Micron 3610 NVMe SSD: Excellent performance and user experience for mainstream computing

The Micron® 3610 NVMe™ SSD is the industry's first PCIe® Gen5 QLC client SSD, powered by Micron G9 NAND. Designed for mainstream PCs and notebooks, it delivers exceptional throughput, energy efficiency, and enhanced security—ideal for PCIe Gen5 performance upgrades.

Excellent performance

With sequential performance of up to 11 GB/s, this solution allows for rapid data access and enhanced system responsiveness. It is capable of loading 20 billion-parameter AI models in less than three seconds, delivering real-time AI insights and high-quality experience for mainstream client devices.

Micron G9 QLC NAND

Built on Micron's ninth-generation QLC technology—the industry's first 2Tb QLC NAND die—the 3610 SSD offers exceptional density and bandwidth. Its ONFI 5.0 interface supports speeds up to 3.6 GT/s, ensuring high throughput for demanding workloads.

Superior energy efficiency

The 3610 SSD combines Host Controlled Thermal Management (HCTM), Host Memory Buffer (HMB), and Micron Adaptive Write Technology (AWT).[2] Its DRAM-less architecture helps to extend battery life and reduce power consumption without compromising performance.

User experience benchmarks

The 3610 SSD offers strong PCMark®10 scores and bandwidth, making it ideal for various industry workloads. Its solid 3DMark® score also supports adequate gaming performance.[3]

Key benefits

The Micron 3610 SSD leverages PCIe Gen5 for improved performance over previous PCIe Gen4 QLC and TLC SSDs, offering:

- Sequential read: 11 GB/s
- Sequential write: 9.3 GB/s
- Random read: 1.5M IOPS
- Random write: 1.6M IOPS
- 24% faster AI (LLM) model loading

Excellent performance per watt

Delivering superior energy efficiency (in MB/s per watt) at sequential read and write when compared to prior-generation PCIe Gen4 TLC and PCIe Gen4 QLC solutions, the Micron 3610 can help extend battery life and reduce power consumption. It provides up to 43% improvement on performance per watt.[1]

Enhanced SSD security

Featuring Device Identifier Composition Engine (DICE) and Data Object Exchange (DOE),[4] the 3610 SSD provides robust identity verification and drive integrity. These protocols ensure the SSD is a trusted device and its firmware is untampered.

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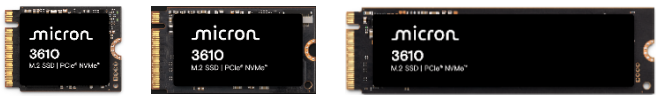

Figure 1: Micron 3610 NVMe SSD (22mm x 80mm, 22mm x 42mm and 22mm x 30mm, 1TB to 4TB)

1. Performance, power efficiency, benchmark and AI model loading time statements are based on 2TB PCIe Gen5 Micron 3610 SSD compared to 2TB PCIe Gen4 Micron 3500 TLC SSD and 2TB PCIe Gen4 Micron 2600 QLC SSD, tested in Micron labs.
2. Micron AWT manages how a QLC SSD writes data to the NAND to help deliver the performance of SLC and TLC with the economics of QLC. Results are based on the volume and rate of data being written, the SSD capacity, how the SSD is used, and a host of other factors. Micron AWT adjusts among different NAND "modes" (SLC, TLC and QLC) depending on demand.
3. User experience statements refer to benchmark results using the PCMark 10 Full System Drive and 3D Mark benchmarks (testing conducted in Micron labs on SSDs. For additional information on the PCMark 10 Full System Drive Benchmark, see https://support.benchmarks.ul.com/support/solutions/articles/44002171465. For additional information on the 3D Mark benchmark, see https://benchmarks.ul.com/3dmark.
4. See https://trustedcomputinggroup.org/work-groups/dice-architectures/ for additional information on DICE. See https://members.pcisig.com/wg/PCI-SIG/document/18483?uploaded=1 for additional details on DOE. 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.

Exellent storage performance

Micron 3610 SSD performance improvement[5]		
	Micron 3610 SSD advantage	
Performance type	vs. Gen4 QLC	vs. Gen4 TLC
Sequential read (SR)	Up to 57%	Up to 56%
Sequential write (SW)	Up to 45%	Up to 37%

Table 1: Public performance information comparison

Unmatched user experience

Micron 3610 SSD benchmark improvement[5]		
Benchmark	Micron 3610 SSD advantage	
	vs. Gen4 QLC	vs. Gen4 TLC
PCMark 10		
Score	Up to 30%	Up to 19%
Bandwidth (MB/s)	Up to 28%	Up to 19%
3DMark score	Up to 20%	Up to 10%

Table 2: User experience benchmark comparison

Superior performance per watt

Micron 3610 SSD performance per watt improvement[5]		
Performance type	Micron 3610 SSD advantage	
	vs. Gen4 QLC	vs. Gen4 TLC
SR performance vs. power	Up to 10%	Up to 43%
SW performance vs. power	-	Up to 27%

Table 3: Performance per watt comparison

Micron 3610 NVMe SSD			
Category	Mainstream PCs and notebooks		
Model	Micron 3610 SSD		
Form factor	M.2 (22mm x 30mm, 22mm x 42mm, 22mm x 80mm)		
Interface	PCIe Gen5, NVMe 2.0d		
Capacities	1TB	2TB	4TB
Sequential read (MB/s)[7]	11,000	11,000	11,000
Sequential write (MB/s)[7]	7,200	9,300	9,300
Random read (KIOPS)[8]	850	1,500	1,500
Random write (KIOPS)[8]	1,500	1,600	1,600
Read latency (TYP)[9] (µs)	50	50	50
Write latency (TYP) (µs)	12	12	12
Endurance (TBW)	400	800	1600
MTTF (million hours)	2	2	2
Sleep/PS4 power (mW)	<2.5	<2.5	<2.5
Active idle power (mW)	<150	<150	<150
Active read power (mW)	<6,500	<6,500	<6,500

Advanced features
Micron G9 QLC NAND
Hardware-based AES 256-bit encryption[10]
Power-loss protection (data at rest)
Host-controlled thermal management (HCTM)
Performance-enhancing Micron AWT
Thermal S.M.A.R.T. via SMBus
Basic management commands (BMC)
FW activate without reset
Sanitize block and crypto erase
Power-loss signal support
TCG Opal 2.02, TCG Pyrite 2.01, DOE, DICE
Micron Storage Executive SSD management tool

Micron 3610 SSD part numbers

MT FD L **BA** **2T0** Q HT - 1 BQ 1 **A** AB YY

Drive form factor
BA = M.2 (22mm x 80mm)
BK = M.2 (22mm x 30mm)

Drive Capacity
1T0 = 1024GB
2T0 = 2048GB
4T0 = 4096GB

Security Features
A = Non-SED[6] TCG Pyrite
5 = SED TCG Opal

5. Performance and benchmark improvements calculated as (Micron 3610 value/Gen4 SSD value) – 1, expressed as a percentage.
6. SED = self-encrypting drive. 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.
7. 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.
8. Random workloads measured at FOB, SSD unformatted, write cache enabled, NVMe power state 0. Measured using FIO with a 4KB transfer size and a queue depth of 32.
9. TYP refers to typical values. Read/write latency measured using a 4KB transfer size, queue depth 1.
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