2021-2026)

4.6.3 Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production (2021-2026)

5 MARKET ANALYSIS BY TYPE

5.1 World Quantum Dot Infrared Photodetectors Market Size Overview by Type: 2021 VS 2025 VS 2032

5.2 Segment Introduction by Type

5.2.1 Short-Wave Infrared (SWIR) QDIPs

5.2.2 Mid-Wave Infrared (MWIR) QDIPs

5.2.3 Long-Wave Infrared (LWIR) QDIPs

5.2.4 Broadband Infrared QDIPs

5.3 Market Segment by Type

5.3.1 World Quantum Dot Infrared Photodetectors Production by Type (2021-2032)

5.3.2 World Quantum Dot Infrared Photodetectors Production Value by Type (2021-2032)

5.3.3 World Quantum Dot Infrared Photodetectors Average Price by Type (2021-2032)

6 MARKET ANALYSIS BY QUANTUM DOT MATERIAL

6.1 World Quantum Dot Infrared Photodetectors Market Size Overview by Quantum Dot Material: 2021 VS 2025 VS 2032

6.2 Segment Introduction by Quantum Dot Material

6.2.1 Lead Sulfide (PbS)

6.2.2 Lead Selenide (PbSe)

6.2.3 Mercury Telluride (HgTe)

6.2.4 Cadmium Selenide (CdSe)

6.2.5 Indium Arsenide (InAs)

6.2.6 Gallium Arsenide (GaAs)

6.3 Market Segment by Quantum Dot Material

6.3.1 World Quantum Dot Infrared Photodetectors Production by Quantum Dot Material (2021-2032)

6.3.2 World Quantum Dot Infrared Photodetectors Production Value by Quantum Dot Material (2021-2032)

6.3.3 World Quantum Dot Infrared Photodetectors Average Price by Quantum Dot Material (2021-2032)

7 MARKET ANALYSIS BY APPLICATION

7.1 World Quantum Dot Infrared Photodetectors Market Size Overview by Application: 2021 VS 2025 VS 2032

7.2 Segment Introduction by Application

- 7.2.1 Aerospace & Defense
- 7.2.2 Security & Surveillance
- 7.2.3 Automotive
- 7.2.4 Industrial
- 7.2.5 Environmental
- 7.2.6 Agricultural
- 7.2.7 Medical
- 7.2.8 Others

7.3 Market Segment by Application

- 7.3.1 World Quantum Dot Infrared Photodetectors Production by Application (2021-2032)
- 7.3.2 World Quantum Dot Infrared Photodetectors Production Value by Application (2021-2032)
- 7.3.3 World Quantum Dot Infrared Photodetectors Average Price by Application (2021-2032)

8 COMPANY PROFILES

8.1 SWIR Vision Systems

- 8.1.1 SWIR Vision Systems Details
- 8.1.2 SWIR Vision Systems Major Business
- 8.1.3 SWIR Vision Systems Quantum Dot Infrared Photodetectors Product and Services
- 8.1.4 SWIR Vision Systems Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
- 8.1.5 SWIR Vision Systems Recent Developments/Updates
- 8.1.6 SWIR Vision Systems Competitive Strengths & Weaknesses

8.2 Emberion

- 8.2.1 Emberion Details
- 8.2.2 Emberion Major Business
- 8.2.3 Emberion Quantum Dot Infrared Photodetectors Product and Services
- 8.2.4 Emberion Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
- 8.2.5 Emberion Recent Developments/Updates
- 8.2.6 Emberion Competitive Strengths & Weaknesses

