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GaN-based e-Beam Inspection and Metrology Co-developed by Startup Photo electron Soul Inc. and Nagoya University Will be Evaluated by Kioxia, a Leading Flash Memory Producer

Partnership Marks Major Breakthrough in Inspection and Metrology for Advanced Semiconductor Manufacturing

NAGOYA, Japan – It was announced today that GaN (Gallium Nitride)-based e-Beam inspection and metrology for advanced semiconductor manufacturing, jointly developed by Nagoya University startup Photo electron Soul Inc. (PeS; CEO: Takayuki Suzuki) and the Nagoya University Amano-Honda Laboratory, will be evaluated by Kioxia Iwate Corporation (President and CEO: Koichiro Shibayama) in late September. During the critical field test, Kioxia Iwate will evaluate and verify the benefits of adopting this advanced technology to improve overall manufacturing yield by enhancing defect detection and root-cause analysis within live inspection and metrology processes.

3D flash memory is a sophisticated device characterized by a memory cell stacked structure. Kioxia has been developing advanced inspection and metrology techniques that tackle the manufacturing challenges posed by increasing layers and higher integration. The two key technologies (photocathode e-Beam inspection and metrology) under evaluation by Kioxia enable critical functions like non-contact electrical inspection, defect detection, and profile measurement in deep regions of high-aspect-ratio structures, which are difficult to achieve with traditional methods. These functions are unique to GaN-based photocathode e-Beam technology, including DSeB (Digital Selective e-Beaming) and YCeB (Yield Controlled e-Beaming). They allow innovative inspection and metrology through selective e-Beam radiation and real-time control of beam intensity, thus preventing any beam misalignment.

“This evaluation provides a great opportunity for us to prove that our inspection and metrology technology is unmatched. No other inspection tool supplier has yet commercialized it, and it is ready for production in a semiconductor manufacturing environment,” said Takayuki Suzuki, CEO of PeS. “We are confident that this will become a core technology for Kioxia, enabling them to significantly enhance their advanced inspection and metrology capabilities and outperform rival NAND flash producers in Korea and the US.”

About Kioxia
Kioxia is a world leader in memory solutions, dedicated to the development, production and sale of flash memory and solid-state drives (SSDs). In April 2017, its predecessor Toshiba Memory was spun off from Toshiba Corporation, the company that invented NAND flash memory in 1987. Kioxia is committed to uplifting the world with “memory” by offering products, services and systems that create choice for customers and memory-based value for society. Kioxia's innovative 3D flash memory technology, BiCS FLASH™, is shaping the future of storage in high-density applications, including advanced smartphones, PCs, automotive systems, data centers and generative AI systems. Kioxia Iwate Corporation is an advanced 3D flash memory plant.
https://www.kioxia-iwate.co.jp/en/

About Nagoya University
Founded in 1939 as one of Japan's seven former Imperial Universities, Nagoya University is a leading research institution with three campuses in Nagoya City. It comprises 9 faculties and 13 graduate schools as well as 3 attached institutes, 5 shared-use/research bases, and 21 specialized joint educational research facilities. In 2020, Nagoya University partnered with Gifu University to establish the Tokai National Higher Education and Research System. Nagoya University has achieved numerous world-class research accomplishments, including the work of six Nobel Prize winners who are affiliated with the university. It continues to pioneer world-class research while promoting a forward-looking model of collaborative education and research.
https://en.nagoya-u.ac.jp/

About Photo electron Soul
Established in 2015, Photo electron Soul Inc. is a startup company launched by Nagoya University, founded based on the technologies that have been cultivated and enhanced by Nagoya University for over 30 years. It is the only company in the world that supplies semiconductor photocathode e-beam systems for industrial applications. With this semiconductor photocathode e-beam technology as its core, the company aims at providing products and services created by combining multiple different technology fields to lead innovations in a wide range of industries, including electronic devices, life science, and engineering.
https://photoelectronsoul.com/en/

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