The Micron 9650 is the world's fastest data center SSD and the first PCIe® Gen6 SSD

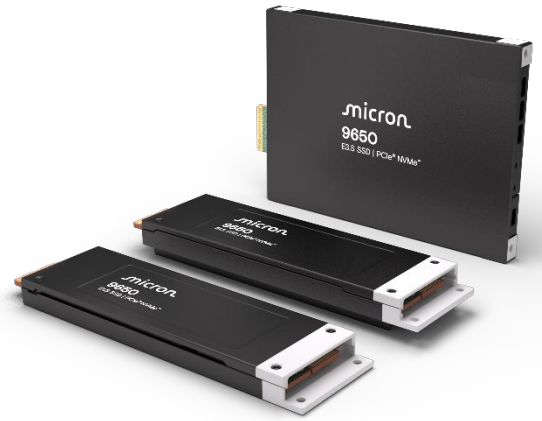
AI workloads often achieve less than 50% of peak GPU performance due to data bottlenecks[1]. With read speeds up to 28GB/s and 5.5M+ IOPS, the Micron 9650 SSD helps eliminate these bottlenecks, ensuring GPUs stay productive and ROI is maximized.

Data centers already consume 1–2% of global electricity, and their demand is expected to see a 160% increase by 2030, largely due to AI.[2] But power budgets can't keep up. While data center storage capacity grows at a 24% CAGR, power budgets grow at just 7.5%.[3] The Micron 9650 offers power efficiency and liquid cooling support to help mitigate the impact of this growth.

Solving all of these has become easier with the Micron 9650.

This performance-focused, PCIe Gen6 data center SSD features full-stack integration—from Micron G9 NAND and DRAM to controller, firmware, and validation to help simplify qualifications and streamline deployment.

Solutions like the Micron 9650 help deliver the data for a performant, sustainable, scalable infrastructure.



Micron 9650 NVMe SSD: E1.S (9.5mm and 15mm), E3.S 1T

Micron 9650 SSD key benefits

The first PCIe Gen6 SSD with up to double the performance of PCIe Gen5 SSDs[4]

The Micron 9650 SSD is the first PCIe Gen6 SSD for the data center. It is also the fastest in the industry, demonstrating up to 28GB/s of sequential read bandwidth [4]

This unprecedented performance makes it ideal for the most demanding AI data center workloads.

Exceptional energy efficiency helps lower carbon emissions for AI.

Energy efficiency is crucial for reducing operational costs and minimizing environmental impact.

Tailoring the Micron 9650 SSD for both performance and efficiency—while engineering it for advanced liquid cooling—enables AI systems to handle complex storage workloads with greater sustainability.[5]

Qualify with confidence with Micron innovation and ecosystem collaboration

Vertically integrated architecture with Micron DRAM, NAND, SSD controller, firmware, and validation helps simplify qualifying the Micron 9650. By developing the first PCIe Gen6 SSD in collaboration with industry leaders, this SSD also accelerates technology adoption.[6]

Industry-leading six-plane NAND architecture provides higher degrees of parallelism, where more read/write commands can be issued to the NAND simultaneously to help improve performance. Micron G9 NAND offers 3.6GB/s, the fastest NAND I/O rate shipping in an SSD.[7]

