

# 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,

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  $\mu$ 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

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

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

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

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.

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.

## Contents

### 1 MARKET OVERVIEW

1.1 Product Overview and Scope

1.2 Market Estimation Caveats and Base Year

1.3 Market Analysis by Type

1.3.1 Overview: Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Type: 2021 Versus 2025 Versus 2032

1.3.2 Visible Light

1.3.3 Near-Infrared

1.3.4 Short-Wave Infrared

1.3.5 Mid-Long-Wave Infrared

1.4 Market Analysis by Material

1.4.1 Overview: Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Material: 2021 Versus 2025 Versus 2032

1.4.2 Si-SPAD

1.4.3 InGaAs/InP-SPAD

1.4.4 HgCdTe / Ge / Ge-on-Si

1.5 Market Analysis by Operating Voltage

1.5.1 Overview: Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Operating Voltage: 2021 Versus 2025 Versus 2032

1.5.2 Below 50V

1.5.3 Above 50V

1.6 Market Analysis by Application

1.6.1 Overview: Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application: 2021 Versus 2025 Versus 2032

1.6.2 Telecommunications & Consumer Electronics

1.6.3 Automotive

1.6.4 Medical

1.6.5 Industrial

1.6.6 Other

1.7 Global Single-Photon Avalanche Photodiode (SPAD) Market Size & Forecast

1.7.1 Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021 & 2025 & 2032)

1.7.2 Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (2021-2032)

1.7.3 Global Single-Photon Avalanche Photodiode (SPAD) Average Price (2021-2032)

### 2 MANUFACTURERS PROFILES

## 2.1 STMicroelectronics

2.1.1 STMicroelectronics Details

2.1.2 STMicroelectronics Major Business

2.1.3 STMicroelectronics Single-Photon Avalanche Photodiode (SPAD) Product and Services

2.1.4 STMicroelectronics Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)

2.1.5 STMicroelectronics Recent Developments/Updates

## 2.2 Adaps Photonics

2.2.1 Adaps Photonics Details

2.2.2 Adaps Photonics Major Business

2.2.3 Adaps Photonics Single-Photon Avalanche Photodiode (SPAD) Product and Services

2.2.4 Adaps Photonics Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)

2.2.5 Adaps Photonics Recent Developments/Updates

## 2.3 Hamamatsu

2.3.1 Hamamatsu Details

2.3.2 Hamamatsu Major Business

2.3.3 Hamamatsu Single-Photon Avalanche Photodiode (SPAD) Product and Services

2.3.4 Hamamatsu Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)

2.3.5 Hamamatsu Recent Developments/Updates

## 2.4 Onsemi

2.4.1 Onsemi Details

2.4.2 Onsemi Major Business

2.4.3 Onsemi Single-Photon Avalanche Photodiode (SPAD) Product and Services

2.4.4 Onsemi Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)

2.4.5 Onsemi Recent Developments/Updates

## 2.5 Excelitas

2.5.1 Excelitas Details

2.5.2 Excelitas Major Business

2.5.3 Excelitas Single-Photon Avalanche Photodiode (SPAD) Product and Services

2.5.4 Excelitas Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)

2.5.5 Excelitas Recent Developments/Updates

## 2.6 Micro Photon Devices

- 2.6.1 Micro Photon Devices Details
- 2.6.2 Micro Photon Devices Major Business
- 2.6.3 Micro Photon Devices Single-Photon Avalanche Photodiode (SPAD) Product and Services
- 2.6.4 Micro Photon Devices Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)
- 2.6.5 Micro Photon Devices Recent Developments/Updates
- 2.7 Sony Semiconductor Solutions
  - 2.7.1 Sony Semiconductor Solutions Details
  - 2.7.2 Sony Semiconductor Solutions Major Business
  - 2.7.3 Sony Semiconductor Solutions Single-Photon Avalanche Photodiode (SPAD) Product and Services
  - 2.7.4 Sony Semiconductor Solutions Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)
  - 2.7.5 Sony Semiconductor Solutions Recent Developments/Updates
- 2.8 Laser Components
  - 2.8.1 Laser Components Details
  - 2.8.2 Laser Components Major Business
  - 2.8.3 Laser Components Single-Photon Avalanche Photodiode (SPAD) Product and Services
  - 2.8.4 Laser Components Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)
  - 2.8.5 Laser Components Recent Developments/Updates
- 2.9 Runmingyu Electronics Technology
  - 2.9.1 Runmingyu Electronics Technology Details
  - 2.9.2 Runmingyu Electronics Technology Major Business
  - 2.9.3 Runmingyu Electronics Technology Single-Photon Avalanche Photodiode (SPAD) Product and Services
  - 2.9.4 Runmingyu Electronics Technology Single-Photon Avalanche Photodiode (SPAD) Sales Quantity, Average Price, Revenue, Gross Margin and Market Share (2021-2026)
  - 2.9.5 Runmingyu Electronics Technology Recent Developments/Updates