8.3 QDI Systems

- 8.3.1 QDI Systems Details
- 8.3.2 QDI Systems Major Business

- 8.3.3 QDI Systems Quantum Dot Infrared Photodetectors Product and Services
- 8.3.4 QDI Systems Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
- 8.3.5 QDI Systems Recent Developments/Updates
- 8.3.6 QDI Systems Competitive Strengths & Weaknesses
- 8.4 Aeluma
 - 8.4.1 Aeluma Details
 - 8.4.2 Aeluma Major Business
 - 8.4.3 Aeluma Quantum Dot Infrared Photodetectors Product and Services
 - 8.4.4 Aeluma Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
 - 8.4.5 Aeluma Recent Developments/Updates
 - 8.4.6 Aeluma Competitive Strengths & Weaknesses
- 8.5 Hamamatsu Photonics
 - 8.5.1 Hamamatsu Photonics Details
 - 8.5.2 Hamamatsu Photonics Major Business
 - 8.5.3 Hamamatsu Photonics Quantum Dot Infrared Photodetectors Product and Services
 - 8.5.4 Hamamatsu Photonics Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
 - 8.5.5 Hamamatsu Photonics Recent Developments/Updates
 - 8.5.6 Hamamatsu Photonics Competitive Strengths & Weaknesses
- 8.6 Teledyne Technologies
 - 8.6.1 Teledyne Technologies Details
 - 8.6.2 Teledyne Technologies Major Business
 - 8.6.3 Teledyne Technologies Quantum Dot Infrared Photodetectors Product and Services
 - 8.6.4 Teledyne Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
 - 8.6.5 Teledyne Technologies Recent Developments/Updates
 - 8.6.6 Teledyne Technologies Competitive Strengths & Weaknesses
- 8.7 Leonardo DRS
 - 8.7.1 Leonardo DRS Details
 - 8.7.2 Leonardo DRS Major Business
 - 8.7.3 Leonardo DRS Quantum Dot Infrared Photodetectors Product and Services
 - 8.7.4 Leonardo DRS Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)
 - 8.7.5 Leonardo DRS Recent Developments/Updates
 - 8.7.6 Leonardo DRS Competitive Strengths & Weaknesses

8.8 SemiConductor Devices

8.8.1 SemiConductor Devices Details

8.8.2 SemiConductor Devices Major Business

8.8.3 SemiConductor Devices Quantum Dot Infrared Photodetectors Product and Services

8.8.4 SemiConductor Devices Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.8.5 SemiConductor Devices Recent Developments/Updates

8.8.6 SemiConductor Devices Competitive Strengths & Weaknesses

8.9 Excelitas Technologies

8.9.1 Excelitas Technologies Details

8.9.2 Excelitas Technologies Major Business

8.9.3 Excelitas Technologies Quantum Dot Infrared Photodetectors Product and Services

8.9.4 Excelitas Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.9.5 Excelitas Technologies Recent Developments/Updates

8.9.6 Excelitas Technologies Competitive Strengths & Weaknesses

8.10 Allied Vision Technologies

8.10.1 Allied Vision Technologies Details

8.10.2 Allied Vision Technologies Major Business

8.10.3 Allied Vision Technologies Quantum Dot Infrared Photodetectors Product and Services

8.10.4 Allied Vision Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.10.5 Allied Vision Technologies Recent Developments/Updates

8.10.6 Allied Vision Technologies Competitive Strengths & Weaknesses

8.11 New Imaging Technologies

8.11.1 New Imaging Technologies Details

8.11.2 New Imaging Technologies Major Business

8.11.3 New Imaging Technologies Quantum Dot Infrared Photodetectors Product and Services

8.11.4 New Imaging Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.11.5 New Imaging Technologies Recent Developments/Updates

8.11.6 New Imaging Technologies Competitive Strengths & Weaknesses

8.12 Princeton Infrared Technologies

8.12.1 Princeton Infrared Technologies Details

8.12.2 Princeton Infrared Technologies Major Business

8.12.3 Princeton Infrared Technologies Quantum Dot Infrared Photodetectors Product and Services

8.12.4 Princeton Infrared Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.12.5 Princeton Infrared Technologies Recent Developments/Updates

