KIOXIA

Product Overview


*KIOXIA LC9 Series NVMe™ SSDs[1]*
*2.5-inch / E3.S / E3.L*

# KIOXIA Introduces LC9 Series NVMe SSDs for the Biggest AI, Object Storage and Data Lake Requirements

*Featuring Capacities up to 245 TB, PCIe Gen5 Performance, 2.5-inch / E3.S / E3.L Form Factors, and BiCS FLASH™ Generation 8 QLC Memory*

First generation KIOXIA LC9 Series NVMe SSDs are designed for tomorrow's biggest storage requirements equipped with the capacities, form factors and features to address the most demanding AI, object storage and massive data lake requirements to date. With capacities from 30.72 TB up to 245.76 TB, combined with BiCS FLASH generation 8, 2 terabit[10] (Tb) QLC die, the KIOXIA LC9 Series represents the world's highest capacity and most dense SSDs[11] to date.

KIOXIA LC9 Series SSDs leverage the successful controller, hardware and firmware from previous KIOXIA CM Series NVMe SSD generations which equates to a more robust, trusted design that reduces the qualification effort and deployment risk. These high-capacity SSDs are PCIe 5.0 and NVMe 2.0 specification compliant and are designed to the Enterprise and Datacenter Standard Form Factor (EDSFF) E3.L and E3.S specifications. This enables KIOXIA LC9 Series SSDs to address specific performance, power and thermal requirements of the Open Compute Project® (OCP) Datacenter NVMe SSD Specification Version 2.5[5] for cloud-optimized storage.

The BiCS FLASH generation 8, 2 Tb QLC 32-die stack technology enables the KIOXIA LC9 Series to offer the highest capacity form factors in the industry:

- *2.5-inch SSDs: up to 122.88 TB for the most common servers today*
- *E3.S SSDs: up to 122.88 TB for all flash (AF)-centric servers*
- *E3.L SSDs: up to 245.76 TB for ultra-capacity density AF servers/storage*

Utilizing the high-capacity KIOXIA LC9 Series yields the following storage capabilities for 2U servers:

- *Future 40 slot E3.L 1T server: over 9.8 petabytes[3] (PB) (40 x 245.76 TB)*
- *Typical 24 slot 2.5-inch server: over 2.9 PB (24 x 122.88 TB)*
- *Typical 32 slot E3.S 1T server: over 3.9 PB (32 x 122.88 TB)*

The KIOXIA LC9 Series are read-intensive SSDs with a Drive Write per Day[12] (DWPD) endurance rating of 0.3.

## Top Use Cases

### AI / HPC Applications

Artificial intelligence (AI) and high-performance computing (HPC) workloads are increasing their reliance on software-defined storage (SDS) - very flexible and all-flash optimized storage software that can be layered on top of any kind of server hardware, and customizable to specific use cases. SDS applications like Weka®, MinIO®, Ceph®, Hammerspace®, PEAK:AIO, and others, are enabling massive data storage for growing and evolving GPU-enabled AI and HPC workloads. These solutions are flash-centric and can take advantage of unique storage advantages afforded by QLC media. AI applications require massive amounts of data to be ingested and processed rapidly as traditional HDDs are too slow to keep up, leaving expensive GPUs underutilized. High capacity, high-performance SSDs, such as KIOXIA LC9 Series NVMe SSDs, are ideal for this scale, as HDDs cannot match the performance or power efficiency needed for such large-scale AI workloads.

## KIOXIA LC9 Series NVMe SSD Specifications[2]

**PCIe® Gen5 Performance**

| | |
|---|---|
| Sequential Read: | up to 12,000 MB/s* |
| Sequential Write: | up to 3,000 MB/s |
| Random Read: | up to 1,300 KIOPS^ |
| Random Write: | up to 80 KIOPS |

**MB/s = megabytes per second*
*^IOPS = input/output operations per second*

**Supported Capacities**

*30.72 terabytes[3] (TB)*
*61.44 TB*
*122.88 TB*
*245.76 TB*

**Enterprise-grade QLC**

*2.5 million MTTF[4]*
*3-month data retention*
*Dual and single port support (all SKUs)*

**Supported Industry Specifications**

*Full PCIe 5.0 support (all SKUs)*
*NVMe 2.0 support*
*OCP® v2.5 support[5]*

**Security/Encryption Options[6]**

*Secure Instant Erase[7] (SIE)*
*Self-Encrypting Drives[8] (SED)*
*FIPS 140-3 Level 2 SED validation[9]*

### Content Delivery Network Applications

KIOXIA LC9 Series NVMe™ SSDs are ideally suited for such applications as video and media content delivery/storage where there are few write operations and many read workloads. The capacity range of the series allows for tailored storage relating to specific data center architectures and software stacks. With PCIe® Gen5 read speeds, multiple concurrent users and applications can be supported, while the large capacity support can enable more content stored at the edge, closer to users.

