Micron 9400 SSD Series Technical Product Specification

For additional technical and warranty information, contact your Micron sales representative.
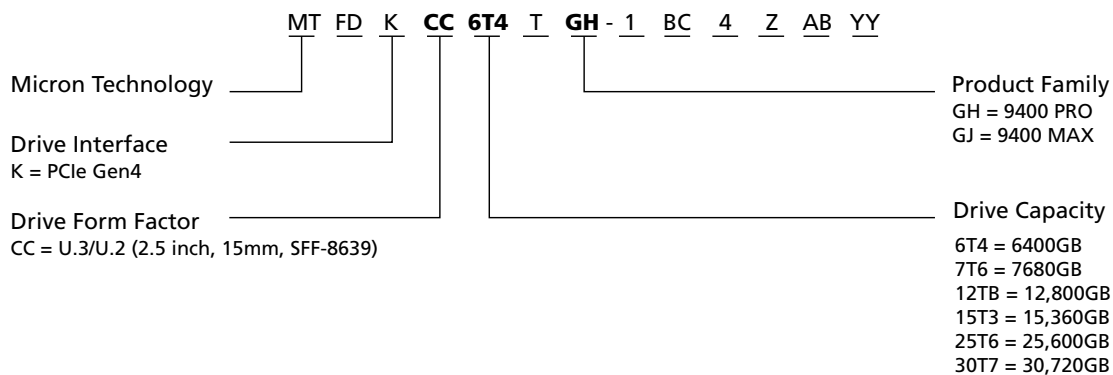
Features

- Micron®3D TLC NANDFlash
- PCI Express Gen4
  - U.3/U.2 single port (x4)
- NVM Express 1.4
  - Number of name spaces supported: 128
  - Weighted round robin with urgent arbitration supported
- Capacity (unformatted)
  - PRO: 7680GB, 15,360GB, 30,720GB
  - MAX: 6400GB, 12,800GB, 25,600GB
- Endurance: Total bytes written (TBW)
  - 6400GB: 35,040TB
  - 7680GB: 14,016TB
  - 12,800GB: 70,080TB
  - 15,360GB: 28,032TB
  - 25,600GB: 140,160TB
  - 30,720GB: 56,064TB
- Enterprise sector size support = 512 and 4096-byte sector size (configurable)
- Security: Digitally signed firmware
- Surprise insertion/surprise removal (SISR) and hot-plug capable
- Self-monitoring, analysis, and reporting technology (SMART)

- Performance[1]
  - Sequential 128KB READ: Up to 7000 MB/s
  - Sequential 128KB WRITE: Up to 7000 MB/s
  - Random 4KB READ: Up to 1,600,000 IOPS
  - Random 4KB WRITE: Up to 600,000 IOPS
- Latency[2, 3]
  - READ (TYP): 69μs
  - WRITE (TYP): 10μs
- Reliability
  - MTTF: 2 million device hours[4]
  - Static and dynamic wear leveling
  - Uncorrectable bit error rate (UBER): <1 sector per 10^{17} bits read
  - End-to-end data protection
  - Full power-loss protection
- Operating temperature[5]
  - Commercial (0°C to +70°C)
- Field upgradeable firmware
- Form factor
  - U.3/U.2: 100.45 x 70.10 x 15.00mm
- Electrical specification
  - Power supply: 12V ±8%
  - AUX supply: 3.3V ±5%

Notes: 1. Steady state as defined by SNIA Solid State Storage Performance Test Specification Enterprise v1.1.
2. 4KB, queue depth 1 transfers used for READ/WRITE latency values.
3. TYP: Median, 50th percentile
4. Product achieves MTTF based on population statistics not relevant to individual units.
5. Temperature measured by SMART.

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Part Numbering Information

Micron 9400 SSDs are available in different configurations and capacities. The chart below is a comprehensive list of options; not all options listed can be combined to define an offered product. Visit www.micron.com for a list of valid part numbers.

