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Global Single-Photon Avalanche Photodiode (SPAD) Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Single-Photon Avalanche Photodiode (SPAD) market size is expected to reach $ 602 million by 2032, rising at a market growth of 9.6% CAGR during the forecast period (2026-2032).
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, 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

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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 studies the global Single-Photon Avalanche Photodiode (SPAD) production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Single-Photon Avalanche Photodiode (SPAD) 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 Single-Photon Avalanche Photodiode (SPAD) that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Single-Photon Avalanche Photodiode (SPAD) total production and demand, 2021-2032, (K Units)

Global Single-Photon Avalanche Photodiode (SPAD) total production value, 2021-2032, (USD Million)

Global Single-Photon Avalanche Photodiode (SPAD) production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Single-Photon Avalanche Photodiode (SPAD) consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Single-Photon Avalanche Photodiode (SPAD) domestic production,

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consumption, key domestic manufacturers and share
Global Single-Photon Avalanche Photodiode (SPAD) production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)
Global Single-Photon Avalanche Photodiode (SPAD) production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)
Global Single-Photon Avalanche Photodiode (SPAD) production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)
This report profiles key players in the global Single-Photon Avalanche Photodiode (SPAD) 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 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.
Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Single-Photon Avalanche Photodiode (SPAD) 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 Single-Photon Avalanche Photodiode (SPAD) Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

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Rest of World

Global Single-Photon Avalanche Photodiode (SPAD) Market, Segmentation by Type:

Visible Light

Near-Infrared

Short-Wave Infrared

Mid-Long-Wave Infrared

Global Single-Photon Avalanche Photodiode (SPAD) Market, Segmentation by Material:

Si-SPAD

InGaAs/InP-SPAD

HgCdTe / Ge / Ge-on-Si

Global Single-Photon Avalanche Photodiode (SPAD) Market, Segmentation by Operating Voltage:

Below 50V

Above 50V

Global Single-Photon Avalanche Photodiode (SPAD) Market, Segmentation by Application:

Telecommunications & Consumer Electronics

Automotive

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Medical

Industrial

Other

Companies Profiled:

STMicroelectronics

Adaps Photonics

Hamamatsu

Onsemi

Excelitas

Micro Photon Devices

Sony Semiconductor Solutions

Laser Components

Runmingyu Electronics Technology

Key Questions Answered:

1. How big is the global Single-Photon Avalanche Photodiode (SPAD) market?
2. What is the demand of the global Single-Photon Avalanche Photodiode (SPAD) market?
3. What is the year over year growth of the global Single-Photon Avalanche Photodiode (SPAD) market?
4. What is the production and production value of the global Single-Photon Avalanche Photodiode (SPAD) market?
5. Who are the key producers in the global Single-Photon Avalanche Photodiode (SPAD) market?
6. What are the growth factors driving the market demand?

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