XL-FLASH: Designed for Speed

KIOXIA delivers flash-based products for next-generation storage applications. Having invented NAND flash over 30 years ago, KIOXIA is now one of the world’s largest flash memory suppliers – and continues to move the technology forward.

What is XL-FLASH™?

XL-FLASH is extremely low-latency, high-performance flash memory that is based on KIOXIA’s BiCS FLASH™ 3D flash memory technology. It was designed to address the performance gap between existing volatile memories and NAND flash. XL-FLASH is classified as Storage Class Memory (or persistent memory), meaning RAM with the ability to retain its contents like NAND flash memory – bridging the performance gap of DRAM and NAND.

KEY FEATURES

- 128Gb¹ die (2-die, 4-die, 8-die package - available now; further scaling & density options possible with MLC)
- 4KB page size for more efficient operating system reads and writes
- Based on the latest BiCS FLASH process technology
- Lower cost compared to DRAM and cross point type SCM
- 16-plane architecture for improved latency
- High cell reliability
- Scalable 3D BiCS FLASH technology
- Fast page read and program time
- Compatible flash protocol/package

Where does XL-FLASH fit in the Memory Hierarchy?

APPLICATIONS

- Targeting the Storage Class Memory (SCM) layer between DRAM and NAND
- Data center storage
- Fast-tier storage Memory extension
- Enterprise storage

“With XL-FLASH, we are giving hyperscalers and enterprise server/storage providers a more cost-effective, lower latency storage solution that bridges the gap between DRAM and NAND performance.”

– Scott Nelson, Senior Vice President and General Manager, Memory Business Unit, KIOXIA

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BiCS FLASH:
Accelerating Beyond 2D

- Aug. 2019: XL-FLASH 128Gb¹ die introduced in 2-, 4-, 8-die packages (SLC BiCS FLASH)
- Aug. 2018: XL-FLASH concept introduced at Flash Memory Summit
- Jul. 2018: Achieved industry’s highest single-chip capacity of 1.33Tb¹,² (QLC BiCS FLASH)
- Jun. 2017: First to introduce 4-bit-per-cell technology² (QLC BiCS FLASH)
- Aug. 2015: First to introduce 256Gb¹ 48-layer memory chip⁴ (TLC BiCS FLASH)
- Jun. 2007: First to announce 3D flash memory technology⁵

The Storage Class Memory market is expected to reach in excess of $3 billion in 2022⁶.

![XL-FLASH Diagram]

¹ 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, including but not limited to: bad blocks, formatting, fixed information, and cell deactivation. For more information, please visit our Website at www.kioxia.com (last updated on May 2020).

² KIOXIA Survey: June 2017

³ KIOXIA Survey: August 2015

⁴ KIOXIA VLSI Presentation: June 2007

⁵ KIOXIA 3D Flash Technology


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