Figure 1: Part Number Chart

MT FD K **CC** **6T4** T **GH** - 1 BC 4 Z AB YY

Micron Technology

Drive Interface
K = PCIe Gen4

Drive Form Factor
CC = U.3/U.2 (2.5 inch, 15mm, SFF-8639)

Product Family
GH = 9400 PRO
GJ = 9400 MAX

Drive Capacity
6T4 = 6400GB
7T6 = 7680GB
12TB = 12,800GB
15T3 = 15,360GB
25T6 = 25,600GB
30T7 = 30,720GB

Important Notes and Warnings

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Critical Applications. Products are not authorized for use in applications in which failure of the Micron component could result, directly or indirectly in death, personal injury, or severe property or environmental damage ("Critical Applications"). Customer must protect against death, personal injury, and severe property and environmental damage by incorporating safety design measures into customer's applications to ensure that failure of the Micron component will not result in such harms. Should customer or distributor purchase, use, or sell any Micron component for any critical application, customer and distributor shall indemnify and hold harmless Micron and its subsidiaries, subcontractors, and affiliates and the directors, officers, and employees of each against all claims, costs, damages, and expenses and reasonable attorneys' fees arising out of, directly or indirectly, any claim of product liability, personal injury, or death arising in any way out of such critical application, whether or not Micron or its subsidiaries, subcontractors, or affiliates were negligent in the design, manufacture, or warning of the Micron product.

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Limited Warranty. In no event shall Micron be liable for any indirect, incidental, punitive, special or consequential damages (including without limitation lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort, warranty, breach of contract or other legal theory, unless explicitly stated in a written agreement executed by Micron's duly authorized representative.

Performance

Measured performance can vary for a number of reasons. The major factors affecting drive performance are the capacity of the drive and the interface of the host. Additionally, overall system performance can affect the measured drive performance. When comparing drives, it is recommended that all system variables are the same, and only the drive being tested varies.

Performance numbers will vary depending on the host system configuration.

Table 1: Drive Performance – PRO

Parameter: Power State 0	7680GB	15,360GB	30,720GB	Unit
Sequential READ (128KB transfer)	7000	7000	7000	MB/s
Sequential WRITE (128KB transfer)	7000	7000	7000	MB/s
Random READ (4KB transfer)	1600	1600	1500	KIOPS
Random WRITE (4KB transfer)	300	300	300	KIOPS
70/30 Random READ/WRITE (4KB transfer)	770	780	770	KIOPS
READ Latency (TYP)	69	69	69	us
WRITE Latency (TYP)	10	10	10	us
READ Latency (99%)	85	85	85	us
WRITE Latency (99%)	30	30	30	us

Table 2: Drive Performance – MAX

Parameter: Power State 0	6400GB	12,800GB	25,600GB	Unit
Sequential READ (128KB transfer)	7000	7000	7000	MB/s
Sequential WRITE (128KB transfer)	7000	7000	7000	MB/s
Random READ (4KB transfer)	1600	1600	1500	KIOPS
Random WRITE (4KB transfer)	600	600	550	KIOPS
70/30 Random READ/WRITE (4KB transfer)	930	940	900	KIOPS
READ Latency (TYP)	69	69	69	us
WRITE Latency (TYP)	10	10	10	us
READ Latency (99%)	85	85	85	us
WRITE Latency(99%)	30	30	30	us

Notes: 1. Performance values 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 256
- Random WRITE workloads measured using FIO with a queue depth of 128
2. Performance values measured with the following system configuration:
- Generic X570 Motherboard
- AMD Ryzen 7 3700X 8-Core CPU @ 2.6 GHz
- DDR4 16GB @ 3200 MHz
3. Latency values measured under the following configuration:
- Random workloads using FIO with 4KB transfers and a queue depth of 1
- TYP = median, 50th percentile
4. System variations will affect measured results.

Endurance

While actual endurance varies depending on conditions, the drive lifetime can be estimated based on capacity, assumed fixed-use models, ECC, and formatted sector size.

Lifetime estimates for the device are shown in the following tables in total bytes written.

Table 3: Total Bytes Written

Model	Capacity (GB)	4K Random Total Bytes Written (TB)	128K Sequential Total Bytes Written (TB)
PRO	7680	14,016	58,300
	15,360	28,032	104,500
	30,720	56,064	201,200
MAX	6400	35,040	74,200
	12,800	70,080	143,100
	25,600	140,160	282,600

Notes: 1. Values represent the theoretical maximum endurance for the given transfer size and type. Actual lifetime will vary by workload. Refer to Percentage Used in the SMART/Health Information (Log Identifier 02h) to check the device life used.
2. Total bytes written assuming drive is 100% full (user capacity) with workload of 100%random aligned 4KB and 100% sequential 128K Writes.