### **3 COMPETITIVE ENVIRONMENT: SINGLE-PHOTON AVALANCHE PHOTODIODE (SPAD) BY MANUFACTURER**

- 3.1 Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Manufacturer (2021-2026)
- 3.2 Global Single-Photon Avalanche Photodiode (SPAD) Revenue by Manufacturer

(2021-2026)

3.3 Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Manufacturer (2021-2026)

3.4 Market Share Analysis (2025)

3.4.1 Producer Shipments of Single-Photon Avalanche Photodiode (SPAD) by Manufacturer Revenue (\$MM) and Market Share (%): 2025

3.4.2 Top 3 Single-Photon Avalanche Photodiode (SPAD) Manufacturer Market Share in 2025

3.4.3 Top 6 Single-Photon Avalanche Photodiode (SPAD) Manufacturer Market Share in 2025

3.5 Single-Photon Avalanche Photodiode (SPAD) Market: Overall Company Footprint Analysis

3.5.1 Single-Photon Avalanche Photodiode (SPAD) Market: Region Footprint

3.5.2 Single-Photon Avalanche Photodiode (SPAD) Market: Company Product Type Footprint

3.5.3 Single-Photon Avalanche Photodiode (SPAD) Market: Company Product Application Footprint

3.6 New Market Entrants and Barriers to Market Entry

3.7 Mergers, Acquisition, Agreements, and Collaborations

## **4 CONSUMPTION ANALYSIS BY REGION**

4.1 Global Single-Photon Avalanche Photodiode (SPAD) Market Size by Region

4.1.1 Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2021-2032)

4.1.2 Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2021-2032)

4.1.3 Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Region (2021-2032)

4.2 North America Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032)

4.3 Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032)

4.4 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032)

4.5 South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032)

4.6 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032)

## **5 MARKET SEGMENT BY TYPE**

5.1 Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

5.2 Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Type (2021-2032)

5.3 Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Type (2021-2032)

## **6 MARKET SEGMENT BY APPLICATION**

6.1 Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

6.2 Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application (2021-2032)

6.3 Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Application (2021-2032)

## **7 NORTH AMERICA**

7.1 North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

7.2 North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

7.3 North America Single-Photon Avalanche Photodiode (SPAD) Market Size by Country

7.3.1 North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2032)

7.3.2 North America Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2032)

7.3.3 United States Market Size and Forecast (2021-2032)

7.3.4 Canada Market Size and Forecast (2021-2032)

7.3.5 Mexico Market Size and Forecast (2021-2032)

## **8 EUROPE**

8.1 Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

8.2 Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

8.3 Europe Single-Photon Avalanche Photodiode (SPAD) Market Size by Country

8.3.1 Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2032)

8.3.2 Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2032)

8.3.3 Germany Market Size and Forecast (2021-2032)

8.3.4 France Market Size and Forecast (2021-2032)

8.3.5 United Kingdom Market Size and Forecast (2021-2032)

8.3.6 Russia Market Size and Forecast (2021-2032)

8.3.7 Italy Market Size and Forecast (2021-2032)

## **9 ASIA-PACIFIC**

9.1 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

9.2 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

9.3 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Market Size by Region

9.3.1 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2021-2032)

9.3.2 Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2021-2032)

9.3.3 China Market Size and Forecast (2021-2032)

9.3.4 Japan Market Size and Forecast (2021-2032)

9.3.5 South Korea Market Size and Forecast (2021-2032)

9.3.6 India Market Size and Forecast (2021-2032)

9.3.7 Southeast Asia Market Size and Forecast (2021-2032)

9.3.8 Australia Market Size and Forecast (2021-2032)

## **10 SOUTH AMERICA**

10.1 South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

10.2 South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

10.3 South America Single-Photon Avalanche Photodiode (SPAD) Market Size by Country

10.3.1 South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2032)

10.3.2 South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2032)

10.3.3 Brazil Market Size and Forecast (2021-2032)

10.3.4 Argentina Market Size and Forecast (2021-2032)

## **11 MIDDLE EAST & AFRICA**

11.1 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2032)

11.2 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2032)

11.3 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Market Size by Country

11.3.1 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2032)

11.3.2 Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2032)

