The industry-leading E3.L 245TB data center SSD[1] designed for AI, cloud, enterprise, and hyperscale storage

Data growth is no longer a wave; it's a tsunami. It is a flood.

The world is racing towards ~600 zettabytes of data by 2030[2] while the data center energy bill is on track to consume ~945TWh of electricity that same year. That's about the annual power consumption of all of Japan.[3]

The industry can't meet these immense AI data demands with more racks and more watts. Efficient scaling is the right answer. This era of storage is about petabytes per rack and per watt.

The Micron 6600 ION SSD addresses these challenges.

It is a capacity-focused PCIe Gen5 data center SSD that features full-stack integration, including Micron QLC G9 NAND, DRAM, controller, firmware, and validation, to help simplify qualifications and streamline deployment.

Micron 6600 ION SSD (U.2, E3.L, E3.S 1T)

Key Benefits

Designed for the exascale era[5]

- Store up to 9.8PB per 2U with the industry-leading E3.L 245TB SSD
- Smaller space: HDDs need up to 5.6 times as many racks to store 1EB.
- Enable immense storage in fewer servers, fewer racks, and less physical real estate and less carbon emissions

Sustainability at scale[6]

- Optimized for power-hungry workloads with up to 1.9x the power efficiency of high-capacity data center HDDs
- Use less physical real estate in the data center, helping save power, reduce carbon emissions, and improve sustainability

Leading-edge Micron SSD and NAND technology with vertical integration

- The first G9 QLC NAND shipping to OEMs in a high-capacity data center SSD[7]
- Industry-leading six-plane NAND architecture provides for higher degrees of parallelism, improving drive performance[8]
- Designed for demanding, capacity-focused workloads like AI data ingest and data lakes, hyperscale and cloud environments, and content delivery.

micron.com/6600-ION

1. Based on officially announced, sampling, and available 245.76TB SSDs from competitors as per public information available at the time of this document's publication.
2. See this article on ubs.com for more information.
3. See this page on iea.org for additional details on data center power consumption growth.
4. See this page on gminsights.com for additional details on data center power budget growth.
5. "Designed for the exascale era" means focused on capacity density, power efficiency, and performance based on public information related to commercially available data center HDDs at the time of this product's announcement. 1GB = 1 billion bytes; the formatted capacity will be less. Class refers to capacity-focused, data center storage solutions (SSDs or HDDs). Density refers to the calculated capacity per unit of rack space (the HDD value of 0.72PB per U is calculated and represents the theoretical maximum).

Drive type, form factor		Single drive capacity	Capacity per chassis (chassis size)	Storage density	Capacity per 36U	Storage density improvement (vs 245.76 Micron 6600 ION E3.L)
Micron 6600 ION	E3.L	245.76TB	9.8PB (40*245.76) (2U chassis)	4.9PB per U	176.9PB	(4.9PB per U / 0.88PB per U) = 5.6x HDD
	U.2	245.76TB	5.9PB (24*245.76) (2U chassis)	2.9PB per U	106.2PB	(2.9PB per U / 0.88PB per U) = 3.3x HDD
Capacity HDD (3.5-in.) 44TB		44TB	4.4PB (100*36TB) (5U chassis)	0.88PB per U	31.7PB	HDD is the baseline

Racks needed statement based on a 1 exabyte example (EB). Micron 245.76TB E3.L 6600 ION: 1EB / 176.9PB per rack = 5.7 racks. 44TB HDD: 1EB / 31.7 PB per rack = 31.5 racks. The difference calculated is (31.5 / 5.7) = 5.6; HDDs need 5.6 times as many racks to store 1EB. Less physical real estate assumes each rack occupies the same amount of floor space. Lower carbon emissions assume that the same type of electricity generation powers all storage devices in this example. Other values may produce different results.

6. Power efficiency is expressed in rated TB capacity / rated power in watts. Micron 6600 ION: 245.76TB @ 30 watts = 8.2TB managed per watt. 44TB HDD: 44TB @ 10 watts = 4.4TB managed per watt. The difference is calculated as (8.2 / 4.4) = 1.9x. Real estate statement refers to the square footage used and is based on the number of racks needed to store 1EB example. The 'less carbon emissions' statement assumes similar carbon emissions across power sources.
7. Based on public information available at the time of this product's announcement.
8. NAND leadership refers to Micron shipping the only G9 QLC NAND to OEMs in an SSD at the time of this product's announcement; SSD leadership refers to the Micron 6600 ION SSD being the industry's first E3.L 245.76TB data center SSD (all statements are based on public information available at the time of the product's announcement). See this page on investors.micron.com for additional details on Micron G9 NAND.