Electrical Characteristics

Table 4: Power Consumption – PRO

Parameter: Power State 0	7680GB	15,360GB	30,720GB	Unit
Active READ (maximum RMS)	17	18	21	W
Active Write (maximum RMS)	22	25	25	W
128K Sequential READ (average RMS)	11	13	14	W
128K Sequential WRITE (average RMS)	15	20	17	W
4K Random READ (average RMS)	13	15	16	W
4KB Random WRITE (average RMS)	17	19	18	W
4KB 70/30 Random READ/WRITE (average RMS)	17	18	18	W
Idle (average RMS)	5	5	5	W

Table 5: Power Consumption – MAX

Parameter: Power State 0	6400GB	12,800GB	25,600GB	Unit
Active READ (maximum RMS)	16	18	21	W
Active Write (maximum RMS)	22	25	25	W
128K Sequential READ (average RMS)	11	16	14	W
128K Sequential WRITE (average RMS)	15	13	17	W
4K Random READ (average RMS)	13	15	16	W
4KB Random WRITE (average RMS)	16	17	18	W
4KB 70/30 Random READ/WRITE (average RMS)	14	15	17	W
Idle (average RMS)	5	5	5	W

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Table 6: Operating Voltage – U.3/U.2

Power Rail	Elecrical Parameter	Value
12V	Operating voltage	12 Vdc (±8%)
	MIN/MAX rise time	0.1ms/100ms
	Fall time	<5s
	MIN power-off time	50ms
	Inrush current (typical peak)	2.0A
3.3V$_{AUX}$	Operating voltage	3.3 Vdc (±5%)
	MIN/MAX rise time	1ms/50ms
	MIN/MAX fall time	1ms/5s
	MAX average current	20mA

Physical Configuration

U.3/U.2 Enterprise PCIe

Product mass: less than 235g for U.3 15mm.

Figure 2: U.3/U.2 15mm Nominal Dimensions – 16TB/32TB Capacity Point View
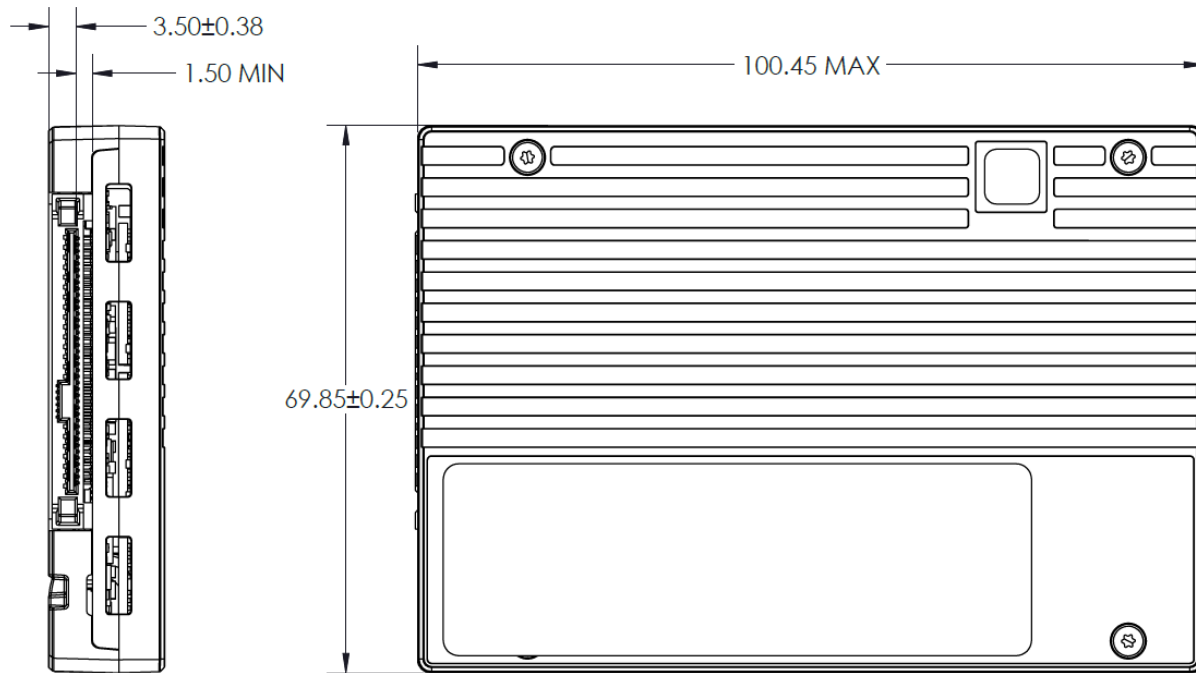
Note: 1. All dimensions are in millimeters.