8.12.6 Princeton Infrared Technologies Competitive Strengths & Weaknesses

8.13 Himax Technologies

8.13.1 Himax Technologies Details

8.13.2 Himax Technologies Major Business

8.13.3 Himax Technologies Quantum Dot Infrared Photodetectors Product and Services

8.13.4 Himax Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.13.5 Himax Technologies Recent Developments/Updates

8.13.6 Himax Technologies Competitive Strengths & Weaknesses

8.14 OmniVision Technologies

8.14.1 OmniVision Technologies Details

8.14.2 OmniVision Technologies Major Business

8.14.3 OmniVision Technologies Quantum Dot Infrared Photodetectors Product and Services

8.14.4 OmniVision Technologies Quantum Dot Infrared Photodetectors Production, Price, Value, Gross Margin and Market Share (2021-2026)

8.14.5 OmniVision Technologies Recent Developments/Updates

8.14.6 OmniVision Technologies Competitive Strengths & Weaknesses

9 INDUSTRY CHAIN ANALYSIS

9.1 Quantum Dot Infrared Photodetectors Industry Chain

9.2 Quantum Dot Infrared Photodetectors Upstream Analysis

9.2.1 Quantum Dot Infrared Photodetectors Core Raw Materials

9.2.2 Main Manufacturers of Quantum Dot Infrared Photodetectors Core Raw Materials

9.3 Midstream Analysis

9.4 Downstream Analysis

9.5 Quantum Dot Infrared Photodetectors Production Mode

9.6 Quantum Dot Infrared Photodetectors Procurement Model

9.7 Quantum Dot Infrared Photodetectors Industry Sales Model and Sales Channels

9.7.1 Quantum Dot Infrared Photodetectors Sales Model

9.7.2 Quantum Dot Infrared Photodetectors Typical Distributors

10 RESEARCH FINDINGS AND CONCLUSION

11 APPENDIX

11.1 Methodology

11.2 Research Process and Data Source

11.3 Disclaimer

List Of Tables

LIST OF TABLES

Table 1. World Quantum Dot Infrared Photodetectors Production Value by Region (2021, 2025 and 2032) & (USD Million)

Table 2. World Quantum Dot Infrared Photodetectors Production Value by Region (2021-2026) & (USD Million)

Table 3. World Quantum Dot Infrared Photodetectors Production Value by Region (2027-2032) & (USD Million)

Table 4. World Quantum Dot Infrared Photodetectors Production Value Market Share by Region (2021-2026)

Table 5. World Quantum Dot Infrared Photodetectors Production Value Market Share by Region (2027-2032)

Table 6. World Quantum Dot Infrared Photodetectors Production by Region (2021-2026) & (K Units)

Table 7. World Quantum Dot Infrared Photodetectors Production by Region (2027-2032) & (K Units)

Table 8. World Quantum Dot Infrared Photodetectors Production Market Share by Region (2021-2026)

Table 9. World Quantum Dot Infrared Photodetectors Production Market Share by Region (2027-2032)

Table 10. World Quantum Dot Infrared Photodetectors Average Price by Region (2021-2026) & (US\$/Unit)

Table 11. World Quantum Dot Infrared Photodetectors Average Price by Region (2027-2032) & (US\$/Unit)

Table 12. Quantum Dot Infrared Photodetectors Major Market Trends

Table 13. World Quantum Dot Infrared Photodetectors Consumption Growth Rate Forecast by Region (2021 & 2025 & 2032) & (K Units)

Table 14. World Quantum Dot Infrared Photodetectors Consumption by Region (2021-2026) & (K Units)

Table 15. World Quantum Dot Infrared Photodetectors Consumption Forecast by Region (2027-2032) & (K Units)

Table 16. World Quantum Dot Infrared Photodetectors Production Value by Manufacturer (2021-2026) & (USD Million)

Table 17. Production Value Market Share of Key Quantum Dot Infrared Photodetectors Producers in 2025

Table 18. World Quantum Dot Infrared Photodetectors Production by Manufacturer (2021-2026) & (K Units)

Table 19. Production Market Share of Key Quantum Dot Infrared Photodetectors Producers in 2025

Table 20. World Quantum Dot Infrared Photodetectors Average Price by Manufacturer (2021-2026) & (US\$/Unit)

