

# Best-in-class user experience and performance for everyday computing<sup>1</sup>



Micron is the first to ship the industry's ninth-generation (G9) 3D NAND in a production SSD. This innovative G9 NAND helps ensure that the Micron® 2650 SSD provides a best-in-class user experience for everyday computing with performance that beats competitive client SSDs.<sup>2</sup>

## World's fastest NAND fosters improved SSD user experience

High-performance NAND with the industry's leading 3,600 MT/s IO (up to 50% higher IO speed than competitors' products now shipping)<sup>3</sup> along with six-plane, independent word line architecture drives superior SSD application performance.

## SSD delivers more productivity for your daily applications

Best-in-class user experience benchmark results and accelerated caching for enhanced write performance, combined with a broad range of form factors and capacity options bring the benefits of the Micron 2650 SSD to more platforms and more users.

## Class-leading performance speeds everyday computing

The Micron 2650 SSD reaches up to 7,000 MB/s read speed to meet your everyday computing needs.



Micron 2650 NVMe SSD

## Micron 2650 SSD key benefits

### The world's first client SSD in production with ninth-generation 3D NAND

Industry-leading NAND brings technological breakthroughs that help improve user experience and SSD performance:

- **Best-in-class IO speed**

An impressive ONFI rate up to 3,600 MT/s that is up to 50% faster than competing NAND.<sup>4</sup>

- **Six-plane NAND architecture**

Industry-leading six-plane TLC NAND has the most planes per die of any TLC flash to help improve parallelism and simultaneous read/write commands support.

### Best-in-class user experience for everyday computing

By outperforming all its TLC and QLC competitors, the Micron 2650 SSD offers best-in-class storage performance built for everyday computing.

### Best-in-class SSD performance

The Micron 2650 offers class-leading performance including:

- Up to 70% better sequential read
- Up to 103% better sequential write
- Up to 156% better random read
- Up to 85% better random write

[micron.com/2650](https://micron.com/2650)

1. Class refers to currently-in-production client SSDs from the top five client suppliers (excluding consoles) by revenue as of May 2024, as noted in Forward Insights' analyst report, "SSD Supplier Status Q1/24 May 2024" in the Total Client tab. User experience refers to PCMark® 10 Full System Drive benchmark scores as measured by Micron Engineering in Micron test labs. See <https://benchmarks.ul.com/pcmark10> for additional information on this benchmark. Performance refers to public information available at the time of this document's publication.
2. Micron announced shipment of 9th generation NAND (G9) with the Micron 2650 NVMe, a first for industry 9th generation NAND. Micron was previously first to announce the industry's 7th and 8th gen NAND shipping in an SSD in 2020 and 2022 respectively and now is first to ship again per footnote 1. Performance refers to random read and write IOPS and sequential read and write throughput performance statements. All performance statements are based on publicly available information available at the time of this document's publication vs. SSD competitors per footnote 1. User experience statements refer to PCMark 10 benchmark scores. See <https://benchmarks.ul.com/pcmark10> for details on this benchmark.
3. The Micron 2650 SSD NAND transfer rate is up to 3,600 MT/s compared to 2,400 MT/s for competitors SK Hynix, Solidigm, Kioxia, Western Digital, and Samsung as of the date of this document's publication.
4. Competitor's NAND refers to SK Hynix, Solidigm, Kioxia, Western Digital, and Samsung.