Maximize storage capacity, lower data center storage footprint

Traditional storage designs can make maximum storage density a constant challenge. The Micron 6600 ION E3.L and U.2 SSDs redefine the capacity per rack, providing up to 176.9PB compared to 25.9PB for HDDs. With 40 E3.L SSDs per 2U server, the Micron 6600 ION SSD offers up to 6.8x the capacity per rack versus legacy HDDs. These per-rack capacity improvements require less floor space and fewer servers to store the same amount of data, helping improve storage scalability.[9]

	Micron 6600 ION		Datacenter-class HDD	
Footprint factors	**E3.L 245.76TB**	**U.2 245.76TB**		**The Micron 6600 advantage**
Capacity per drive	245.76TB	245.76TB	44TB	Up to 5.6x
Capacity per U (#drives, chassis size)	4.9PB (40 SSDs, 2U)	2.9PB (24 SSDs, 2U)	0.88PB (100 HDDs, 5U)	Up to 5.6x
Capacity per rack	176.9PB	106.2PB	31.7PB	Up to 5.6x

Table 1: Micron 6600 ION SSD capacity, footprint comparison vs. HDD-based capacity solutions

Reduce power and cooling costs, lower carbon footprint at scale

Beyond capacity and density, the Micron 6600 ION SSD transforms power economics in the data center by helping reduce power consumption per terabyte, which, in turn, helps lower cooling demands and carbon emissions.

The Micron 6600 ION 245.76TB SSD is rated at a maximum power consumption of 30W, while traditional 36TB HDDs are typically rated at about 10W each. This enables the Micron 6600 SSD to manage 8.2TB per watt, significantly more than the 3.6TB per watt 36TB HDDs offer.[10] This improvement can help lower energy and cooling costs and reduce emissions, helping you meet your sustainability targets and keep TCO under control.

	Micron 6600 ION		Datacenter-class HDD	
Power, cooling factors	**E3.L 245.76TB**	**U.2 245.76TB**		**The Micron 6600 advantage**
Rated power consumption	30 watts	30 watts	10 watts	1.9x TB managed per watt[11]
TB managed per watt	8.2	8.2	4.4	

Table 2: Micron 6600 ION SSD power efficiency improvements over competitive SSD and HDD-based capacity solutions

Leading-edge Micron technology with vertical integration

Micron continues to push the boundaries of data storage technology with its industry-leading, ninth-generation QLC NAND-based SSDs. Built on an innovative, six-plane QLC NAND architecture that enables higher degrees of parallelism for more simultaneous READ/WRITE commands, this leading Micron QLC NAND technology offers an I/O rate of up to 3.6 GB/s.

The Micron 6600 ION SSD leverages a similar, vertically integrated architecture to other Micron data center SSDs, helping confidently enable qualification.[12]

Micron G9 QLC feature	The Micron G9 QLC advantage
G9 QLC NAND in an SSD	Leading NAND technology for capacity-focused, data center SSDs
Six-plane architecture	Improved parallelism for faster IO
Vertical integration	Qualify with confidence: Micron NAND, DRAM, controller, firmware, validation, and manufacturing.

Table 3: Micron G9 NAND advantages

9. Capacity per drive improvement calculated as (245.76TB / 44TB) = 5.6x. Capacity per U improvement calculated as (4.9PB / 0.88PB) = 5.6x. Capacity per rack improvement calculated as 176.9 / 37.1) = 5.6x.
10. TB per watt calculated as (245.76TB / 30 watts) = 8.2TB per watt; (44TB / 10 watts) – 4.4/TB per watt.
11. Micron 6600 ION = 8.2TB managed per watt; HDD = 4.4TB managed per watt; 8.2 / 4.4 = 1.9x.
12. Vertical integration refers to Micron designing and/or manufacturing of the SSD controller, firmware, NAND, DRAM, and SSD assembly and test.