11.3.3 Turkey Market Size and Forecast (2021-2032)

11.3.4 Egypt Market Size and Forecast (2021-2032)

11.3.5 Saudi Arabia Market Size and Forecast (2021-2032)

11.3.6 South Africa Market Size and Forecast (2021-2032)

## **12 MARKET DYNAMICS**

12.1 Single-Photon Avalanche Photodiode (SPAD) Market Drivers

12.2 Single-Photon Avalanche Photodiode (SPAD) Market Restraints

12.3 Single-Photon Avalanche Photodiode (SPAD) Trends Analysis

12.4 Porters Five Forces Analysis

12.4.1 Threat of New Entrants

12.4.2 Bargaining Power of Suppliers

12.4.3 Bargaining Power of Buyers

12.4.4 Threat of Substitutes

12.4.5 Competitive Rivalry

## **13 RAW MATERIAL AND INDUSTRY CHAIN**

13.1 Raw Material of Single-Photon Avalanche Photodiode (SPAD) and Key

## Manufacturers

13.2 Manufacturing Costs Percentage of Single-Photon Avalanche Photodiode (SPAD)

13.3 Single-Photon Avalanche Photodiode (SPAD) Production Process

13.4 Industry Value Chain Analysis

## **14 SHIPMENTS BY DISTRIBUTION CHANNEL**

14.1 Sales Channel

14.1.1 Direct to End-User

14.1.2 Distributors

14.2 Single-Photon Avalanche Photodiode (SPAD) Typical Distributors

14.3 Single-Photon Avalanche Photodiode (SPAD) Typical Customers

## **15 RESEARCH FINDINGS AND CONCLUSION**

## **16 APPENDIX**

16.1 Methodology

16.2 Research Process and Data Source

16.3 Disclaimer

## List Of Tables

### LIST OF TABLES

- Table 1. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Type, (USD Million), 2021 & 2025 & 2032
- Table 2. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Material, (USD Million), 2021 & 2025 & 2032
- Table 3. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Operating Voltage, (USD Million), 2021 & 2025 & 2032
- Table 4. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application, (USD Million), 2021 & 2025 & 2032
- Table 5. STMicroelectronics Basic Information, Manufacturing Base and Competitors
- Table 6. STMicroelectronics Major Business
- Table 7. STMicroelectronics Single-Photon Avalanche Photodiode (SPAD) Product and Services
- Table 8. STMicroelectronics Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)
- Table 9. STMicroelectronics Recent Developments/Updates
- Table 10. Adaps Photonics Basic Information, Manufacturing Base and Competitors
- Table 11. Adaps Photonics Major Business
- Table 12. Adaps Photonics Single-Photon Avalanche Photodiode (SPAD) Product and Services
- Table 13. Adaps Photonics Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)
- Table 14. Adaps Photonics Recent Developments/Updates
- Table 15. Hamamatsu Basic Information, Manufacturing Base and Competitors
- Table 16. Hamamatsu Major Business
- Table 17. Hamamatsu Single-Photon Avalanche Photodiode (SPAD) Product and Services
- Table 18. Hamamatsu Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)
- Table 19. Hamamatsu Recent Developments/Updates
- Table 20. Onsemi Basic Information, Manufacturing Base and Competitors
- Table 21. Onsemi Major Business
- Table 22. Onsemi Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 23. Onsemi Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 24. Onsemi Recent Developments/Updates

Table 25. Excelitas Basic Information, Manufacturing Base and Competitors

Table 26. Excelitas Major Business

Table 27. Excelitas Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 28. Excelitas Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 29. Excelitas Recent Developments/Updates

Table 30. Micro Photon Devices Basic Information, Manufacturing Base and Competitors

Table 31. Micro Photon Devices Major Business

Table 32. Micro Photon Devices Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 33. Micro Photon Devices Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 34. Micro Photon Devices Recent Developments/Updates

Table 35. Sony Semiconductor Solutions Basic Information, Manufacturing Base and Competitors

Table 36. Sony Semiconductor Solutions Major Business

Table 37. Sony Semiconductor Solutions Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 38. Sony Semiconductor Solutions Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 39. Sony Semiconductor Solutions Recent Developments/Updates

Table 40. Laser Components Basic Information, Manufacturing Base and Competitors

Table 41. Laser Components Major Business

Table 42. Laser Components Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 43. Laser Components Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 44. Laser Components Recent Developments/Updates

Table 45. Runmingyu Electronics Technology Basic Information, Manufacturing Base and Competitors

Table 46. Runmingyu Electronics Technology Major Business

Table 47. Runmingyu Electronics Technology Single-Photon Avalanche Photodiode (SPAD) Product and Services