Table 21. Global Quantum Dot Infrared Photodetectors Company Evaluation Quadrant

Table 22. World Quantum Dot Infrared Photodetectors Industry Rank of Major Manufacturers, Based on Production Value in 2025

Table 23. Head Office and Quantum Dot Infrared Photodetectors Production Site of Key Manufacturer

Table 24. Quantum Dot Infrared Photodetectors Market: Company Product Type Footprint

Table 25. Quantum Dot Infrared Photodetectors Market: Company Product Application Footprint

Table 26. Quantum Dot Infrared Photodetectors Competitive Factors

Table 27. Quantum Dot Infrared Photodetectors New Entrant and Capacity Expansion Plans

Table 28. Quantum Dot Infrared Photodetectors Mergers & Acquisitions Activity

Table 29. United States VS China Quantum Dot Infrared Photodetectors Production Value Comparison, (2021 & 2025 & 2032) & (USD Million)

Table 30. United States VS China Quantum Dot Infrared Photodetectors Production Comparison, (2021 & 2025 & 2032) & (K Units)

Table 31. United States VS China Quantum Dot Infrared Photodetectors Consumption Comparison, (2021 & 2025 & 2032) & (K Units)

Table 32. United States Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (States, Country)

Table 33. United States Based Manufacturers Quantum Dot Infrared Photodetectors Production Value, (2021-2026) & (USD Million)

Table 34. United States Based Manufacturers Quantum Dot Infrared Photodetectors Production Value Market Share (2021-2026)

Table 35. United States Based Manufacturers Quantum Dot Infrared Photodetectors Production (2021-2026) & (K Units)

Table 36. United States Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share (2021-2026)

Table 37. China Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (Province, Country)

Table 38. China Based Manufacturers Quantum Dot Infrared Photodetectors Production Value, (2021-2026) & (USD Million)

Table 39. China Based Manufacturers Quantum Dot Infrared Photodetectors Production Value Market Share (2021-2026)

- Table 40. China Based Manufacturers Quantum Dot Infrared Photodetectors Production, (2021-2026) & (K Units)
- Table 41. China Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share (2021-2026)
- Table 42. Rest of World Based Quantum Dot Infrared Photodetectors Manufacturers, Headquarters and Production Site (State, Country)
- Table 43. Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production Value, (2021-2026) & (USD Million)
- Table 44. Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production Value Market Share (2021-2026)
- Table 45. Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production, (2021-2026) & (K Units)
- Table 46. Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share (2021-2026)
- Table 47. World Quantum Dot Infrared Photodetectors Production Value by Type, (USD Million), 2021 & 2025 & 2032
- Table 48. World Quantum Dot Infrared Photodetectors Production by Type (2021-2026) & (K Units)
- Table 49. World Quantum Dot Infrared Photodetectors Production by Type (2027-2032) & (K Units)
- Table 50. World Quantum Dot Infrared Photodetectors Production Value by Type (2021-2026) & (USD Million)
- Table 51. World Quantum Dot Infrared Photodetectors Production Value by Type (2027-2032) & (USD Million)
- Table 52. World Quantum Dot Infrared Photodetectors Average Price by Type (2021-2026) & (US\$/Unit)
- Table 53. World Quantum Dot Infrared Photodetectors Average Price by Type (2027-2032) & (US\$/Unit)
- Table 54. World Quantum Dot Infrared Photodetectors Production Value by Quantum Dot Material, (USD Million), 2021 & 2025 & 2032
- Table 55. World Quantum Dot Infrared Photodetectors Production by Quantum Dot Material (2021-2026) & (K Units)
- Table 56. World Quantum Dot Infrared Photodetectors Production by Quantum Dot Material (2027-2032) & (K Units)
- Table 57. World Quantum Dot Infrared Photodetectors Production Value by Quantum Dot Material (2021-2026) & (USD Million)
- Table 58. World Quantum Dot Infrared Photodetectors Production Value by Quantum Dot Material (2027-2032) & (USD Million)
- Table 59. World Quantum Dot Infrared Photodetectors Average Price by Quantum Dot

Material (2021-2026) & (US\$/Unit)

