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Aeluma Achieves Photodetector Performance Milestone with its Large-Diameter Wafer Manufacturing Platform

Aeluma's Proprietary Technology Potentially Disruptive in Lowering Cost for Automotive LiDAR and Other Markets

GOLETA, CA / ACCESSWIRE / March 2, 2023 /[Aeluma, Inc.](#) (the "Company") (OTCQB:ALMU), a semiconductor company specializing in scalable, cost-effective technologies for LiDAR (light detection and ranging), communication, and sensing, announced today a performance breakthrough for a new class of photodetectors. State-of-the-art performance was demonstrated on Aeluma's large-diameter wafer manufacturing platform.

Aeluma's latest photodetector demonstration validates the potential of their technology to enable high quantum efficiency while maintaining low dark current up to a temperature of 105°C, which is specified for automotive applications. Aeluma management believes the recent data represent record performance metrics and mark an important milestone in the evolution of photodetector products that could offer both high performance and low cost for emerging markets such as automotive LiDAR, communication, mobile, AR/VR, quantum computing, and AI.

"This announcement is the culmination of our team's hard work to advance our proprietary technology," said Aeluma's CEO, Jonathan Klamkin, PhD. "Aeluma's ability to manufacture high performance compound semiconductor devices on large-diameter substrates has the potential to enable volume scaling and cost reduction."

Photodetectors are widely used for LiDAR, communication, and sensing applications. For LiDAR, common photodetector technologies are silicon SPAD (single-photon avalanche diode) and InGaAs (indium gallium arsenide) photodiode.

Silicon SPADs are produced in large volumes and at low cost with large-diameter substrates in a CMOS (complementary metal-oxide semiconductor) manufacturing environment. These photodetectors, however, typically demonstrate much lower efficiency than InGaAs photodiodes. Additionally, LiDAR using these devices operate in the 905-940nm wavelength region, which requires relatively low laser power to maintain eye safety. This limits the LiDAR's range, which is the maximum distance at which an object can be detected. Increasing the photodetector efficiency in the 905-940nm range could improve LiDAR performance.

InGaAs is a compound semiconductor with much better material characteristics than silicon. InGaAs can detect between 900-1700nm, including 1550nm, which is commonly used for

long-range and high performance LiDAR. These devices also demonstrate higher efficiency than silicon. Eye safety can be maintained at significantly higher laser power at 1550nm, therefore enabling better resolution at longer distances. The drawback to InGaAs is that it is conventionally manufactured on small substrates with specialty, low-throughput manufacturing. It is an expensive technology that does not inherently scale to the volumes necessary for mass market adoption.

Aeluma's technology breaks the limitations of conventional manufacturing and combines the best of both methodologies -- large-diameter wafer manufacturing with high performance compound semiconductors. Aeluma's technology spans the 900-1700nm wavelength range. It can improve the performance of the common 905-940nm photodetectors, which is the focus of today's announcement. Also, for long range LiDAR based on 1550nm, Aeluma's technology has potential to scale to mass market volumes and significantly reduce cost.

About Aeluma, Inc.

Aeluma (www.aeluma.com) develops novel optoelectronic devices for sensing and communications applications. Aeluma has pioneered a technique to manufacture devices using high performance compound semiconductor materials on large-diameter silicon wafers that are commonly used for mass market microelectronics. The technology has the potential to enhance performance and provide a path to cost-effective, large-scale manufacturing, both of which are critical for future LiDAR and other sensor applications. Aeluma is developing a streamlined business model from its headquarters in Goleta, CA that has a state-of-the-art manufacturing cleanroom.

Forward-Looking Statements

All statements in this press release that are not historical are forward-looking statements, including, among other things, statements relating to the Company's expectations regarding its market position and market opportunity, expectations and plans as to its product development, manufacturing and sales, and relations with its partners and investors. These statements are not historical facts but rather are based on the Company's current expectations, estimates, and projections regarding its business, operations and other similar or related factors. Words such as "may," "will," "could," "would," "should," "anticipate," "predict," "potential," "continue," "expect," "intend," "plan," "project," "believe," "estimate," and other similar or related expressions are used to identify these forward-looking statements, although not all forward-looking statements contain these words. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties, and assumptions that are difficult or impossible to predict and, in some cases, beyond the Company's control. Actual results may differ materially from those in the forward-looking statements as a result of a number of factors, including those described in the Company's filings with the Securities and Exchange Commission. The Company undertakes no obligation to revise or update information in this release to reflect events or circumstances in the future, even if new information becomes available.

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