### HDD Consolidation

Consider an HDD with a capacity of 30 TB. It takes eight 30 TB HDDs to equal the same massive storage capacity as one 245.76 TB E3.L KIOXIA LC9 Series NVMe SSD.

Significant benefits go well beyond just capacity and total cost of ownership (TCO). Compared to the eight 30 TB HDDs, a single KIOXIA LC9 Series NVMe SSD has up to 445% better sequential read performance, over 1,861 times better random read performance, and over 71 times better random write performance.


8 x 30 TB HDDs  1 x 245.76 TB SSD

*It takes eight 30 TB HDDs to equal the same massive storage capacity as one 245.76 TB E3.L SSD*

| Specification* | 8x 30 TB HDDs | 1x KIOXIA LC9 Series NVMe SSD | Improvement |
|---|---|---|---|
| **Power (max)** | ~72 Watts | 25 Watts | 65% |
| **Sequential Read** | ~2,200 MB/s | up to 12,000 MB/s | 445% |
| **Sequential Write** | ~2,200 MB/s | up to 3,000 MB/s | 36% |
| **Random Read** | ~5.5 MB/s *(4K block size)* | up to 10,240 MB/s *(16k block size)* | 1,861x |
| **Random Write** | ~5.5 MB/s *(4K block size)* | up to 819 MB/s *(16k block size)* | 148x |

**Based on published hard drive specifications of a leading capacity HDD vendor as of this publication date. It should be noted that the random performance of these HDDs utilized a 4K block size while the KIOXIA LC9 Series NVMe SSD utilized a 16k block size, and converted from KIOPS to MB/s for comparison.*

## More Information

Visit the KIOXIA enterprise SSD home page for timely KIOXIA LC9 Series NVMe SSD information as it becomes available.

**NOTES:**

[1] The KIOXIA LC9 Series NVMe SSD product images shown are representations of the design model and not accurate product depictions.

[2] KIOXIA LC9 Series NVMe SSD performance specifications are preliminary and subject to change. Read and write speed may vary depending on various factors such as host devices software (drivers, operating systems, etc.) and read/write conditions.

[3] Definition of capacity: KIOXIA Corporation defines a kilobyte (KB) as 1,000 bytes; a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes, a terabyte (TB) as 1,000,000,000,000 bytes and a petabyte (PB) as 1,000,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1Gbit = $2^{30}$ bits = 1,073,741,824 bits, 1GB = $2^{30}$ bytes = 1,073,741,824 bytes, 1TB = $2^{40}$ bytes = 1,099,511,627,776 bytes and 1PB = $2^{40}$ bytes = 1,125,899,906,842,624 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

[4] MTTF (Mean Time to Failure) is not a guarantee or estimate of product life; it is a statistical value created to mean failure rates for a large number of products which may not accurately reflect actual operation. Actual operating life of the product may be different from the MTTF.

[5] KIOXIA LC9 Series NVMe SSDs are designed to support the OCP Datacenter NVMe SSD Specification Version 2.5 (not all features are supported).

[6] Optional security feature compliant drives are not available in all countries due to export and local regulations.

[7] SIE: Sanitize Instant Erase is compatible with the Sanitize device feature set, which is the standard prescribed by NVM Express™, Inc., first introduced in the NVMe v1.3 specification, and improved in the NVMe v1.4 specification, and by the T10 (SAS) and T13 (SATA) committees of American National Standards Association (ANSI).

[8] A self-encrypting drive (SED) encrypts/decrypts data written to and retrieved from an SSD via a password-protected alphanumeric key, continuously encrypting and decrypting the data. In support of the SED security option (TCG-Opal/Ruby), there are a limited number of features not supported.

[9] FIPS 140-3 Level 2 SED validation validates that an SSD's cryptographic module is in compliance with the FIPS 140-3 standard developed by the National Institute of Standards and Technology (NIST) through its rigorous Cryptographic Module Validation Program (CMVP) certification process.

[10] The flash memory capacity is calculated as 1 terabit (1 Tb) = 1,099,511,627,776 ($2^{40}$ bits), and 1 terabyte (1 TB) = 1,099,511,627,776 ($2^{40}$ bytes).

[11] As of July 29, 2025. Based on KIOXIA Corporation survey.

[12] DWPD: Drive Write(s) Per Day: One full drive write per day means the drive can be written and re-written to full capacity once a day, every day, for the specified lifetime. Actual results may vary due to system configuration, usage, and other factors.