Table 60. World Quantum Dot Infrared Photodetectors Average Price by Quantum Dot Material (2027-2032) & (US\$/Unit)

Table 61. World Quantum Dot Infrared Photodetectors Production Value by Application, (USD Million), 2021 & 2025 & 2032

Table 62. World Quantum Dot Infrared Photodetectors Production by Application (2021-2026) & (K Units)

Table 63. World Quantum Dot Infrared Photodetectors Production by Application (2027-2032) & (K Units)

Table 64. World Quantum Dot Infrared Photodetectors Production Value by Application (2021-2026) & (USD Million)

Table 65. World Quantum Dot Infrared Photodetectors Production Value by Application (2027-2032) & (USD Million)

Table 66. World Quantum Dot Infrared Photodetectors Average Price by Application (2021-2026) & (US\$/Unit)

Table 67. World Quantum Dot Infrared Photodetectors Average Price by Application (2027-2032) & (US\$/Unit)

Table 68. SWIR Vision Systems Basic Information, Manufacturing Base and Competitors

Table 69. SWIR Vision Systems Major Business

Table 70. SWIR Vision Systems Quantum Dot Infrared Photodetectors Product and Services

Table 71. SWIR Vision Systems Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 72. SWIR Vision Systems Recent Developments/Updates

Table 73. SWIR Vision Systems Competitive Strengths & Weaknesses

Table 74. Emberion Basic Information, Manufacturing Base and Competitors

Table 75. Emberion Major Business

Table 76. Emberion Quantum Dot Infrared Photodetectors Product and Services

Table 77. Emberion Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 78. Emberion Recent Developments/Updates

Table 79. Emberion Competitive Strengths & Weaknesses

Table 80. QDI Systems Basic Information, Manufacturing Base and Competitors

Table 81. QDI Systems Major Business

Table 82. QDI Systems Quantum Dot Infrared Photodetectors Product and Services

Table 83. QDI Systems Quantum Dot Infrared Photodetectors Production (K Units),

Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 84. QDI Systems Recent Developments/Updates

Table 85. QDI Systems Competitive Strengths & Weaknesses

Table 86. Aeluma Basic Information, Manufacturing Base and Competitors

Table 87. Aeluma Major Business

Table 88. Aeluma Quantum Dot Infrared Photodetectors Product and Services

Table 89. Aeluma Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 90. Aeluma Recent Developments/Updates

Table 91. Aeluma Competitive Strengths & Weaknesses

Table 92. Hamamatsu Photonics Basic Information, Manufacturing Base and Competitors

Table 93. Hamamatsu Photonics Major Business

Table 94. Hamamatsu Photonics Quantum Dot Infrared Photodetectors Product and Services

Table 95. Hamamatsu Photonics Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 96. Hamamatsu Photonics Recent Developments/Updates

Table 97. Hamamatsu Photonics Competitive Strengths & Weaknesses

Table 98. Teledyne Technologies Basic Information, Manufacturing Base and Competitors

Table 99. Teledyne Technologies Major Business

Table 100. Teledyne Technologies Quantum Dot Infrared Photodetectors Product and Services

Table 101. Teledyne Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 102. Teledyne Technologies Recent Developments/Updates