Table 48. Runmingyu Electronics Technology Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (K Units), Average Price (US\$/Unit), Revenue (USD Million), Gross Margin and Market Share (2021-2026)

Table 49. Runmingyu Electronics Technology Recent Developments/Updates

Table 50. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Manufacturer (2021-2026) & (K Units)

Table 51. Global Single-Photon Avalanche Photodiode (SPAD) Revenue by Manufacturer (2021-2026) & (USD Million)

Table 52. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Manufacturer (2021-2026) & (US\$/Unit)

Table 53. Market Position of Manufacturers in Single-Photon Avalanche Photodiode (SPAD), (Tier 1, Tier 2, and Tier 3), Based on Revenue in 2025

Table 54. Head Office and Single-Photon Avalanche Photodiode (SPAD) Production Site of Key Manufacturer

Table 55. Single-Photon Avalanche Photodiode (SPAD) Market: Company Product Type Footprint

Table 56. Single-Photon Avalanche Photodiode (SPAD) Market: Company Product Application Footprint

Table 57. Single-Photon Avalanche Photodiode (SPAD) New Market Entrants and Barriers to Market Entry

Table 58. Single-Photon Avalanche Photodiode (SPAD) Mergers, Acquisition, Agreements, and Collaborations

Table 59. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2021-2025-2032) & (USD Million) & CAGR

Table 60. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2021-2026) & (K Units)

Table 61. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2027-2032) & (K Units)

Table 62. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2021-2026) & (USD Million)

Table 63. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2027-2032) & (USD Million)

Table 64. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Region (2021-2026) & (US\$/Unit)

Table 65. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Region (2027-2032) & (US\$/Unit)

Table 66. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 67. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 68. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Type (2021-2026) & (USD Million)

Table 69. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Type (2027-2032) & (USD Million)

Table 70. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Type (2021-2026) & (US\$/Unit)

Table 71. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Type (2027-2032) & (US\$/Unit)

Table 72. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 73. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 74. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application (2021-2026) & (USD Million)

Table 75. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application (2027-2032) & (USD Million)

Table 76. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Application (2021-2026) & (US\$/Unit)

Table 77. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Application (2027-2032) & (US\$/Unit)

Table 78. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 79. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 80. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 81. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 82. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2026) & (K Units)

Table 83. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2027-2032) & (K Units)

Table 84. North America Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2026) & (USD Million)

Table 85. North America Single-Photon Avalanche Photodiode (SPAD) Consumption

Value by Country (2027-2032) & (USD Million)

Table 86. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 87. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 88. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 89. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 90. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2026) & (K Units)

Table 91. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2027-2032) & (K Units)

Table 92. Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2026) & (USD Million)

Table 93. Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2027-2032) & (USD Million)

Table 94. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 95. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 96. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 97. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 98. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2021-2026) & (K Units)

Table 99. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Region (2027-2032) & (K Units)

Table 100. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2021-2026) & (USD Million)

Table 101. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Region (2027-2032) & (USD Million)

Table 102. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 103. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 104. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 105. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 106. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2026) & (K Units)

Table 107. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2027-2032) & (K Units)

Table 108. South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2026) & (USD Million)

Table 109. South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2027-2032) & (USD Million)

Table 110. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2021-2026) & (K Units)

Table 111. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Type (2027-2032) & (K Units)

Table 112. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2021-2026) & (K Units)

Table 113. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Application (2027-2032) & (K Units)

Table 114. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2021-2026) & (K Units)

Table 115. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity by Country (2027-2032) & (K Units)

Table 116. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2021-2026) & (USD Million)

Table 117. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Country (2027-2032) & (USD Million)

Table 118. Single-Photon Avalanche Photodiode (SPAD) Raw Material

Table 119. Key Manufacturers of Single-Photon Avalanche Photodiode (SPAD) Raw Materials

