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Global Single-Photon Avalanche Photodiode (SPAD) Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Single-Photon Avalanche Photodiode (SPAD) market size was valued at US$ 320 million in 2025 and is forecast to a readjusted size of US$ 602 million by 2032 with a CAGR of 9.6% during review period.

The Single-Photon Avalanche Diode (SPAD) is an avalanche photodiode that operates in Geiger Mode (with a reverse bias voltage higher than the breakdown voltage). Its core mechanism involves a single photon triggering a transverse ionization avalanche, instantly generating a countable current pulse, enabling single-photon level detection and picosecond time resolution. Compared to linear-mode avalanche photodiodes (APD), the output of a SPAD is a binary 'Click' event, and single-photon counting can be achieved without the need for an external low-noise amplifier.

Market Size Steadily Expanding, Focus Shifting Eastward

The global Single-Photon Avalanche Diode (SPAD) market is expected to reach a sales volume of $282 million in 2024, with a projected compound annual growth rate (CAGR) of 9.9% from 2025 to 2031. Driven by the growth of 3D sensing terminals and automotive-grade LiDAR in China, the sales share in China will increase from 39% in 2024 to 47%, surpassing North America and Europe to become the largest single consumer region.

Supply Side Showing 'Bipolar' Development?China and Japan/US/Europe in Parallel

On the production side, China's share will rise from 26.9% in 2020 to 48.7% in 2031F,

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primarily due to the launch of domestic 12-inch 3D-Stack + InGaAs-NFAD lines.

Traditional strongholds like Japan and the US maintain high barriers in materials and processes but will see a slight decline in overall market share.

High-end production lines such as Crolles 300 mm and Sony Kumamoto BSI-SPAD ensure that Europe and Japan retain technical leadership in long-range LiDAR and SWIR applications.

Product Structure: Short-Wave Infrared (SWIR) Is the Next Focus for Volume and Price Growth

The sales share of SWIR-SPAD is expected to rise from 13% in 2024 to 17%, with its sales value share increasing to 26%, driven by the growth of 1550 nm Flash/FMCW LiDAR and quantum communication applications. Visible light-near-infrared (VIS/NIR) will remain the dominant segment in terms of volume, but its average selling price (ASP) will see a stable decline, with functionality evolving from single-point to area-array and integrated SoC designs.

Accelerated Shift in Application Structure

The penetration of communication and consumer electronics is nearing saturation (with sales share decreasing from 60% to 40%). The automotive sector will see a CAGR of 15%, and by 2031, its sales share is expected to exceed 25%, becoming the leading growth segment. The medical and industrial sectors will continue to grow at double-digit rates, contributing to long-tail, high-margin growth.

Technological Landscape: 3D-Stack + Hybrid Bonding Becoming Mainstream

Pixels of 10 ?m or below, Hybrid-Cu-Cu bonding, and on-chip multi-TDC histogram statistics are becoming essential for BSI-SPAD. The InGaAs / Ge-on-Si route will continue to migrate to the 300 mm CMOS platform, leading to rapid improvements in dark count rate (DCR) and pixel consistency. Multi-threshold counting (MPC), on-chip temperature compensation, and AI-ISP integration will drive the next round of differentiation.

This report is a detailed and comprehensive analysis for global Single-Photon Avalanche Photodiode (SPAD) market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the

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market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Single-Photon Avalanche Photodiode (SPAD) market size and forecasts, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Single-Photon Avalanche Photodiode (SPAD) market size and forecasts by region and country, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Single-Photon Avalanche Photodiode (SPAD) market size and forecasts, by Type and by Application, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Single-Photon Avalanche Photodiode (SPAD) market shares of main players, shipments in revenue ($ Million), sales quantity (K Units), and ASP (US$/Unit), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for Single-Photon Avalanche Photodiode (SPAD)

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Single-Photon Avalanche Photodiode (SPAD) market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include

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STMicroelectronics, Adaps Photonics, Hamamatsu, Onsemi, Excelitas, Micro Photon Devices, Sony Semiconductor Solutions, Laser Components, Runmingyu Electronics Technology, etc.

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

Market Segmentation

Single-Photon Avalanche Photodiode (SPAD) market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Type

Visible Light

Near-Infrared

Short-Wave Infrared

Mid-Long-Wave Infrared

Market segment by Material

Si-SPAD

InGaAs/InP-SPAD

HgCdTe / Ge / Ge-on-Si

Market segment by Operating Voltage

Below 50V

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Above 50V

Market segment by Application

Telecommunications & Consumer Electronics

Automotive

Medical

Industrial

Other

Major players covered

STMicroelectronics

Adaps Photonics

Hamamatsu

Onsemi

Excelitas

Micro Photon Devices

Sony Semiconductor Solutions

Laser Components

Runmingyu Electronics Technology

Market segment by region, regional analysis covers

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North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Single-Photon Avalanche Photodiode (SPAD) product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Single-Photon Avalanche Photodiode (SPAD), with price, sales quantity, revenue, and global market share of Single-Photon Avalanche Photodiode (SPAD) from 2021 to 2026.

Chapter 3, the Single-Photon Avalanche Photodiode (SPAD) competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Single-Photon Avalanche Photodiode (SPAD) breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026.and Single-Photon Avalanche Photodiode (SPAD) market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

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Chapter 13, the key raw materials and key suppliers, and industry chain of Single-Photon Avalanche Photodiode (SPAD).

Chapter 14 and 15, to describe Single-Photon Avalanche Photodiode (SPAD) sales channel, distributors, customers, research findings and conclusion.

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