Table 103. Teledyne Technologies Competitive Strengths & Weaknesses

Table 104. Leonardo DRS Basic Information, Manufacturing Base and Competitors

Table 105. Leonardo DRS Major Business

Table 106. Leonardo DRS Quantum Dot Infrared Photodetectors Product and Services

Table 107. Leonardo DRS Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

Table 108. Leonardo DRS Recent Developments/Updates

- Table 109. Leonardo DRS Competitive Strengths & Weaknesses
- Table 110. SemiConductor Devices Basic Information, Manufacturing Base and Competitors
- Table 111. SemiConductor Devices Major Business
- Table 112. SemiConductor Devices Quantum Dot Infrared Photodetectors Product and Services
- Table 113. SemiConductor Devices Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 114. SemiConductor Devices Recent Developments/Updates
- Table 115. SemiConductor Devices Competitive Strengths & Weaknesses
- Table 116. Excelitas Technologies Basic Information, Manufacturing Base and Competitors
- Table 117. Excelitas Technologies Major Business
- Table 118. Excelitas Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 119. Excelitas Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 120. Excelitas Technologies Recent Developments/Updates
- Table 121. Excelitas Technologies Competitive Strengths & Weaknesses
- Table 122. Allied Vision Technologies Basic Information, Manufacturing Base and Competitors
- Table 123. Allied Vision Technologies Major Business
- Table 124. Allied Vision Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 125. Allied Vision Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 126. Allied Vision Technologies Recent Developments/Updates
- Table 127. Allied Vision Technologies Competitive Strengths & Weaknesses
- Table 128. New Imaging Technologies Basic Information, Manufacturing Base and Competitors
- Table 129. New Imaging Technologies Major Business
- Table 130. New Imaging Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 131. New Imaging Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)

- Table 132. New Imaging Technologies Recent Developments/Updates
- Table 133. New Imaging Technologies Competitive Strengths & Weaknesses
- Table 134. Princeton Infrared Technologies Basic Information, Manufacturing Base and Competitors
- Table 135. Princeton Infrared Technologies Major Business
- Table 136. Princeton Infrared Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 137. Princeton Infrared Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 138. Princeton Infrared Technologies Recent Developments/Updates
- Table 139. Princeton Infrared Technologies Competitive Strengths & Weaknesses
- Table 140. Himax Technologies Basic Information, Manufacturing Base and Competitors
- Table 141. Himax Technologies Major Business
- Table 142. Himax Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 143. Himax Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 144. Himax Technologies Recent Developments/Updates
- Table 145. Himax Technologies Competitive Strengths & Weaknesses
- Table 146. OmniVision Technologies Basic Information, Manufacturing Base and Competitors
- Table 147. OmniVision Technologies Major Business
- Table 148. OmniVision Technologies Quantum Dot Infrared Photodetectors Product and Services
- Table 149. OmniVision Technologies Quantum Dot Infrared Photodetectors Production (K Units), Price (US\$/Unit), Production Value (USD Million), Gross Margin and Market Share (2021-2026)
- Table 150. OmniVision Technologies Recent Developments/Updates
- Table 151. OmniVision Technologies Competitive Strengths & Weaknesses
- Table 152. Global Key Players of Quantum Dot Infrared Photodetectors Upstream (Raw Materials)
- Table 153. Global Quantum Dot Infrared Photodetectors Typical Customers
- Table 154. Quantum Dot Infrared Photodetectors Typical Distributors

List Of Figures

LIST OF FIGURES

Figure 1. Quantum Dot Infrared Photodetectors Picture

Figure 2. World Quantum Dot Infrared Photodetectors Production Value: 2021 & 2025 & 2032, (USD Million)

Figure 3. World Quantum Dot Infrared Photodetectors Production Value and Forecast (2021-2032) & (USD Million)

Figure 4. World Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 5. World Quantum Dot Infrared Photodetectors Average Price (2021-2032) & (US\$/Unit)

Figure 6. World Quantum Dot Infrared Photodetectors Production Value Market Share by Region (2021-2032)

Figure 7. World Quantum Dot Infrared Photodetectors Production Market Share by Region (2021-2032)

Figure 8. North America Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 9. Europe Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 10. China Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 11. Japan Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 12. South Korea Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 13. Southeast Asia Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 14. China Taiwan Quantum Dot Infrared Photodetectors Production (2021-2032) & (K Units)

Figure 15. Quantum Dot Infrared Photodetectors Market Drivers

Figure 16. Factors Affecting Demand

Figure 17. World Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 18. World Quantum Dot Infrared Photodetectors Consumption Market Share by Region (2021-2032)

Figure 19. United States Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 20. China Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 21. Europe Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 22. Japan Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 23. South Korea Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 24. ASEAN Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 25. India Quantum Dot Infrared Photodetectors Consumption (2021-2032) & (K Units)

