

Silicon Photomultiplier (SiPM) Market Forecasts to 2034 – Global Analysis By Device Type (Analog Silicon Photomultipliers, Digital Silicon Photomultipliers, Near-Ultraviolet (NUV) SiPMs, RGB-Sensitive SiPMs, and Custom SiPM Arrays), Cell Size, Spectral Range, Array Configuration, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Silicon Photomultiplier (SiPM) Market is accounted for \$0.4 billion in 2026 and is expected to reach \$1.2 billion by 2034, growing at a CAGR of 15.1% during the forecast period. Silicon photomultipliers refer to advanced solid-state photodetectors consisting of arrays of single-photon avalanche diodes fabricated on silicon substrates, offering high sensitivity, fast response, and excellent timing resolution for low-light detection across various applications. These devices encompass analog SiPMs, digital SiPMs, near-ultraviolet SiPMs, RGB-sensitive SiPMs, and custom SiPM arrays across various cell sizes from below 25 μm to above 75 μm , supporting spectral ranges including ultraviolet, visible light, and near infrared with array configurations including single-channel, multi-channel arrays, monolithic arrays, and modular arrays.

Market Dynamics:

Driver:

Growing demand for high-sensitivity photodetection in medical and automotive applications

The increasing demand for high-sensitivity photodetection in medical imaging and automotive applications serves as a primary catalyst for the silicon photomultiplier market. SiPMs offer superior sensitivity, timing resolution, and photon detection efficiency compared to traditional photomultiplier tubes, making them ideal for positron emission tomography and other medical imaging applications. The growing adoption of LiDAR in autonomous vehicles and ADAS systems drives demand for SiPMs with excellent timing resolution and sensitivity. The ability to operate at lower bias voltages with improved robustness supports widespread adoption. As medical imaging and automotive sensing applications continue to expand, the demand for SiPM solutions continues to grow.

Restraint:

Higher costs and manufacturing complexity

The silicon photomultiplier market faces significant challenges from higher costs and manufacturing complexity compared to conventional photodetectors. SiPM fabrication requires specialized semiconductor processing, advanced packaging, and careful calibration to achieve consistent performance. The complexity of producing high-quality single-photon avalanche diode arrays increases manufacturing costs. Additionally, achieving uniform performance across large arrays presents manufacturing challenges. These cost and complexity factors can limit SiPM adoption, particularly in cost-sensitive applications where conventional photodetectors provide sufficient performance.

Opportunity:

Growth of LiDAR and quantum sensing applications

The rapid expansion of LiDAR systems and emerging quantum sensing applications presents significant opportunities for silicon photomultiplier providers. LiDAR systems for autonomous vehicles require high-sensitivity, fast-response photodetectors that SiPMs provide for accurate distance measurement. Quantum sensing applications including quantum computing and quantum communication require single-photon detection capabilities that SiPMs enable. The development of advanced SiPM technologies with improved performance characteristics supports emerging applications. As these application segments continue to grow, the opportunities for SiPM innovation continue to expand.

Threat:

Competition from photomultiplier tubes and other solid-state detectors

The silicon photomultiplier market faces threats from competition from photomultiplier tubes and other solid-state detector technologies that could limit adoption in certain applications. PMTs continue to offer advantages in some applications including large-area detection and specific spectral ranges. Competing solid-state detector technologies including avalanche photodiodes and SPAD arrays provide alternatives for some applications. Additionally, advances in detector technologies could provide competitive advantages in specific applications. These competitive pressures require SiPM providers to demonstrate advantages in sensitivity, timing, and system integration.

Covid-19 Impact:

The COVID-19 pandemic significantly impacted the silicon photomultiplier market by accelerating demand for medical imaging equipment and healthcare applications while disrupting manufacturing operations and supply chains. The pandemic increased demand for PET scanners and medical imaging equipment for diagnostic purposes, driving SiPM adoption. Healthcare applications including radiation detection and diagnostic imaging created additional demand. Supply chain disruptions affected manufacturing capacity and component availability. As healthcare demand remained strong and medical technology investment continued, the focus on SiPM technology for medical imaging applications intensified.

The analog silicon photomultipliers segment is expected to be the largest during the forecast period

The analog silicon photomultipliers segment is expected to account for the largest market share during the forecast period, driven by their widespread adoption across medical imaging, LiDAR, and radiation detection applications where high sensitivity, fast response, and excellent timing resolution are critical requirements. Analog SiPMs provide the performance characteristics essential for demanding detection applications. The established manufacturing infrastructure and proven reliability support continued adoption. As medical imaging and LiDAR applications continue to expand, analog SiPMs maintain the largest device type segment in the SiPM market.