Superior user experience

The Micron 2650 SSD has best-in-class user experience compared to TLC NAND-based competitors’ SSDs as shown by PCMark 10 benchmark results. It is available in three compact, single-sided M.2 form factors with capacities up to 1TB for wide-ranging flexibility.

| PCMark 10           | Micron 2650 SSD improvement <sup>5</sup> |
|---------------------|------------------------------------------|
| Average access time | Up to 40% better                         |
| Average score       | Up to 38% better                         |
| Average bandwidth   | Up to 36% better                         |

PCMark 10 performance comparisons

Serious performance

The Micron 2650 reaches up to 7,000 MB/s sequential read – delivering superior overall performance that beats the competition.

| Micron 2650 SSD performance improvement <sup>6</sup> |                             |
|------------------------------------------------------|-----------------------------|
| Performance type                                     | Performance vs. competitors |
| Sequential read                                      | Up to 70% better            |
| Sequential write                                     | Up to 103% better           |
| Random read                                          | Up to 156% better           |
| Random write                                         | Up to 85% better            |

Public performance information comparison

**Micron 2650 SSD part numbers**

MT FD K **BA 512** T GW- 1 BK 1 **A** AB YY

**Drive form factor**

BA = M.2 (22mm x 80mm)  
CD = M.2 (22mm x 42mm)  
BK = M.2 (22mm x 30mm)

**Security features**

A = Non-SED<sup>10</sup> TCG Pyrite  
5 = SED TCG Opal

**Drive capacity**

256 = 256GB  
512 = 512GB  
1T0 = 1024GB

| Micron 2650 NVMe SSD                 |                                       |        |        |
|--------------------------------------|---------------------------------------|--------|--------|
| Category                             | Everyday use for PCs and notebooks    |        |        |
| Model                                | Micron 2650 SSD                       |        |        |
| Form factor                          | M.2 (22 x 30mm, 22 x 42mm, 22 x 80mm) |        |        |
| Interface                            | PCIe Gen4, NVMe 1.4c                  |        |        |
| Capacities <sup>7</sup>              | 256GB                                 | 512GB  | 1TB    |
| Sequential read (MB/s) <sup>8</sup>  | 5,000                                 | 7,000  | 7,000  |
| Sequential write (MB/s) <sup>8</sup> | 2,500                                 | 4,800  | 6,000  |
| Random read (KIOPS) <sup>9</sup>     | 370                                   | 740    | 1,000  |
| Random write (KIOPS) <sup>9</sup>    | 500                                   | 1,000  | 1,000  |
| Read latency (TYP) <sup>10</sup>     | 50µs                                  | 50µs   | 50µs   |
| Write latency (TYP) <sup>10</sup>    | 12µs                                  | 12µs   | 12µs   |
| Endurance (TBW)                      | 200TB                                 | 300TB  | 600TB  |
| MTTF (million hours)                 | 2                                     | 2      | 2      |
| Sleep/PS4 power (mW)                 | <2.5                                  | <2.5   | <2.5   |
| Active idle power (mW)               | <150                                  | <150   | <150   |
| PCIe Gen4 active read power (mW)     | <6,100                                | <6,100 | <6,100 |

- Advanced features**
- Micron 3D 276-layer TLC NAND
  - Hardware-based AES 256-bit encryption<sup>11</sup>
  - 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 (BMC)
  - Firmware activate without reset
  - Sanitize block and crypto erase
  - Power-loss signal support
  - TCG Opal 2.02, TCG Pyrite 2.01
  - Micron Storage Executive SSD management tool

5. Improvements calculated as ((Micron 2650 score) / (competitor score) – 1), expressed as a percentage. Advertised capacity of 1TB used for comparisons due to limited 512GB and 2TB advertised capacity competitors’ SSDs.

6. Statements refer to public information available at the time of this document’s publication for the SSDs in footnote 1. Micron 2650 improvements calculated as noted in footnote 5.

7. Unformatted capacity. 1GB = 1 billion bytes; formatted capacity will be less. 256GB version available later.

8. 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, write cache enabled, NVMe power state 0. Measured using Flexible I/O (FIO) tester with a 1MB transfer size and a queue depth of 32 (see <https://fio.readthedocs.io/en/latest/index.html> for additional information on this benchmark).

9. 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 128.

10. TYP refers to typical values. Read/write latency measured using a 4KB transfer size, queue depth 1.

11. 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.

[micron.com/2650](https://micron.com/2650)

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