Table 120. Single-Photon Avalanche Photodiode (SPAD) Typical Distributors

Table 121. Single-Photon Avalanche Photodiode (SPAD) Typical Customers

## List Of Figures

### LIST OF FIGURES

- Figure 1. Single-Photon Avalanche Photodiode (SPAD) Picture
- Figure 2. Global Single-Photon Avalanche Photodiode (SPAD) Revenue by Type, (USD Million), 2021 & 2025 & 2032
- Figure 3. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Type in 2025
- Figure 4. Visible Light Examples
- Figure 5. Near-Infrared Examples
- Figure 6. Short-Wave Infrared Examples
- Figure 7. Mid-Long-Wave Infrared Examples
- Figure 8. Global Single-Photon Avalanche Photodiode (SPAD) Revenue by Material, (USD Million), 2021 & 2025 & 2032
- Figure 9. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Material in 2025
- Figure 10. Si-SPAD Examples
- Figure 11. InGaAs/InP-SPAD Examples
- Figure 12. HgCdTe / Ge / Ge-on-Si Examples
- Figure 13. Global Single-Photon Avalanche Photodiode (SPAD) Revenue by Operating Voltage, (USD Million), 2021 & 2025 & 2032
- Figure 14. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Operating Voltage in 2025
- Figure 15. Below 50V Examples
- Figure 16. Above 50V Examples
- Figure 17. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value by Application, (USD Million), 2021 & 2025 & 2032
- Figure 18. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Application in 2025
- Figure 19. Telecommunications & Consumer Electronics Examples
- Figure 20. Automotive Examples
- Figure 21. Medical Examples
- Figure 22. Industrial Examples
- Figure 23. Other Examples
- Figure 24. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value, (USD Million): 2021 & 2025 & 2032
- Figure 25. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value and Forecast (2021-2032) & (USD Million)

Figure 26. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity (2021-2032) & (K Units)

Figure 27. Global Single-Photon Avalanche Photodiode (SPAD) Price (2021-2032) & (US\$/Unit)

Figure 28. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Manufacturer in 2025

Figure 29. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Manufacturer in 2025

Figure 30. Producer Shipments of Single-Photon Avalanche Photodiode (SPAD) by Manufacturer Sales (\$MM) and Market Share (%): 2025

Figure 31. Top 3 Single-Photon Avalanche Photodiode (SPAD) Manufacturer (Revenue) Market Share in 2025

Figure 32. Top 6 Single-Photon Avalanche Photodiode (SPAD) Manufacturer (Revenue) Market Share in 2025

Figure 33. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Region (2021-2032)

Figure 34. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Region (2021-2032)

Figure 35. North America Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 36. Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 37. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 38. South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 39. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 40. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 41. Global Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Type (2021-2032)

Figure 42. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by Type (2021-2032) & (US\$/Unit)

Figure 43. Global Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 44. Global Single-Photon Avalanche Photodiode (SPAD) Revenue Market Share by Application (2021-2032)

Figure 45. Global Single-Photon Avalanche Photodiode (SPAD) Average Price by

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

Figure 46. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 47. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 48. North America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Country (2021-2032)

Figure 49. North America Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Country (2021-2032)

Figure 50. United States Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 51. Canada Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 52. Mexico Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 53. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 54. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 55. Europe Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Country (2021-2032)

Figure 56. Europe Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Country (2021-2032)

Figure 57. Germany Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 58. France Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 59. United Kingdom Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 60. Russia Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 61. Italy Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 62. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 63. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 64. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Region (2021-2032)

Figure 65. Asia-Pacific Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Region (2021-2032)

Figure 66. China Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 67. Japan Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 68. South Korea Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 69. India Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 70. Southeast Asia Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 71. Australia Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 72. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 73. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 74. South America Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Country (2021-2032)

Figure 75. South America Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Country (2021-2032)

Figure 76. Brazil Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 77. Argentina Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 78. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Type (2021-2032)

Figure 79. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Application (2021-2032)

Figure 80. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Sales Quantity Market Share by Country (2021-2032)

Figure 81. Middle East & Africa Single-Photon Avalanche Photodiode (SPAD) Consumption Value Market Share by Country (2021-2032)

Figure 82. Turkey Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 83. Egypt Single-Photon Avalanche Photodiode (SPAD) Consumption Value (2021-2032) & (USD Million)

Figure 84. Saudi Arabia Single-Photon Avalanche Photodiode (SPAD) Consumption

Value (2021-2032) & (USD Million)

Figure 85. South Africa Single-Photon Avalanche Photodiode (SPAD) Consumption

Value (2021-2032) & (USD Million)

Figure 86. Single-Photon Avalanche Photodiode (SPAD) Market Drivers

Figure 87. Single-Photon Avalanche Photodiode (SPAD) Market Restraints

Figure 88. Single-Photon Avalanche Photodiode (SPAD) Market Trends

Figure 89. Porters Five Forces Analysis

Figure 90. Manufacturing Cost Structure Analysis of Single-Photon Avalanche Photodiode (SPAD) in 2025

Figure 91. Manufacturing Process Analysis of Single-Photon Avalanche Photodiode (SPAD)

Figure 92. Single-Photon Avalanche Photodiode (SPAD) Industrial Chain

Figure 93. Sales Channel: Direct to End-User vs Distributors

Figure 94. Direct Channel Pros & Cons

Figure 95. Indirect Channel Pros & Cons

Figure 96. Methodology

Figure 97. Research Process and Data Source

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