Micron 6600 ION SSD key specifications

SSD capacity[13]		30.72TB	61.44TB	122.88TB	245.76TB
Form factors	**U.2 (15mm)**	✓	✓	✓	✓
	E3.S 1T (7.5mm)	✓	✓	✓	
	E3.L				✓
Performance[14] 128KB sequential transfers, 4KB random transfers	**Sequential read** (MB/s)	14,000	14,000	14,000	13,700
	Sequential write (MB/s)	2,700	2,900	3,000	3,000
	Random read (IOPS)	2,000,000	2,000,000	2,000,000	1,780,000
	Random write (4KB, IOPS)	100,000	40,000	42,000	42,000
	Random write (16KB, IOPS)	25,000	40,000	42,000	42,000
	Read latency (µs, QD1, TYP)	100			
	Write latency (µs, QD1, TYP)	15	20		
Power Consumption & Use Active average, RMS	**Maximum**	≤25W			≤30W
	Idle	≤5W			
Endurance by Workload[15]	**100% 128KB sequential writes**	1.0 SDWPD	1.0 SDWPD		
	100% 16KB random write	0.3 RDWPD	0.3 RDWPD		
	100% 4KB random write	0.3 RDWPD	0.075 RDWPD		
	Indirection unit	4KB	16KB		
Basic Attributes	**Interface**	PCIe Gen5 1x4 NVMe (v2.0b)			
	NAND	Micron G9 QLC NAND			
	MTTF[16]	2.5 million device hours			
	UBER	<1 sector per 10^{17} bits read			
Common features	**OCP and NVMe**	OCP 2.6, NVMe 2.0d, NVMe-MI 1.2d			
	Compliance and FIPS	TAA-compliant; FIPS 140-3 L2 certifiable			
	Security	CNSA 2.0, SPDM 1.2, Micron SEE, SED options			
	Additional	SGLs, SRIS, PCIe lane reversals			

Table 4: Micron 6600 ION SSD specifications overview

Note: All values provided are for reference only and are not warrantied values. For warranty information, visit this page on micron.com or contact your Micron sales representative. Values represent the theoretical maximum endurance for the given transfer size and type. Actual lifetime will vary by workload. Actual power consumption will vary by workload. All performance values shown are for a maximum power consumption of 25 watts.

Micron 6600 ION SSD part numbers

The Micron 6600 ION SSD part number information is provided below for configuration-dependent values (shown in bold). Other part number values in the example part number are fixed. See the parts catalog at micron.com/660-ION for more.

MT FD L **BQ** **245T8** Q HF - 1 BQ **4** **J** **AB** YY

Form factor
- AL = U.2 (15mm)
- BQ = E3.S 1T (7.5mm)
- BR = E3.L

Drive Capacity
- 30T7 = 30.72TB
- 61T4 = 61.44TB
- 122T8 = 122.88TB
- 245T8 = 245.76TB

Default Sector Size
- 1 = 512 bytes
- 4 = 4096 bytes

Extended Firmware Features
- J = OCP 2.6 (Non-SED)
- D = OCP 2.6 + SED (TCG Opal)[17]

Extended Options
- AB = Standard
- FC = FIPS (140-3 L2 certifiable + TAA)

13. Rated capacity; formatted capacity will be less; 1GB = 1 billion bytes.
14. Performance measured under the following conditions: Steady state as defined by SNIA Solid State Storage Performance Test Specification Enterprise v1.1; Drive write cache enabled; NVMe power state 0; Sequential workloads measured using FIO with a queue depth of 128; Random workloads measured using FIO with a queue depth of 512.
15. Actual lifetime will vary by workload. Total bytes written calculated assuming drive is 100% full (user capacity) with workload of 100% 4KB random in TB (first value) or 100% 128KB sequential (second value) in TB. Refer to the percentage used in the SMART/Health information (Log Identifier 02h) to check the device life used.
16. Product achieves MTTF based on population statistics, not relevant to individual units. 2.5M hour MTTF at 50°C in SMART per OCP REL-1.
17. No hardware, software or system can provide absolute security under all conditions. Micron assumes no liability for lost, stolen or corrupted data arising from the use of any Micron products, including those products that incorporate any of the mentioned security features.

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