KIOXIA

Press Release

KIOXIA Commences Sample Shipments of 9th Generation BiCS FLASH™ 512Gb TLC Devices

Combine Existing Memory Cell and Advanced CMOS Technologies to Maximise Investment Efficiency

Germany, Düsseldorf, 25 July 2025 – KIOXIA Europe, a world leader in memory solutions, today announced it has commenced sample shipments[1] of 512Gb Triple-Level Cell (TLC) memory devices incorporating its 9th generation BiCS FLASH™ 3D flash memory technology. It plans to begin mass production in fiscal year 2025. The devices are designed to support applications requiring high performance and exceptional power efficiency in low- to mid-level storage capacities. They will also be integrated into KIOXIA's enterprise SSDs, in particular those that aim to maximise GPU efficiency in AI systems.

KIOXIA continues to pursue a dual-axis strategy to address the diverse needs of cutting-edge applications, delivering competitive products while providing optimal investment efficiency. The two axes are:

- 9th generation BiCS FLASH™ products: these achieve high performance at reduced production cost by leveraging CBA (CMOS directly Bonded to Array) technology[2], which integrates existing memory cell technologies[3] with the latest CMOS technology.

- 10th generation BiCS FLASH™ products: these incorporate an expansion in the number of memory layers to meet the expected future demand for larger-capacity, high-performance solutions.

The new 9th generation BiCS FLASH™ 512Gb TLC, developed using a 120-layer stacking process based on 5th generation BiCS FLASH™ technology and advanced CMOS technology, exhibits significant performance improvements over KIOXIA's existing BiCS FLASH™ products[4] with the same 512Gb capacity. These include:

- Write performance: 61% improvement
- Read performance: 12% improvement
- Power efficiency: enhanced by 36% during write operations and 27% during read operations
- Data transfer speed: the Toggle DDR6.0 interface enables high-speed 3.6Gb/s[5] NAND interface performance
- Bit density: increased by 8% through advancements in planar scaling

Additionally, KIOXIA has confirmed that the 512Gb TLC operates at NAND interface speeds of up to 4.8Gb/s[5] under demonstration conditions.

The product line-up will be determined in accordance with market demands.

"TLC's advantages of higher storage density, cost effectiveness and performance offered through KIOXIA's 9th generation BiCS FLASH™ 3D flash memory will be well-suited for Internet of Things devices and embedded systems in the industrial and automotive sector where cost and capacity are most important. It will also provide affordable, high-capacity storage through Cloud Storage Services and read-heavy tasks like seen in AI and Machine Learning," adds Axel Störmann, Vice President and Chief Technology Officer for Memory and SSD products, KIOXIA Europe GmbH.

KIOXIA is committed to strengthening its global partnerships and pursuing further innovation in order to continue delivering optimal solutions that meet the diverse needs of its customers.

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Notes:

1. These samples are for the functional check purpose and the specifications of the samples may differ in mass production.
2. Technology wherein each CMOS wafer and cell array wafer are manufactured separately in their optimized condition and then bonded together.
3. A 112-layer 5th generation BiCS FLASH™ and a 218-layer 8th generation BiCS FLASH™ technologies. The new lineup of 9th generation BiCS FLASH™ products will incorporate one of these, depending on the model.
4. 6th generation BiCS FLASH™, which is deploying the same 512Gb TLC product as this product.
5. 1Gbps is calculated as 1,000,000,000bits/second. This value is obtained under specific our test environment, and may vary depending on use conditions.

*In every mention of a KIOXIA product: Product density is identified based on the density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application. For details, please refer to applicable product specifications. The definition of 1Gb = 2^30 bits = 1,073,741,824 bits.

*Read and write speeds are the best values obtained in a specific test environment at KIOXIA and KIOXIA warrants neither read nor write speeds in individual devices. Read and write speed may vary depending on device used and file size read or written.

*Company names, product names and service names may be trademarks of third-party companies.

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.

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