Figure 26. Producer Shipments of Quantum Dot Infrared Photodetectors by Manufacturer Revenue (\$MM) and Market Share (%): 2025

Figure 27. Global Four-firm Concentration Ratios (CR4) for Quantum Dot Infrared Photodetectors Markets in 2025

Figure 28. Global Four-firm Concentration Ratios (CR8) for Quantum Dot Infrared Photodetectors Markets in 2025

Figure 29. United States VS China: Quantum Dot Infrared Photodetectors Production Value Market Share Comparison (2021 & 2025 & 2032)

Figure 30. United States VS China: Quantum Dot Infrared Photodetectors Production Market Share Comparison (2021 & 2025 & 2032)

Figure 31. United States VS China: Quantum Dot Infrared Photodetectors Consumption Market Share Comparison (2021 & 2025 & 2032)

Figure 32. United States Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share 2025

Figure 33. China Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share 2025

Figure 34. Rest of World Based Manufacturers Quantum Dot Infrared Photodetectors Production Market Share 2025

Figure 35. World Quantum Dot Infrared Photodetectors Production Value by Type, (USD Million), 2021 & 2025 & 2032

Figure 36. World Quantum Dot Infrared Photodetectors Production Value Market Share by Type in 2025

Figure 37. Short-Wave Infrared (SWIR) QDIPs

Figure 38. Mid-Wave Infrared (MWIR) QDIPs

Figure 39. Long-Wave Infrared (LWIR) QDIPs

Figure 40. Broadband Infrared QDIPs

Figure 41. World Quantum Dot Infrared Photodetectors Production Market Share by

Type (2021-2032)

Figure 42. World Quantum Dot Infrared Photodetectors Production Value Market Share by Type (2021-2032)

Figure 43. World Quantum Dot Infrared Photodetectors Average Price by Type (2021-2032) & (US\$/Unit)

Figure 44. World Quantum Dot Infrared Photodetectors Production Value by Quantum Dot Material, (USD Million), 2021 & 2025 & 2032

Figure 45. World Quantum Dot Infrared Photodetectors Production Value Market Share by Quantum Dot Material in 2025

Figure 46. Lead Sulfide (PbS)

Figure 47. Lead Selenide (PbSe)

Figure 48. Mercury Telluride (HgTe)

Figure 49. Cadmium Selenide (CdSe)

Figure 50. Indium Arsenide (InAs)

Figure 51. Gallium Arsenide (GaAs)

Figure 52. World Quantum Dot Infrared Photodetectors Production Market Share by Quantum Dot Material (2021-2032)

Figure 53. World Quantum Dot Infrared Photodetectors Production Value Market Share by Quantum Dot Material (2021-2032)

Figure 54. World Quantum Dot Infrared Photodetectors Average Price by Quantum Dot Material (2021-2032) & (US\$/Unit)

Figure 55. World Quantum Dot Infrared Photodetectors Production Value by Application, (USD Million), 2021 & 2025 & 2032

Figure 56. World Quantum Dot Infrared Photodetectors Production Value Market Share by Application in 2025

Figure 57. Aerospace & Defense

Figure 58. Security & Surveillance

Figure 59. Automotive

Figure 60. Industrial

Figure 61. Environmental

Figure 62. Agricultural

Figure 63. Medical

Figure 64. Others

Figure 65. Others

Figure 66. World Quantum Dot Infrared Photodetectors Production Market Share by Application (2021-2032)

Figure 67. World Quantum Dot Infrared Photodetectors Production Value Market Share by Application (2021-2032)

Figure 68. World Quantum Dot Infrared Photodetectors Average Price by Application

(2021-2032) & (US\$/Unit)

Figure 69. Quantum Dot Infrared Photodetectors Industry Chain

Figure 70. Quantum Dot Infrared Photodetectors Procurement Model

Figure 71. Quantum Dot Infrared Photodetectors Sales Model

Figure 72. Quantum Dot Infrared Photodetectors Sales Channels, Direct Sales, and Distribution

Figure 73. Methodology

Figure 74. Research Process and Data Source

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