Time-of-Flight (TOF) Sensor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The Time-of-Flight Sensor Market size is estimated at USD 6.68 billion in 2025, and is expected to reach USD 17.38 billion by 2030, at a CAGR of 21.07% during the forecast period (2025-2030).

Key Highlights
- The market under study is driven by the rising demand for smartphones equipped with 3D cameras. One of the smartphones' most notable and popular features is their toF cameras. Additionally, it is noted that more people worldwide are subscribing to mobile networks for smartphones. According to Ericsson, smartphone mobile network subscriptions worldwide reached approximately 6.6 billion in 2022 and are expected to surpass 7.8 billion by 2028. The nations with the most smartphone mobile network subscriptions are China, India, and the United States.
- This market's expansion is primarily fueled by rising automotive industry demand for ToF sensors, rising 3D camera use in smartphones, and rising smartphone usage. The market for ToF sensors contains a lot of room to develop because of the expanding use of Industry 4.0 and 3D machine vision systems across various industries.
- As per Edison Investment Research and OICA, forward-facing automotive camera unit sales will increase in Western Europe from 2016 to 2025. By 2025, some 15.5 million forward-facing automotive camera systems are expected to be sold in Western Europe, which also includes 3D cameras altogether.
- Additionally, 3D imaging and scanning will rule the market for ToF sensors throughout the expected timeframe. An object can be turned into a 3D model using 3D scanning technology. The specific area and dimensions of the object are collected, and this mapping data can be used for designing using depth sensing. Future years will see a rise in the adoption of 3D scanning technology because it is easy to use. Time-of-flight technology is an active type of 3D image and scanning technology. Structured light and stereo vision, the other two 3D imaging techniques, are slower, less trustworthy, and use more energy than ToF. ToF technology is anticipated to experience an increase in demand for 3D imaging and scanning applications because of its

accessibility.
- TOF technology includes the benefits of long working distances, wide application range, and high distance accuracy. However, there are many disadvantages. For instance, the current mainstream ToF sensor on the mobile phone includes a relatively low resolution (180*240, 240*320, 240*480, etc.), so the accuracy and X/Y resolution in the close range may be relatively low.
- The rising use of cameras in AR and VR may open up new opportunities for the market in post-COVID-19 recovery. Sony Corporation introduced the IMX500, which includes both processing power and memory. This image sensor performs machine learning (ML) and aids in powering computer vision processes without using any external hardware. 3D ToF image sensors could be used in smartphones to provide 3D awareness of the environment for AR/VR applications.

Time-of-flight (TOF) Sensor Market Trends

Consumer Electronics to be the Largest End User

- The demand for Time-of-Flight sensors is increasing owing to their applications in smartphones, tablets, household robots, digital cameras, smart speakers, and PC projectors. However, devices concerning the gaming and entertainment industry are excluded from the segment. A ToF camera sensor measures the distance and volume and offers object scanning, indoor navigation, obstacle avoidance, gesture recognition, object tracking, and reactive altimeters.
- In smartphones, ToF sensors are used for various purposes, including biometric security (particularly facial recognition, cameras, movement tracking, and others. ToF sensors make the smartphone camera superior. It is used in mobile devices for photography features such as blurring effects and auto-focus and enables the camera to capture objects, background, and movement of human body parts. Moreover, it also provides an eye-catching special effect, particularly in fast-action scenes.
- According to Ericsson, worldwide smartphone subscription is expected to reach 7,516.0 million units by 2026. Thus, the increasing adoption of high-end smartphones led smartphone manufacturers to introduce advanced features to stay ahead of the competitors. It contributed to the TOF sensors market growth and is expected to do so over the study period. In line with this, in August 2022, Samsung announced it is working on its version of the 3D ToF sensor, which may debut with the Galaxy S21 series. The sensor in the smartphone will bring better face recognition and depth sensing capabilities.
- Several leading manufacturers operating in the market studied are focusing on developing new products to meet the growing demand. For instance, in June 2022, STMicroelectronics NV announced its newest FlightSense ToF ranging sensor for smartphone camera management and virtual/augmented reality. It features innovative metasurface lens technology and an energy-efficient architecture that reduces battery drain, extends the camera's autofocus range, and improves scene understanding.
- Furthermore, the rapidly growing smart home concept increased the demand for household/service robots in developed countries. ToF sensors in service robots detect motion to determine the presence of objects and people. The sensor can also work in any lighting conditions, including full sunlight, and provides accurate range measurements independent of the target's color and optical transparency. Moreover, the changing lifestyle, growing urbanization, and increasing penetration of smart consumer products created a favorable scenario for the studied market growth during the forecast period.

Asia-Pacific is Expected to Hold Significant Market Share

- China is the world's largest producer and exporter of consumer electronics, providing the sector with numerous potential for expansion. Additionally, the region's electronics manufacturing sector continued expanding steadily. According to research by the China Academy of Information and Communications Technology, major electronics manufacturers' added value increased 12.7% year over year between January and February 2022, as opposed to the country's total industrial sector's 7.5% rise.
- The consumer electronics market in China is expanding rapidly, reflected in the leading electronics companies' rising added

value and rising demand for electronics in the nation. By enabling capabilities like facial recognition, gesture control, and depth sensing, ToF sensors significantly improve the usability and functionality of these gadgets. The need for ToF sensors is projected to rise as the consumer electronics market grows.
- Japan includes a robust consumer electronics market. ToF sensors are used in virtual reality (VR) headsets, gaming consoles, smartphones, and tablets. Market expansion was likely encouraged by consumer demand for these products and their integration with ToF sensors.
- In India, the ToF sensors market is fueled by the rising demand for premium and flagship smartphones and the rising demand for enhanced camera features, AR/VR apps, gesture recognition, face unlock, gaming, and AI capabilities. As customers place greater value on these functionalities, manufacturers of smartphones are anticipated to use ToF sensors more frequently. It will increase the size of the ToF sensors market in India.
- The other countries considered in the Asia Pacific region in this study are Australia, and all Southeast Asian Countries, among others. These countries also include a high potential for gaining a considerable market share. Growing demand for high-end smartphones and other consumer electronics products from countries such as the Republic of Korea and Singapore encourages many companies to set up production establishments in the Asia-Pacific region. The abundant availability of raw materials in countries such as Taiwan, the low establishment of facilities, and labor costs also helped the companies launch their regional production centers.

Time-of-flight (TOF) Sensor Industry Overview

The Time-of-Flight (TOF) Sensor Market is highly fragmented. The brand identity associated with established companies, like Sony Corporation and STMicroelectronics NV, includes a major influence in this market. Strong brands are synonymous with good performance, so long-standing players are expected for an upper hand. Considering their market penetration and the ability to invest in new technologies, the competitive rivalry is expected to continue to be high. Moreover, vendors are investing significantly in the market due to increasing competition.

- June 2023: Texas Instruments Inc. announced plans to expand its internal manufacturing footprint in Malaysia with two new assembly and test factories in Kuala Lumpur and Melaka. Through this expansion, the company aims to support its plan to bring 90% of its internal assembly and test operations by 2030 and include greater supply control.
- January 2023: Hydra3D+, a new Time-of-Flight (ToF) CMOS image sensor with 832 x 600 pixel resolution designed for flexible 3D detection and measurement, is released by Teledyne e2v, a division of Teledyne Technologies. Due to an inventive on-chip multi-system management function, the sensor can operate alongside numerous active systems without interference, resulting in inaccurate data.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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