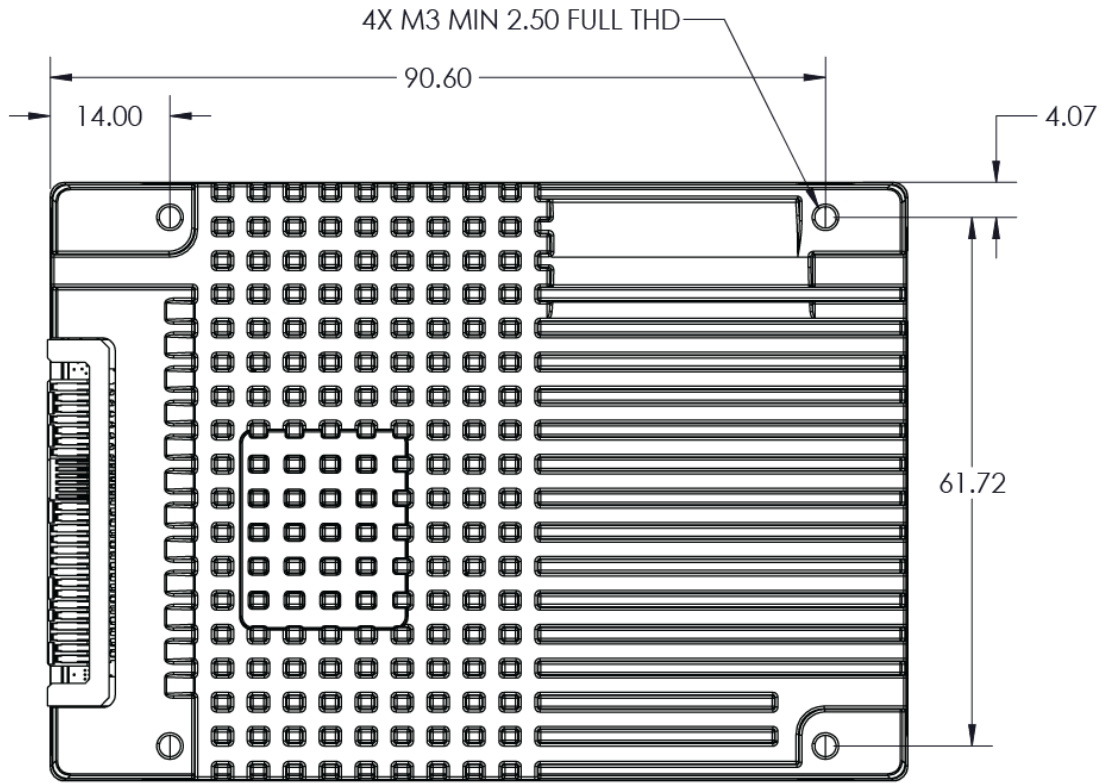**Figure 3: U.3/U.2 15mm Nominal Dimensions – 8TB Capacity Point View**
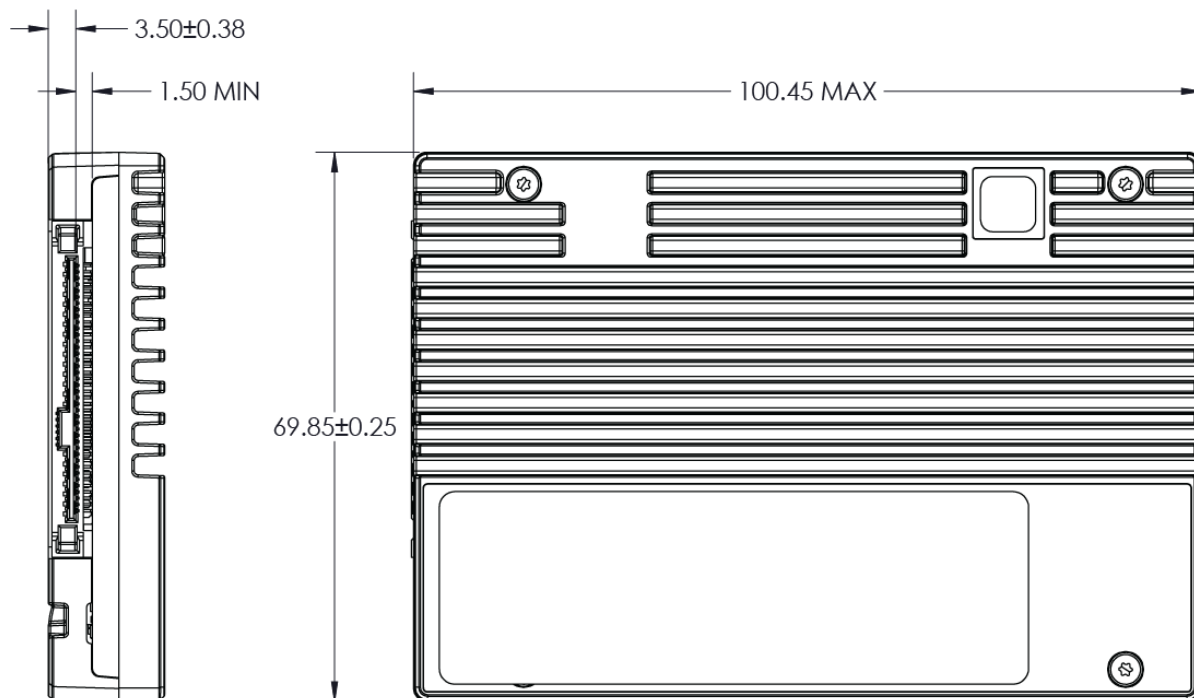
Note: 1. All dimensions are in millimeters.