The digital silicon photomultipliers segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the digital silicon photomultipliers segment is predicted to witness the highest growth rate, driven by their advantages in noise reduction, photon counting, and improved signal-to-noise ratio for demanding applications including quantum sensing, advanced medical imaging, and high-energy physics experiments. Digital SiPMs integrate processing capabilities for enhanced performance. The growing requirements for precise photon counting and timing support digital SiPM adoption. As performance requirements become more demanding, the demand for digital SiPM technology continues to accelerate.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share, driven by the concentration of consumer electronics manufacturing, automotive production, and semiconductor fabrication capacity across countries like China, Japan, South Korea, Taiwan, and Malaysia. The region's dominance in automotive and electronics manufacturing supports SiPM demand for LiDAR and sensing applications. Major automotive and electronics manufacturers in Asia Pacific are significant users of SiPM technology. Additionally, the presence of semiconductor manufacturing contributes to the region's largest market share.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is also anticipated to exhibit the highest CAGR, reinforcing its market leadership through continued automotive production and healthcare technology expansion. The growth is fueled by increasing LiDAR adoption in autonomous vehicles, medical imaging equipment production, and growing industrial automation across Asia Pacific countries. China's automotive leadership, Japan's electronics expertise, and South Korea's technology manufacturing support regional growth. The rapid expansion of LiDAR deployment and medical technology production across the region accelerates SiPM adoption at the fastest pace.

Key players in the market

Some of the key players in Silicon Photomultiplier (SiPM) Market include Hamamatsu Photonics K.K., onsemi, Broadcom Inc., TELEDYNE Technologies Incorporated, Excelitas Technologies Corp., KETEK GmbH, AdvanSiD S.r.l., LYNRED, Panasonic Holdings Corporation, Toshiba Corporation, STMicroelectronics N.V., Analog Devices Inc., Scintacor Ltd., Cremat Inc., and Photonique SA.

Key Developments:

In March 2025, Hamamatsu Photonics announced its next-generation SiPM platform featuring improved photon detection efficiency and timing resolution for medical imaging and LiDAR applications. The platform enables enhanced performance for demanding detection applications.

In February 2025, onsemi introduced a new family of SiPM devices for automotive LiDAR and industrial sensing applications, delivering improved sensitivity and robustness for challenging environments. The devices support growing demand for high-performance sensing solutions.

Device Types Covered:

Analog Silicon Photomultipliers

Digital Silicon Photomultipliers

Near-Ultraviolet (NUV) SiPMs

RGB-Sensitive SiPMs

Custom SiPM Arrays

Cell Sizes Covered:

Below 25 μm

25–50 μm

50–75 μm

Above 75 μm

Spectral Ranges Covered:

Ultraviolet (UV)

Visible Light

Near Infrared (NIR)

Array Configurations Covered:

Single-Channel SiPM

Multi-Channel SiPM Arrays

Monolithic Arrays

Modular Arrays

Applications Covered:

Medical Imaging

LiDAR

High-Energy & Nuclear Physics

Radiation Detection

Industrial Automation & Machine Vision

Optical Communication

End Users Covered:

Healthcare & Medical Devices

Automotive

Industrial Manufacturing

Aerospace & Defense

Research Institutes & Universities

Telecommunications

Nuclear Energy & Security

Consumer Electronics

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market Snapshot and Key Highlights
- 1.2 Growth Drivers, Challenges, and Opportunities
- 1.3 Competitive Landscape Overview
- 1.4 Strategic Insights and Recommendations

2 RESEARCH FRAMEWORK

- 2.1 Study Objectives and Scope
- 2.2 Stakeholder Analysis
- 2.3 Research Assumptions and Limitations
- 2.4 Research Methodology
 - 2.4.1 Data Collection (Primary and Secondary)
 - 2.4.2 Data Modeling and Estimation Techniques
 - 2.4.3 Data Validation and Triangulation
 - 2.4.4 Analytical and Forecasting Approach

3 MARKET DYNAMICS AND TREND ANALYSIS

- 3.1 Market Definition and Structure
- 3.2 Key Market Drivers
- 3.3 Market Restraints and Challenges
- 3.4 Growth Opportunities and Investment Hotspots
- 3.5 Industry Threats and Risk Assessment
- 3.6 Technology and Innovation Landscape
- 3.7 Emerging and High-Growth Markets
- 3.8 Regulatory and Policy Environment
- 3.9 Impact of COVID-19 and Recovery Outlook

4 COMPETITIVE AND STRATEGIC ASSESSMENT

- 4.1 Porter's Five Forces Analysis
 - 4.1.1 Supplier Bargaining Power
 - 4.1.2 Buyer Bargaining Power
 - 4.1.3 Threat of Substitutes
 - 4.1.4 Threat of New Entrants

- 4.1.5 Competitive Rivalry
- 4.2 Market Share Analysis of Key Players
- 4.3 Product Benchmarking and Performance Comparison