micron.com/9650

1. See https://arxiv.org/pdf/2503.08311 for additional details on the impacts of data fetch bottlenecks.
2. See https://www.goldmansachs.com/insights/articles/AI-poised-to-drive-160-increase-in-power-demandfor additional details on data center power consumption.
3. See https://www.fierce-network.com/cloud/heres-what-aws-microsoft-and-googles-capex-plans-mean-data-center-growth for additional details on data center storage capacity CAGR and https://www.gminsights.com/industry-analysis/data-center-power-market for additional details on data center power budget growth.
4. The Micron 9650 is the first PCIe Gen6 data center SSD sampling to OEM customers (first to sample to OEM customers and fastest statement refers to public information available at the time of this document's initial publication. Double the performance statement refers to 128KB sequential read bandwidth comparison between the Micron 9650 SSD at 28GB/s and the Micron 9550 SSD at 14GB/s..
5. Liquid cooling options are supported in the Micron 9650 E1.S (9.5mm) form factor. Contact your Micron representative for details.
6. Micron collaborated with early PCIe Gen6 ecosystem leaders like Astera Labs (see https://www.asteralabs.com/accelerating-the-pcie-6-x-ecosystem-industry-first-pcie-6-x-interop-demonstration-at-designcon/) and Broadcom (https://investors.broadcom.com/news-releases/news-release-details/broadcom-extends-pcie-industry-leadership-end-end-gen-6), CPU and GPU leaders, as well as platform and networking designers, and the PCIe Gen6 broad ecosystem in developing the Micron 9650 SSD.
7. To learn more about this leading Micron NAND, see https://investors.micron.com/news-releases/news-release-details/micron-announces-volume-production-ninth-generation-nand-flash.

Leading performance to feed demanding AI workloads

Tap into the power of innovative storage with the Micron 9650 SSD—a trailblazer in PCIe Gen6 SSD speed. The Micron 9650 SSD is tailored for the most challenging AI and data center workloads to process immense data sets with industry-leading performance.

Performance type	Micron 9650 SSD[8]	Prior generation	Micron 9650 SSD advantage
Sequential read	28,000 MB/s	14,000 MB/s	100% higher
Sequential write	14,000 MB/s	10,000 MB/s	40% higher
Random read	5.5 MIOPS	3.3 MIOS	61% higher
Random write	900 KIOPS	720 KIOPS	22% higher

Table 1: Micron 9650 maximum performance improvements

Superior energy efficiency that's liquid-cooling ready

The Micron 9650 SSD is built for energy efficiency, complemented by its available support for liquid cooling. This combination helps performance under the most demanding workloads.[9]

Workload		Micron 9650 SSD	Prior generation	Micron 9650 advantage
Sequential IO (read / write)	MB/s per watt	1,120	560	2X better
	MB/s per watt	560	400	1.4X better
Random IO (read / write)	KIOPS per watt	220	132	1.7X better
	KIOPS per watt	36	28.8	1.2X better
Liquid cooling support		Yes	No	Liquid cooling ready in E1.S 9.5mm form factor

Table 2: Micron 9650 energy efficiency improvements

Micron innovation is built in

The Micron 9650 NVMe SSD features Micron G9 TLC NAND, whose six-plane architecture delivers up to 3.6 GB/s I/O rate. Coupled with a PCIe Gen6 interface, this SSD enables top-tier performance.

Its vertically integrated design includes Micron DRAM, NAND, controller, firmware, and validation, helping ensure reliability. In contrast, ongoing PCIe Gen6 collaboration with ecosystem partners helps enhance platform interoperability in the expanding PCIe Gen6 market segment.

Micron innovation	Benefit
Vertical integration	Micron IP and components are fully vertically integrated, including Micron-designed SSD controller ASIC, Micron's leading G9 TLC NAND, Micron DRAM, and Micron-produced and validated SSD firmware.
Industry-leading G9 TLC NAND	Industry-leading six-plane NAND architecture provides higher degrees of parallelism to help improve performance, supporting more simultaneous read/write commands issued to the NAND. Supporting I/O rates up to 3.6 GB/s, this is the fastest NAND shipping in an SSD.[10]
Liquid Cooling optimized	E1.S 9.5mm hardware thermally designed from the ground up to support advanced liquid cooling solutions.
Security features built in[11]	SPDM 1.2 device security, self-encrypting drive (SED) options, Micron Secure Execution Environment (SEE), FIPS 140-3 Level 2, and TAA compliant options.

Table 3: Micron innovations

8. Values in Tables 1 and 2 reflect maximum values across all Micron 9650 capacities. For details, see the Micron 9650 key specifications table later in this document.
9. Efficiency values calculated as maximum performance / 25 watts power consumption. Micron 9650 SSD (28 GB/s / 25 watts = 1.120 GB/s per watt = 1,120 MB/s per watt); Micron 9550 SSD (14 GB/s / 25 watts = 0.56GB/s per watt = 560 MB/s per watt). 1,120 MB/s per watt / 560 MB/s per watt = 2X = 100% higher.
10. At the time of this document's initial publication.
11. 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.

Micron 9650 SSD key specifications

Form Factors		Micron 9650 PRO Read-intensive, one drive write per day			Micron 9650 MAX Mixed-use, three drive writes per day		
E1.S (9.5mm) – liquid cooling optimized		✓	✓				
E1.S (15mm) – air cooling optimized		✓	✓				
E3.S 1T		✓	✓	✓	✓	✓	✓
Capacities[12]		**7.68TB**	**15.36TB**	**30.72TB**	**6.4TB**	**12.8TB**	**25.6TB**
Sequential read (MB/s)[13]		28,000	28,000	28,000	28,000	28,000	28,000
Sequential write (MB/s)[13]		14,000	14,000	14,000	14,000	14,000	14,000
Random read (KIOPS)[13]		5,400	5,500	5,500	5,400	5,500	5,500
Random write (KIOPS)[13]		500	530	570	900	900	900
70/30 Random read/write (KIOPS)		1,000	1,100	1,100	1,500	1,500	1.500
Latency (TYP, µs)[14]		60 (rd.) 15 (wri.)	60 (rd.) 15 (wri.)	60 (rd.) 15 (wri.)	60 (rd.) 15 (wri.)	60 (rd.) 15 (wri.)	60 (rd.) 15 (wri.)
Endurance (TBW)[15]	RND	14,016	28,032	56,064	35,040	70,080	140,160
	SEQ	58,300	104,500	201,200	74,200	143,100	282,600

Table 4: Micron 9650 SSD performance summary

(Note: All values provided are for reference only and are not warranted values. For warranty information, visit https://www.micron.com/sales-support/sales/returns-and-warranties/enterprise-ssd-warranty 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.

Micron 9650 SSD: Standard Features		
Basic Attributes	Interface	PCIe Gen6.2 1x4, NVMe 2.0
	NAND	Micron G9 TLC NAND
	OCP compliance	OCP 2.6
Reliability	MTTF[16]	MTTF: 2.0M hours @ 0–55°C and 2.5M hours @ 0–50°C
	UBER	<1 sector per 10^{17} bits read
	Warranty	5 years
Environmental Characteristics	Power	Sequential read (average RMS value): up to 18W (PRO and MAX) Sequential write (average RMS value): up to 16W (PRO and MAX)
	Operating Temp.	0–70°C

Table 5: Micron 9650 SSD standard features

Micron 9650 SSD part numbers

The Micron 9650 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/9560 for more information.

MT FD M **CE** **30T7** T **HM** - 1 BP **1** **J** AB YY

Drive Form Factor
BT = EDSFF E1.S (9.5mm)
CE = EDSFF E1.S (15mm)
BQ = EDSFF E3.S (7.5mm)

Drive Capacity

PRO			MAX		
7T6	=	7.68TB	6T4	=	6.4TB
15T3	=	15.36TB	12T8	=	12.8TB
30T7	=	30.72TB	25T6	=	25.6T

Security Features
J = OCP 2.6 + Non-SED
D = OCP 2.6 + Opal 2.01

Sector Size
1 = 512 bytes
4 = 4096 bytes

Product Family
HM = 9650 PRO
HN = 9650 MAX

12. Unformatted. 1GB = 1 billion bytes. Formatted capacity is less.
13. 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 32; Random READ workloads measured using FIO with a queue depth of 512 (1,100,000 IOPS statement based on 4K sector size; Random WRITE workloads measured using FIO with a queue depth of 128).
14. Latency values measured with random workloads using FIO, 4KB transfers, queue depth = 1; TYP = median, 50th percentile.
15. Actual lifetime will vary by workload. Total bytes written are calculated assuming the drive is 100% full (user capacity) with a 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.

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