Figure 4: U.3/U.2 15mm Nominal Dimensions 16TB/32TB – Side View
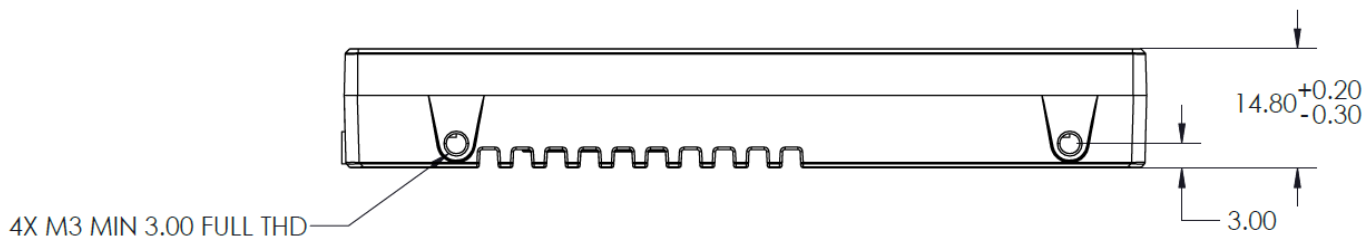
Note: 1. All dimensions are in millimeters.

Figure 5: U.3/U.2 15mm Nominal Dimensions 16TB/32TB and 8TB – Bottom View

Note: 1. All dimensions are in millimeters.

Compliance

Micron SSDs comply with the following:

- Micron Green Standard
- Built with sulfur-resistant resistors
- CE (Europe): EN55032, EN55024 Class A, RoHS
- FCC: CFR Title 47, Part 15, Class A
- UL/cUL: approval to UL-60950-1, 2nd Edition, IEC 60950-1:2005 (2nd Edition); EN 60950-1 (2006) + A11:2009+ A1:2010 + A12:2011 + A2:2013
- BSMI (Taiwan): approval to CNS 13438, Class A, CNS 15663
- RCM (Australia, New Zealand): AS/NZS CISPR32 Class A
- KC RRL (Korea): approval to KN32 Class A, KN 35 Class A
  A급 기기   이 기기는 가정용으로 전자파적합등록을한 기기로서 주거

  (가정용 정보통신기기) 지역에서는 물론 모든지역에서 사용할 수 있습니다.

- W.E.E.E.: Compliance with EU WEEE directive 2012/19/EC. Additional obligations may apply to customers who place these products in the markets where WEEE is enforced.
- TUV (Germany): approval to IEC60950/EN60950
- V_{CCI} (Japan): 2015-04 Class A
  この装置は、クラス A 情報技術装置です。この装置は、家庭環境で使用することを目
  的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、
  受信障害を引き起こすことがあります。
  取扱説明書に従って正しい取り扱いをして下さい。
  VCCI－A
- IC (Canada): ICES-003 Class A
  - This Class A digital apparatus complies with Canadian ICES-003.
  - Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
- Morocco: EN55032, EN55024 Class A
- UkrSEPRO (Ukraine): EN55032 Class A, IEC60950/EN60950, RoHS (Resolution 2017 No. 139)

- UKCA (UK): SI 2016/1091 Class A and SI 2012/3032 RoHS

Revision History

Rev. B – 4/2025

- Typo correction

Rev. A – 5/2023

- Initial release