5 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY DEVICE TYPE

- 5.1 Analog Silicon Photomultipliers
- 5.2 Digital Silicon Photomultipliers
- 5.3 Near-Ultraviolet (NUV) SiPMs
- 5.4 RGB-Sensitive SiPMs
- 5.5 Custom SiPM Arrays

6 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY CELL SIZE

- 6.1 Below 25 μm
- 6.2 25–50 μm
- 6.3 50–75 μm
- 6.4 Above 75 μm

7 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY SPECTRAL RANGE

- 7.1 Ultraviolet (UV)
- 7.2 Visible Light
- 7.3 Near Infrared (NIR)

8 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY ARRAY CONFIGURATION

- 8.1 Single-Channel SiPM
- 8.2 Multi-Channel SiPM Arrays
- 8.3 Monolithic Arrays
- 8.4 Modular Arrays

9 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY APPLICATION

- 9.1 Medical Imaging
- 9.2 LiDAR
- 9.3 High-Energy & Nuclear Physics
- 9.4 Radiation Detection

9.5 Industrial Automation & Machine Vision

9.6 Optical Communication

10 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY END USER

10.1 Healthcare & Medical Devices

10.2 Automotive

10.3 Industrial Manufacturing

10.4 Aerospace & Defense

10.5 Research Institutes & Universities

10.6 Telecommunications

10.7 Nuclear Energy & Security

10.8 Consumer Electronics

11 GLOBAL SILICON PHOTOMULTIPLIER (SIPM) MARKET, BY GEOGRAPHY

11.1 North America

11.1.1 United States

11.1.2 Canada

11.1.3 Mexico

11.2 Europe

11.2.1 United Kingdom

11.2.2 Germany

11.2.3 France

11.2.4 Italy

11.2.5 Spain

11.2.6 Netherlands

11.2.7 Belgium

11.2.8 Sweden

11.2.9 Switzerland

11.2.10 Poland

11.2.11 Rest of Europe

11.3 Asia Pacific

11.3.1 China

11.3.2 Japan

11.3.3 India

11.3.4 South Korea

11.3.5 Australia

11.3.6 Indonesia

- 11.3.7 Thailand
- 11.3.8 Malaysia
- 11.3.9 Singapore
- 11.3.10 Vietnam
- 11.3.11 Rest of Asia Pacific
- 11.4 South America
 - 11.4.1 Brazil
 - 11.4.2 Argentina
 - 11.4.3 Colombia
 - 11.4.4 Chile
 - 11.4.5 Peru
 - 11.4.6 Rest of South America
- 11.5 Rest of the World (RoW)
 - 11.5.1 Middle East
 - 11.5.1.1 Saudi Arabia
 - 11.5.1.2 United Arab Emirates
 - 11.5.1.3 Qatar
 - 11.5.1.4 Israel
 - 11.5.1.5 Rest of Middle East
 - 11.5.2 Africa
 - 11.5.2.1 South Africa
 - 11.5.2.2 Egypt
 - 11.5.2.3 Morocco
 - 11.5.2.4 Rest of Africa

12 STRATEGIC MARKET INTELLIGENCE

- 12.1 Industry Value Network and Supply Chain Assessment
- 12.2 White-Space and Opportunity Mapping
- 12.3 Product Evolution and Market Life Cycle Analysis
- 12.4 Channel, Distributor, and Go-to-Market Assessment

13 INDUSTRY DEVELOPMENTS AND STRATEGIC INITIATIVES

- 13.1 Mergers and Acquisitions
- 13.2 Partnerships, Alliances, and Joint Ventures
- 13.3 New Product Launches and Certifications
- 13.4 Capacity Expansion and Investments
- 13.5 Other Strategic Initiatives

14 COMPANY PROFILES

- 14.1 Hamamatsu Photonics K.K.
- 14.2 onsemi
- 14.3 Broadcom Inc.
- 14.4 TELEDYNE Technologies Incorporated
- 14.5 Excelitas Technologies Corp.
- 14.6 KETEK GmbH
- 14.7 AdvanSiD S.r.l.
- 14.8 LYNRED
- 14.9 Panasonic Holdings Corporation
- 14.10 Toshiba Corporation
- 14.11 STMicroelectronics N.V.
- 14.12 Analog Devices, Inc.
- 14.13 Scintacor Ltd.
- 14.14 Cremat, Inc.
- 14.15 Photonique SA

List Of Tables

LIST OF TABLES

Table 1 Global Silicon Photomultiplier (SiPM) Market Outlook, By Region (2023-2034) (\$MN)

Table 2 Global Silicon Photomultiplier (SiPM) Market Outlook, By Device Type (2023-2034) (\$MN)

Table 3 Global Silicon Photomultiplier (SiPM) Market Outlook, By Analog Silicon Photomultipliers (2023-2034) (\$MN)

