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

https://marketpublishers.com/r/G20507776E83EN.html
Date: April 2026
Pages: 129
Price: US$ 4,480.00 (Single User License)
ID: G20507776E83EN

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.

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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,

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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:

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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

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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?

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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?

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