



Lumotive and Himax Technologies Target Autonomous Vehicles with Industry-First Liquid Crystal on Silicon Solution for High-Performance LiDAR Systems

Seattle, WA and Tainan, Taiwan – September 3, 2019 – Lumotive, the Bill Gates-funded startup developing LiDAR systems for autonomous vehicles, and Himax Display, Inc., a subsidiary of Himax Technologies, Inc. (NASDAQ:HIMX), today announced a first-of-its-kind, jointly-developed solution to enable disruptive beam steering technology in LiDAR systems that marries Himax’s proven Liquid-Crystal-On-Silicon (LCOS) technology with Lumotive’s patented Liquid Crystal Metasurfaces™ (LCMs) to significantly improve the performance, reliability and cost of LiDAR systems. In the automotive industry, Lumotive’s LiDAR solution will enable both advanced driver-assistance systems (or ADAS) and fully autonomous vehicles such as “robo-taxis” and self-driving trucks.

LiDAR, a key 3D-sensing technology for autonomous driving systems, requires advanced beam steering to deliver high performance and commercial viability. Traditionally, LiDAR relied on bulky spinning assemblies, while newer breeds of LiDAR sensors utilize MEMS mirrors or optical phased arrays. However, both of these approaches lack performance due to the small optical aperture of MEMS mirrors and the low efficiency of phased arrays. In a first for LiDAR, Lumotive leverages Himax’s unique, tailor-made LCOS process to convert semiconductor chips into dynamic displays that steer laser pulses based on the light-bending principles of metamaterials.

“Himax’s industry-leading LCOS technology and in-depth LC know-how perfectly complement our LCM technology,” said Lumotive co-founder and CEO, Dr. William Colleran. “Our combined approach is an innovative technological advance that lowers cost, improves performance and ultimately speeds time-to-market for reliable LiDAR systems that make self-driving cars viable and safe.”

“We are very excited to be working with Lumotive to deliver a true breakthrough in the development of LiDAR systems for the autonomous vehicle market,” said Jordan Wu, President and Chief Executive

Officer of Himax Technologies. “While the approach is unique, our industry-leading LCOS technology and tailor-made service are market-proven and, when combined with Lumotive’s patented LCM technology, represent a significant advance in an increasingly important industry.”

LiDAR and the Lumotive Advantage

LiDAR systems determine range by emitting laser light pulses and measuring the round-trip flight time for those pulses to travel to and reflect back from objects. A LiDAR system creates a 3D perceptual map, or “point cloud” of its surroundings by scanning, or “beam steering”, laser pulses across its two-dimensional field-of-view, with the third dimension derived from the distance measured to an object at a given horizontal and vertical position. LiDAR has proven critical for autonomous vehicles because the technology can accurately locate objects to within a few centimeters at ranges of hundreds of meters. LiDAR, which stands for Light Detection and Ranging, generally exhibits shorter range but superior measurement resolution compared to its older cousin, radar, which stands for Radio Detection and Ranging. Research firm Yole Développement estimates that the ADAS and autonomous vehicle LiDAR markets will grow dramatically in the coming years, increasing from \$721 million in 2018 to \$6.3 billion in 2024, with a CAGR of nearly 45% during that period.

Lumotive’s LCM™ chips contain no moving parts and are fabricated using mature semiconductor manufacturing processes and Himax’s tailor-made LCOS technology to enable commercially viable LiDAR systems with low cost, high reliability and small size. In addition to cost and performance advantages, Lumotive LCMs can be integrated into small form-factor systems, appealing for other applications in industrial and consumer sectors. Lumotive’s LiDAR systems offer dramatic performance advantages, including an unprecedented combination of:

- Large optical aperture (25 x 25 mm) which delivers long range
- 120-degree field-of-view with high angular resolution
- Fast, random-access beam steering

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About Lumotive

Founded in 2018 with funding from Microsoft founder, Bill Gates, Lumotive is a leader in solid-state LiDAR, developing high-performance systems for autonomous vehicles. The Seattle-based company’s LiDAR solutions leverage revolutionary beam steering technology based on patented Liquid Crystal

Metasurfaces™ to deliver an unprecedented combination of high performance (as measured by range, resolution and frame rate) and readiness for mass adoption (measured by cost, reliability and size). Lumotive's beam steering chips enable this unique combination because they are optically large, enabling high performance, and manufactured with mature semiconductor processes, enabling low cost and high reliability. For more information, go to www.lumotive.com or follow us on Twitter @LumotiveLidar.

Lumotive

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About Himax Technologies, Inc.

Himax Technologies, Inc. (NASDAQ: HIMX) is a fabless semiconductor solution provider dedicated to display imaging processing technologies. Himax is a worldwide market leader in display driver ICs and timing controllers used in TVs, laptops, monitors, mobile phones, tablets, digital cameras, car navigation, virtual reality (VR) devices and many other consumer electronics devices. Additionally, Himax designs and provides controllers for touch sensor displays, in-cell Touch and Display Driver Integration (TDDI) single-chip solutions, LED driver ICs, power management ICs, scaler products for monitors and projectors, tailor-made video processing IC solutions, silicon IPs and LCOS micro-displays for augmented reality (AR) devices and heads-up displays (HUD) for automotive. The Company also offers digital camera solutions, including CMOS image sensors and wafer level optics for AR devices, 3D sensing and machine vision, which are used in a wide variety of applications such as mobile phone, tablet, laptop, TV, PC camera, automobile, security, medical devices, home appliance and Internet of Things. Founded in 2001 and headquartered in Tainan, Taiwan, Himax currently employs around 2,100 people from three Taiwan-based offices in Tainan, Hsinchu and Taipei and country offices in China, Korea, Japan, Israel, and the US. Himax has 2,931 patents granted and 561 patents pending approval worldwide as of June 30th, 2019. Himax has retained its position as the leading display imaging processing semiconductor solution provider to consumer electronics brands worldwide.

<http://www.himax.com.tw>

Forward Looking Statements

Factors that could cause actual events or results to differ materially include, but not limited to, general business and economic conditions and the state of the semiconductor industry; market acceptance and competitiveness of the driver and non-driver products developed by the Company; demand for end-use applications products; reliance on a small group of principal customers; the uncertainty of continued success in technological innovations; our ability to develop and protect our intellectual property; pricing pressures including declines in average selling prices; changes in customer order patterns; changes in estimated full-year effective tax rate; shortages in supply of key components; changes in environmental

laws and regulations; exchange rate fluctuations; regulatory approvals for further investments in our subsidiaries; our ability to collect accounts receivable and manage inventory and other risks described from time to time in the Company's SEC filings, including those risks identified in the section entitled "Risk Factors" in its Form 20-F for the year ended December 31, 2018 filed with the SEC, as may be amended.

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