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STMicroelectronics unveils new compact direct Time-of-Flight 3D LiDAR module bringing high-resolution spatial awareness to compact edge AI systems with industry-leading resolution and performance

- *VL53L9 is the first direct Time-of-Flight (dToF) 3D LiDAR all-in-one module in ST's portfolio, offering a resolution of 2.3K zones, wide field of view, on-chip processing, 100 frames per second, and sensing range from 5 centimeters to 9 meters.*
- *Designed to meet the evolving needs of customers and partners across diverse industries, including robotics, industrial automation, smart buildings, AR/VR, and healthcare.*

Geneva, June 22, 2026 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, today announced the launch of the VL53L9, a compact direct Time-of-Flight 3D LiDAR all-in-one module that sets a new benchmark in high-resolution sensing. The VL53L9 combines state-of-the-art features in a compact and cost-effective package, delivering AI-ready output data for low-compute edge AI systems on small microcontrollers (MCUs) and high-performance sensing across a wide range of applications across robotics, industrial automation, smart buildings, AR/VR, and healthcare.

"VL53L9 demonstrates how far Time-of-Flight sensing has evolved, combining high-resolution depth data, up to 100 frames per second, and a fully integrated architecture in a single compact module. By simplifying integration and reducing system complexity, we enable customers to accelerate the development of applications such as robotics, smart infrastructure, and healthcare monitoring," said **Alexandre Balmefrezol, Executive Vice President and General Manager of the Imaging Sub-Group at STMicroelectronics**. *"This launch reflects our strategy to move beyond standalone sensors and deliver integrated sensing systems that support real-world edge AI."*

"3D sensing demand accelerates across robotics, industrial automation, XR, and intelligent consumer devices. Time-of-Flight technology is expanding beyond smartphones into applications requiring compact, affordable, and precise depth perception, from navigation and people monitoring to gesture recognition and safety. Higher resolution multizone dToF modules are now emerging as key enablers for this next wave of 3D sensing adoption(1)," said **Anas Chalak, Market & Technology Analyst at Yole Group.**

ST FlightSense™ VL53L9 is designed for multiple industry use cases:

- **Robotics**: enhanced small object detection, SLAM (simultaneous localization and mapping) and obstacle avoidance for autonomous navigation.
- **Industrial automation**: accurate volume measurement in tanks and bins, improving operational efficiency and inventory management.
- **Smart buildings and homes**: reliable human presence detection and people counting while preserving user privacy.
- **AR/VR and consumer electronics**: advanced gesture recognition, body tracking and finger skeleton for immersive user experiences.
- **Healthcare**: fall detection and monitoring solutions for eldercare and patient safety.

Technical Information

Enhancing 3D sensing with precision and efficiency

The VL53L9 offers an unprecedented 2,268 resolution zones (54x42) with a wide 54°x42° field of view, enabling detailed 3D depth mapping and precise detection of small objects, contours, and edges. Leveraging ST's proprietary stacked BSI SPAD sensor technology and innovative metasurface optical elements (MOE), the module delivers fast and accurate ranging from less than 5 cm up to 9 meters with up to 1% accuracy and a frame rate of 100 frames per second.

All-in-one sensing data for edge AI and easy integration

The VL53L9's dual-scan flood illumination replaces traditional dot scanning, reducing motion artifacts, eliminating dead zones, improving small-object detection, and capturing complementary 2D infrared and 3D depth images. Compared to competition, this greatly simplifies post-processing and enables a broad range of edge AI use cases to run efficiently on small MCUs with low compute requirements. The all-in-one module further integrates on-chip dToF processing, a dedicated power management IC, and is fully calibration-free, simplifying integration and reducing system cost and complexity.

Compact form factor

Measuring just 12.8 mm x 6.1 mm x 4.6 mm, the VL53L9 is a reflowable, single-component module compatible with a wide range of cover glass materials. It supports dual power supply operation (1.2 V and 3.3 V) and outputs data via MIPI or I3C interfaces, ensuring compatibility with diverse CPU architectures. The module is certified as Class 1 laser safe, providing reliable and secure operation for end users.

Availability

ST FlightSense™ VL53L9 in mass production in early July 2026 with samples and volume shipments available to customers globally.

For more information, visit the VL53L9 product page: https://www.st.com/vl53l9cx

(1) 2025 – 2030 period; Source: 3D Imaging & Sensing 2025 report, Yole Group

About STMicroelectronics

At ST, we are 49,000 creators and makers of semiconductor technologies mastering the semiconductor supply chain with state-of-the-art manufacturing facilities. An integrated device manufacturer, we work with more than 200,000 customers and thousands of partners to design and build products, solutions, and ecosystems that address their challenges and opportunities, and the need to support a more sustainable world. Our technologies enable smarter mobility, more efficient power and energy management, and the wide-scale deployment of cloud-connected autonomous things. We are on track to be carbon neutral in all direct and indirect emissions (scopes 1 and 2), product transportation, business travel, and employee commuting emissions (our scope 3 focus), and to achieve our 100% renewable electricity sourcing goal by the end of 2027. Further information can be found at www.st.com.

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