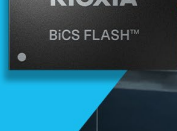


KIOXIA

Make It with KIOXIA

Take your storage solution to the next level with KIOXIA BiCS FLASH™ Generation 8 flash memory



KIOXIA BiCS FLASH™ generation 8: with CBA technology

Solution for emerging and data-centric applications: AI, Automotive, IoT and Data Centre

With a new approach to interfacing CMOS-based memory controller circuitry to flash memory arrays, KIOXIA **BiCS FLASH™** generation 8 3D flash memory technology products set new performance benchmarks for Flash devices.

The innovation with KIOXIA's previous generation of BiCS FLASH™ was to build arrays directly atop the CMOS circuitry. The bonding technique we devised to support this architecture is called CMOS under array (CUA). With the new BiCS FLASH™ generation 8 3D flash memory, we produce our CMOS separately from our arrays. The processes used to create CMOS-based circuitry and flash memory arrays differ, so producing each separately greatly simplifies the overall BiCS FLASH™ manufacturing process.

The novel new step is flipping the arrays over and bonding CMOS and arrays face to face. This structure leads to more direct and higher-performance connectivity between CMOS and array. The data transfer rate in our BiCS FLASH™ generation 8 3D flash memory is 3.6 gigabits per second (Gbps), 80% faster compared to the previous generation BiCS FLASH™.

[Watch CBA technology video now ›](#)

This new architecture required the creation of another new bonding technique: **CMOS bonded directly to array** (CBA). With previous gen. CUA, the thermal budget during cell array formation restricts CMOS performance. In addition to speed gains, power efficiency has been improved by 30%.

CBA technology also supports the increase in the 8th gen. flash memory array from 162 levels to 218, with 50% higher bit density, paving the way for the creation of a massive 4 terabyte (TB) device in a single package.

CBA technology will scale well, supporting the decrease in memory cell dimensions in subsequent device generations. Chip area can be reduced further and performance will concomitantly improve.

Also in contrast to CUA bonding, CBA makes it possible to eliminate high aspect ratio contacts (HARCs) and use low-resistance copper instead. A subsequent step will be to employ high-k/metal gate (HKMG) technology for the CMOS, which will contribute greatly to further performance improvements in future products utilizing BiCS FLASH™ 3D flash memory technology.

Key Features

- 80% Interface speed increase (3.6 Gbps)
- 20% Write performance improvement
- >10% Read latency improvement
- 50% Higher bit density
- 30% Power efficiency improvement

Target Applications

Data centers demand the greatest throughput and efficiency possible. KIOXIA BiCS FLASH™ generation 8 3D flash memory is unique in that it will simultaneously fulfil a set of key data center needs, including greater density per rack slot, better power efficiency, and superior input/output operations per second and quality of service (IOPS/QoS) for storage. A wide range of other applications will greatly benefit from the advantages of BiCS FLASH™ too, including but not limited to automotive, tablets, smartphones, and Internet of Things (IoT) applications.

Target Applications



IoT



Gaming/AR/VR



Automotive



Data Centers



PCs



Enterprise



Tablets



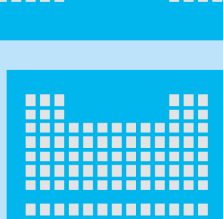
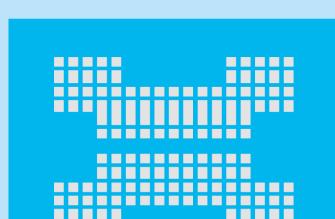
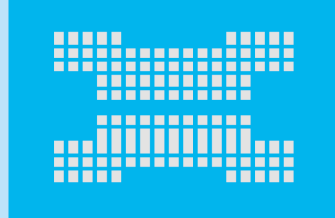
Smartphones

Available Densities and Packaging

KIOXIA offers one of the first 4TB single package devices based on a 16-die stacked 2Tb QLC architecture (Source: KIOXIA, July 2024). Other TLC and QLC options are available.

TLC (Triple-Level Cell)

1TB



132BGA

12mm x 18mm

152BGA

14mm x 18mm

154BGA

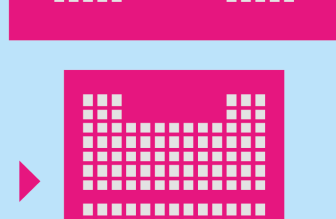
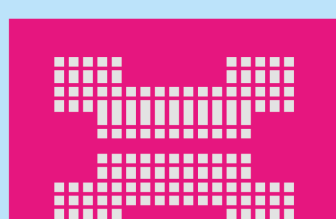
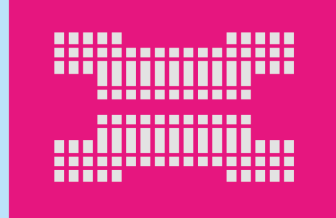
11.5mm x 13.5mm

(28% smaller) –

Now Available

QLC (Quad-Level Cell)

1TB/2TB



Find out more about KIOXIA BiCS FLASH™ generation 8 3D flash memory with CBA technology

[Visit website ›](#)

KIOXIA

KIOXIA Europe GmbH

Hansaallee 181, 40549 Düsseldorf, Germany

Tel +49-211-36877-0

www.kioxia.com

Follow us on:

