

Micron 4600 SSD: PCIe® Gen5 performance and best-in-class user experience

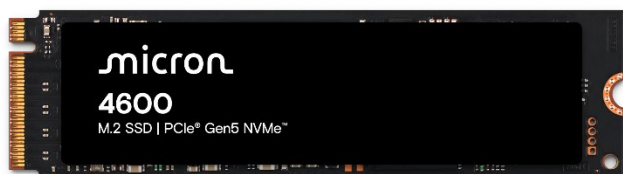
Micron's leading PCIe® Gen5 client SSD enables outstanding performance¹ and a best-in-class user experience.² It easily manages the most demanding professional applications, significantly improves AI model load times, and excels in high-speed gaming.

Level up to PCIe Gen5 storage: The Micron 4600 SSD offers significant PCIe Gen5 performance improvements over the prior generation of PCIe Gen4 performance SSDs, with up to double the bandwidth.

Realize best-in-class user experience: The Micron 4600 SSD leads the pack with superior PCMark®10 user experience benchmark scores. This SSD delivers class-leading results for professional applications in life sciences, medical research, scientific computing, media and entertainment, product development, the energy industry, and content creation.

Enhance SSD security: Equipped with Security Protocol and Data Model (SPDM), Data Object Exchange (DOE), and Device Identifier Composition Engine (DICE), the Micron 4600 SSD enables identity verification and drive integrity. These standards help ensure that the SSD is a trusted device and that its firmware is untampered.³

Achieve superior energy efficiency: Delivering superior energy efficiency (in MB/s per watt) when compared to prior-generation PCIe Gen4 performance-focused SSDs, the Micron 4600 can help extend battery life and reduce power consumption.



Micron 4600 NVMe SSD (22 x 80mm, 512GB to 4TB)

Micron 4600 SSD Key Benefits

Achieve peak performance

The Micron 4600 SSD delivers on the potential of PCIe Gen5 by outpacing prior-generation PCIe Gen4 performance-focused SSDs, showing up to:

- 107% faster sequential read speed: 14.5 GB/s
- 71% faster sequential write speed: 12.0 GB/s
- 83% higher random read speed: 2,100 KIOPS
- 83% higher random write speed: 2,100 KIOPS
- 61% faster AI (LLM) model loading

Elevate user experience

As Micron's second SSD with leading G9 TLC NAND,⁴ the Micron 4600 SSD builds on this robust and proven technology to deliver best-in-class user experience with up to 11% better PCMark®10 benchmark scores versus Gen5 competitors. It also shows better results for life sciences, media and entertainment, product development, and the energy industry compared to prior-generation PCIe Gen4 performance-focused SSDs:⁵

- Life sciences, medical, and scientific: up to 38% better
- Media and entertainment: up to 61% better
- Product development applications: up to 45% better
- Energy industry applications: up to 59% better

The Micron 4600 SSD is the class leader in user experience. It offers superior performance and demonstrates better energy efficiency than prior-generation PCIe Gen4 performance-focused SSDs. It is the ideal SSD for the most demanding uses, like gaming and professional applications.

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1. Performance and LLM load time statements are based on 2TB PCIe Gen5 Micron 4600 SSD compared to 2TB PCIe Gen4 Micron 3500 SSD (unformatted capacity; 1GB = 1 billion bytes; formatted capacity will be less) internal testing of random (IOPS) and sequential (MB/s) results. LLM load time improvements based on Micron testing use Llama-2-13b, a 13 billion parameter model. See <https://huggingface.co/TheBloke/Llama-2-13B-GGUF> for additional information on this LLM.
2. Class refers to publicly announced client SSDs from suppliers with at least 10% client OEM SSD revenue share, excluding Apple® and gaming consoles, as noted in Forward Insights analyst report: SSD Supplier Status Q3/24 November 2024. User experience statement refers to PCMark®10 benchmark scores for the SSDs noted in this report. See <https://benchmarks.ul.com/pcmark10> for additional information on this benchmark.
3. See <https://www.dmf.org/standards/SPDM> for additional details on SPDM. See <https://members.pcisig.com/wg/PCI-SIG/document/18483?uploaded=1> for additional details on DOE. See <https://trustedcomputinggroup.org/work-groups/dice-architectures/> for additional information on DICE. No 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.
4. See <https://investors.micron.com/news-releases/news-release-details/micron-announces-volume-production-ninth-generation-nand-flash> for additional information on Micron G9 NAND.
5. Improvements based on 2TB PCIe Gen5 Micron 4600 SSD compared to 2TB PCIe Gen4 Micron 3500 SSD SPECwpcSM benchmark results. See https://www.spec.org/gwpg/wpc.static/wpc_overview.html for more information about this benchmark.

Micron’s leading PCIe® Gen5 client SSD

The Micron 4600 SSD is built for the most demanding professional applications. It delivers SPECwpcSM benchmark results for a superior user experience when compared to prior-generation PCIe Gen4 performance-focused SSDs⁶ across a broad range of demanding applications:

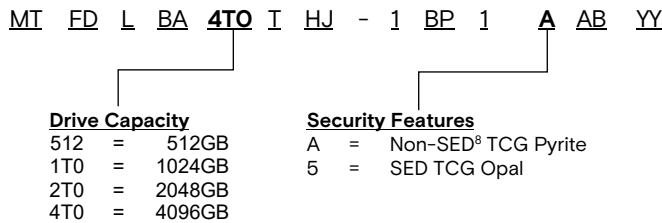
Professional Application	Micron 4600 SSD Advantage
Genomic sequencing and analysis, molecular dynamics simulations, and medical imaging	Up to 38%
Video editing / post-production, 3D animation, rendering, and graphic design	Up to 61%
Finite element analysis for biomechanics, 3D modeling for drug delivery, and virtual prototyping for medical equipment	Up to 45%
Analytics for environmental monitoring, bio-systems simulation, and healthcare facilities energy use analysis	Up to 59%

Peak SSD performance with the world’s latest Micron G9 NAND

The Micron 4600 SSD, being the second Micron SSD to incorporate G9 TLC NAND, continues to lead the industry by adopting the latest NAND nodes, while competitors still rely on older technologies.⁷

SSD	Industry NAND Generation
Micron 4600 SSD	Gen 9
Competitor A	Gen 8
Competitor B	Gen 8

Micron 4600 SSD part numbers



Micron 4600 NVMe SSD

Category	Performance PCs and Notebooks			
Model	Micron 4600 SSD			
Form Factor	M.2 (22 x 80mm)			
Interface	PCIe Gen5, NVMe 2.0c			
Capacities	512GB	1TB	2TB	4TB
Sequential Read (MB/s) ⁹	10,300	14,500	14,500	14,500
Sequential Write (MB/s) ⁹	5,780	11,500	12,000	12,000
Random Read (KIOPS) ¹⁰	800	1,600	2,100	2,100
Random Write (KIOPS) ¹⁰	1,200	2,100	2,100	2,100
Read Latency (TYP) ¹¹	50µs	50µs	50µs	50µs
Write Latency (TYP) ¹¹	12µs	12µs	12µs	12µs
Endurance (TBW)	300TB	600TB	1,200TB	1,600TB
MTTF (Million Hours)	2	2	2	2
Sleep/PS4 Power (mW)	<3.5	<3.5	<3.5	<3.5
Active Idle Power (mW)	<150	<150	<150	<150
PCIe Gen5 Active Read Power (mW)	<8250	<8250	<8,250	<8,500
Advanced Features	Micron G9 TLC NAND Hardware-based AES 256-bit encryption ¹² Power-loss protection (data at rest) Host-controlled thermal management Performance enhancing accelerated caching Thermal S.M.A.R.T. via SMBus Basic management commands Firmware activate without reset Sanitize block and crypto erase Power-loss signal support TCG Opal 2.02, TCG Pyrite 2.01, SPDM, DOE, DICE Micron Storage Executive management tool			

6. Improvements based on 2TB PCIe Gen5 Micron 4600 SSD compared to 2TB PCIe Gen4 Micron 3500 SSD SPECwpcSM benchmark results. See https://www.spec.org/gwpg/wpc.static/wpc_overview.html for more information about this benchmark.

7. NAND technology statements based on public information at the time of this product launch. Competitors are Samsung PM9E1 and SK Hynix PCB01.

8. SED = self-encrypting drive.

9. Sequential workloads measured at the fresh-out-of-box (FOB) state (see <https://www.snia.org/education/online-dictionary/term/fob> for details); SSD unformatted; SSD write cache enabled; NVMe power state 0; measured using FIO with a 128KB transfer size and a queue depth of 32.

10. Random workloads measured at FOB; SSD unformatted; SSD write cache enabled; NVMe power state 0; measured using FIO with a 4KB transfer size and a queue depth of 128.

11. TYP refers to typical values (median, 50th percentile). Read/write latency measured using a 4KB transfer size and a queue depth of 1.

12. No 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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