



Ambarella, Lumentum and ON Semiconductor Collaborate on AI Processing Based 3D Sensing for Next-gen AIoT Devices

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New joint reference designs offer industry-first approaches for biometric access control, 3D electronic locks and intelligent sensing across verticals

SANTA CLARA, Calif., May 26, 2021 (GLOBE NEWSWIRE) -- Ambarella, Inc. (NASDAQ: AMBA), an AI vision silicon company, Lumentum (NASDAQ: LITE), a market-leading designer and manufacturer of innovative optical and photonic products, and ON Semiconductor® (NASDAQ: ON), a leading provider of CMOS image sensor solutions, today announced two new joint reference designs that accelerate AIoT device deployment across verticals, building on the companies' [previous joint solution for contactless access systems](#). By combining the data from Lumentum's high-performance VCSEL array illuminators and an ON Semiconductor image sensor using Ambarella's AI SoC, higher levels of accuracy and more intelligent decision-making can be achieved in next-generation AIoT devices for biometric access control, 3D electronic locks and other intelligent sensing applications.

Originally intended for biometric access control and electronic locks, these new reference designs can also address the needs of smart cities, smart buildings, smart homes and intelligent healthcare. Additionally, the high level of integration provided by these joint solutions significantly lowers system power consumption and thermal design requirements while enabling much smaller product form factors.

"Ambarella's vision is to combine AI processing with 3D and vision sensing to create an ambient intelligent future," said Fermi Wang, President and CEO of Ambarella. "This collaboration with Lumentum and ON Semiconductor will further advance the convergence of AI and IoT to enable a new generation of access control systems, while inspiring novel categories of ambient sensing products—all powered by the fusion of sensors using AI vision processors that interact intelligently and unobtrusively with people to address their ever-evolving needs."

"Our new joint solutions will greatly increase the accuracy of AIoT devices across application verticals—starting with biometric access control and electronic locks—enabling them to recognize people and predict their needs, rather than requiring a direct human interface," said Téa Williams, Senior Vice President and General Manager, 3D Sensing of Lumentum. "Many of these applications will take advantage of 3D sensing to inject a new dimension of data input for improved decision-making. As an example, using higher resolution VCSEL-based spot illumination enables longer sensing ranges and higher-accuracy facial recognition. Lumentum's industry-leading and high-performance VCSEL arrays with zero field failures, used across these joint solutions, are driving new applications and helping realize the dream of AIoT devices with 3D sensing capabilities."

"Image sensors are the eyes for intelligent sensing devices. Their ability to see farther with more detail provides significantly more information for the AI processor's decision-making in AIoT devices," said Gianluca Colli, Vice President and General Manager, Industrial and Consumer Sensor Division (ICSD) group at ON Semiconductor. "Our industry leading RGB-IR sensor technology, combined with the advanced ISP capabilities of Ambarella's AI vision SoCs, can bring both visible and IR images into devices simultaneously. For this second generation of our joint solutions, we leveraged customer feedback to quadruple the resolution of our RGB-IR image sensors to 4K (8MP)."

The three companies' new joint AIoT solutions consist of two reference designs and additional 3D sensing development kits, each uniquely configured to address application-specific demands for the combination of AI processing, 3D depth sensing and vision sensing:

- Targeted at next-generation biometric access control readers, the **Vision+ reference design** is the AIoT industry's first 4K solution to perform single-camera, 940nm structured-light sensing based on RGB-IR technology. It is also the first to leverage a single-chip solution for depth processing, AI processing and video processing. Based on the Ambarella CV22 CVflow® AI vision processor, it includes single-camera structured-light sensing powered by Lumentum's VCSEL technology, featuring a range of 2 meters, and a 4K (8MP) RGB-IR CMOS image sensor from ON Semiconductor.
- Targeted at next-generation smart electronic door locks, or eLocks, for both commercial and residential applications, the **Saturn reference design** is the AIoT industry's first to integrate AI processing for both single-camera structured-light sensing and fast-boot video processing. It is based on the Ambarella CV25 CVflow AI vision processor and includes a structured-light camera powered by Lumentum's VCSEL technology and the AR0237CS 2MP RGB-IR image sensor from ON Semiconductor.
- Targeted at intelligent sensing applications and with opportunities across verticals, Ambarella's CV2 series CVflow AI vision processor-based development kits can now be outfitted with ToF sensor adapters that are powered by Lumentum's leading-edge VCSEL arrays. An optional 4K RGB-IR image sensor adapter is also available for these kits.

The open software development kit (SDK) for Ambarella's CVflow AI vision processors allows the easy integration of third-party applications while enabling OEMs to address differing regional requirements with a single platform (for example, using different AI algorithms in different regions). Additionally, this robust, Linux-based SDK expands the capabilities of edge sensing devices, simplifies product development and speeds time-to-market through:

- Custom application development capabilities
- Support for different 3D modalities, including structured light and ToF. Uniquely, a single Ambarella SoC provides 3D sensing processing without the need for a dedicated depth processor or a separate host processor
- High AI inference capabilities on the camera device to enable multiple neural networks (NNs) running simultaneously
- Robust AI tools to support deep neural network (DNN) development and migration
- Integrated ISP to handle challenging scenes, including high dynamic range (HDR) and low light scenarios
- Built-in Arm® processors to run customer applications
- Integrated security hardware, including secure boot, OTP to store encryption keys and Arm TrustZone technology for secure encryption key comparisons
- Rich peripheral interface support to simplify system designs

Availability

These joint reference designs and development kits are expected to be available in June. For more information, contact Ambarella: <https://www.ambarella.com/contact-us/>.

Additionally, the three companies will present these new joint solutions on June 2 in a [live webinar](#) hosted by Laser Focus World magazine.

About Ambarella

Ambarella's products are used in a wide variety of human and computer vision applications, including video security, advanced driver assistance systems (ADAS), electronic mirror, drive recorder, driver/cabin monitoring, autonomous driving and robotics applications. Ambarella's low-power systems on chip (SoCs) offer high-resolution video compression, advanced image processing and powerful deep neural network processing to enable intelligent cameras to extract valuable data from high-resolution video streams. For more information, please visit www.ambarella.com

About Lumentum

Lumentum (NASDAQ: LITE) is a market-leading designer and manufacturer of innovative optical and photonic products enabling optical networking and laser applications worldwide. Lumentum optical components and subsystems are part of virtually every type of telecom, enterprise, and data center network. Lumentum lasers enable advanced manufacturing techniques and diverse applications including next-generation 3D sensing capabilities. Lumentum is headquartered in San Jose, California with R&D, manufacturing, and sales offices worldwide. For more information, visit www.lumentum.com.

About ON Semiconductor

ON Semiconductor (Nasdaq: [ON](#)) is driving energy efficient electronics innovations that help make the world greener, safer, inclusive and connected. The company has transformed into our customers' supplier of choice for power, analog, sensor and connectivity solutions. Our superior products help engineers solve their most unique design challenges in automotive, industrial, cloud power, and Internet of Things (IoT) applications. ON Semiconductor operates a responsive, reliable supply chain and quality programs, and robust ESG programs. Headquartered in Phoenix, Arizona, the company has a global network of manufacturing facilities, sales and marketing offices and engineering centers in its key markets.

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A graphic accompanying this announcement is available at <https://www.globenewswire.com/NewsRoom/AttachmentNg/1301d53b-3156-4903-8a5c-4f2c7f891e4b>

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Ambarella, Lumentum and ON Semiconductor collaborate on AI processing based 3D sensing for next-gen AIoT devices, offering industry-first approaches, across verticals, for biometric access control, 3D electronic locks and intelligent sensing.