Table 4 Global Silicon Photomultiplier (SiPM) Market Outlook, By Digital Silicon Photomultipliers (2023-2034) (\$MN)

Table 5 Global Silicon Photomultiplier (SiPM) Market Outlook, By Near-Ultraviolet (NUV) SiPMs (2023-2034) (\$MN)

Table 6 Global Silicon Photomultiplier (SiPM) Market Outlook, By RGB-Sensitive SiPMs (2023-2034) (\$MN)

Table 7 Global Silicon Photomultiplier (SiPM) Market Outlook, By Custom SiPM Arrays (2023-2034) (\$MN)

Table 8 Global Silicon Photomultiplier (SiPM) Market Outlook, By Cell Size (2023-2034) (\$MN)

Table 9 Global Silicon Photomultiplier (SiPM) Market Outlook, By Below 25 μm (2023-2034) (\$MN)

Table 10 Global Silicon Photomultiplier (SiPM) Market Outlook, By 25–50 μm (2023-2034) (\$MN)

Table 11 Global Silicon Photomultiplier (SiPM) Market Outlook, By 50–75 μm (2023-2034) (\$MN)

Table 12 Global Silicon Photomultiplier (SiPM) Market Outlook, By Above 75 μm (2023-2034) (\$MN)

Table 13 Global Silicon Photomultiplier (SiPM) Market Outlook, By Spectral Range (2023-2034) (\$MN)

Table 14 Global Silicon Photomultiplier (SiPM) Market Outlook, By Ultraviolet (UV) (2023-2034) (\$MN)

Table 15 Global Silicon Photomultiplier (SiPM) Market Outlook, By Visible Light (2023-2034) (\$MN)

Table 16 Global Silicon Photomultiplier (SiPM) Market Outlook, By Near Infrared (NIR) (2023-2034) (\$MN)

Table 17 Global Silicon Photomultiplier (SiPM) Market Outlook, By Array Configuration (2023-2034) (\$MN)

Table 18 Global Silicon Photomultiplier (SiPM) Market Outlook, By Single-Channel

SiPM (2023-2034) (\$MN)

Table 19 Global Silicon Photomultiplier (SiPM) Market Outlook, By Multi-Channel SiPM Arrays (2023-2034) (\$MN)

Table 20 Global Silicon Photomultiplier (SiPM) Market Outlook, By Monolithic Arrays (2023-2034) (\$MN)

Table 21 Global Silicon Photomultiplier (SiPM) Market Outlook, By Modular Arrays (2023-2034) (\$MN)

Table 22 Global Silicon Photomultiplier (SiPM) Market Outlook, By Application (2023-2034) (\$MN)

Table 23 Global Silicon Photomultiplier (SiPM) Market Outlook, By Medical Imaging (2023-2034) (\$MN)

Table 24 Global Silicon Photomultiplier (SiPM) Market Outlook, By LiDAR (2023-2034) (\$MN)

Table 25 Global Silicon Photomultiplier (SiPM) Market Outlook, By High-Energy & Nuclear Physics (2023-2034) (\$MN)

Table 26 Global Silicon Photomultiplier (SiPM) Market Outlook, By Radiation Detection (2023-2034) (\$MN)

Table 27 Global Silicon Photomultiplier (SiPM) Market Outlook, By Industrial Automation & Machine Vision (2023-2034) (\$MN)

Table 28 Global Silicon Photomultiplier (SiPM) Market Outlook, By Optical Communication (2023-2034) (\$MN)

Table 29 Global Silicon Photomultiplier (SiPM) Market Outlook, By End User (2023-2034) (\$MN)

Table 30 Global Silicon Photomultiplier (SiPM) Market Outlook, By Healthcare & Medical Devices (2023-2034) (\$MN)

Table 31 Global Silicon Photomultiplier (SiPM) Market Outlook, By Automotive (2023-2034) (\$MN)

Table 32 Global Silicon Photomultiplier (SiPM) Market Outlook, By Industrial Manufacturing (2023-2034) (\$MN)

Table 33 Global Silicon Photomultiplier (SiPM) Market Outlook, By Aerospace & Defense (2023-2034) (\$MN)

Table 34 Global Silicon Photomultiplier (SiPM) Market Outlook, By Research Institutes & Universities (2023-2034) (\$MN)

Table 35 Global Silicon Photomultiplier (SiPM) Market Outlook, By Telecommunications (2023-2034) (\$MN)

Table 36 Global Silicon Photomultiplier (SiPM) Market Outlook, By Nuclear Energy & Security (2023-2034) (\$MN)

Table 37 Global Silicon Photomultiplier (SiPM) Market Outlook, By Consumer Electronics (2023-2034) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) are also represented in the same manner as above.

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