

Micron XTR SSD Series

Technical Product Specification

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

Features

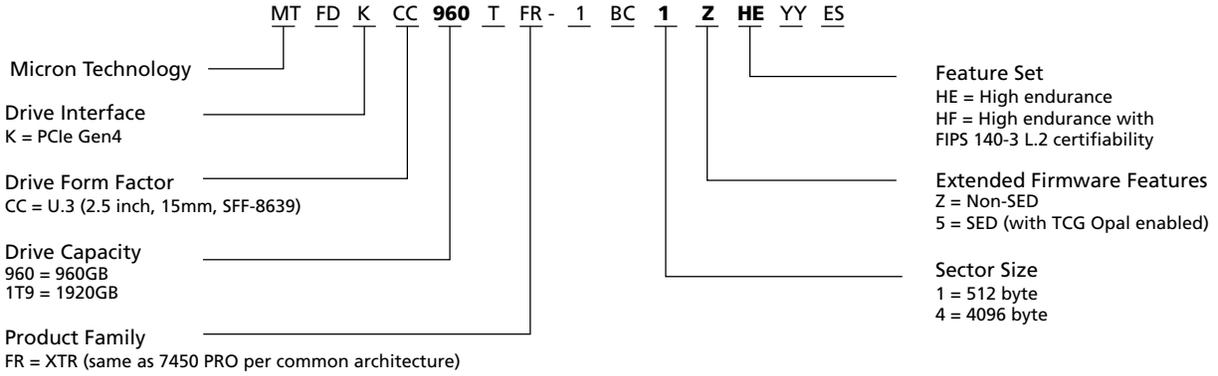
- Micron®3D TLC NAND Flash
- PCI Express Gen4
 - U.3 single port (x4) backwards-compatible with U.2
- NVM Express
 - Number of name spaces supported: 132
 - Weighted round robin with urgent arbitration supported
- Capacity (unformatted)
 - U.3: 960GB, 1920GB
- Endurance: Total bytes written (TBW)
 - Up to 210,000TB at 60 sequential DDPD
 - Up to 125,000TB at 35 random DDPD
- Enterprise sector size support = 512 and 4096-byte sector size (configurable)
- Security
 - Digitally signed firmware
 - FIPS 140-3 L.2 certificate
 - TAA-compliant SKUs
 - Self-encrypting drive (SED) SKUs
 - SPDM 1.1 specification
 - Isolated security environment
 - Micron enterprise security suite
 - Hardware root of trust and chain of trust
 - TCG device identifier composition engine (DICE)
 - Secure hash SHA-512 (also supports SHA-384 and SHA-256)
 - RSA key size and signature scheme 3K/4K
- Surprise insertion/surprise removal (SISR) and hot-plug capable
- Self-monitoring, analysis, and reporting technology (SMART)
- Field upgradeable firmware with support for activate without reset
- Performance¹
 - Sequential 128KB READ: Up to 6800 MB/s
 - Sequential 128KB WRITE: Up to 5600 MB/s
 - Random 4KB READ: Up to 900,000 IOPS
 - Random 4KB WRITE: Up to 350,000 IOPS
- Latency^{2, 3}
 - READ (TYP): 60µs
 - WRITE (TYP): 15µs
- Reliability
 - MTTF: 2.0M hours @0-55°C and 2.5M hours @ 0-50°C⁴
 - Static and dynamic wear leveling
 - Uncorrectable bit error rate (UBER): <1 sector per 10¹⁷ bits read
 - OCP 1.0a compliant end-to-end data protection
 - Enterprise power-loss protection
- Operating temperature⁵
 - Commercial (0°C to +70°C)
- Form factor
 - U.3: 100.45 x 70.10 x 15.00mm
- Electrical specification
 - U3 power supply: 12V ±10%
 - U3 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.

Part Numbering Information

Micron XTR 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



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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

Parameter: Power State 0		U.3		Unit
		960GB	1920GB	
Sequential (128KB transfer)	Read	6800	6800	MB/s
	Write	5300	5600	
Random (4KB transfer)	Read	900	900	KIOPS
	Write	250	350	
	70/30 Read/Write	550	600	
Latency	Read (TYP)	60	60	µs
	Write (TYP)	15	15	
	Read (99%)	65	65	
	Write (99%)	20	20	

Notes: 1. Performance values measured under the following conditions:

- Steady state as defined by SNIA Solid State Storage Performance Test Specification Enterprise v1.1
- 4K sector size
- 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
- Random 70/30 workloads measured using FIO with a queue depth of 128
- Latency workloads measured with a queue depth of 1

2. Performance values measured with the following system configuration:

- Generic X570 motherboard
- AMD Ryzen7 3700X 8-Core CPU @ 3.6 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 2: Endurance

Estimated Endurance	Total Bytes Written (TBW) in TB		TBW Per Day for 5 Years		Drive Writes Per Day (DWPD) for 5 Years	
	960GB	1920GB	960GB	1920GB	960GB	1920GB
100% 128K sequential writes	105,000	210,000	57.60TB	115.20TB	60	60
100% 4K random writes	68,000	125,000	3360TB	67.20TB	35	35

- 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. All values provided are for reference only and are not warranted values. For warranty information, visit <https://www.micron.com/support/sales-support/returns-and-warranties/enterprise-ssd-warranty> or contact your Micron sales representative.
3. 1TB = 1,000,000,000,000 bytes; 1GB = 1,000,000,000 bytes.

Endurance calculation assumptions for workloads noted above:

- 128KB sequential write workload is 100% sequential-aligned.
- 4K random write workload is 100% 4K-aligned.

Electrical Characteristics

Table 3: Power Consumption

Parameter: Power State 0	U.3		Unit
	960GB	1920GB	
Active READ (maximum RMS)	14	14	W
Active WRITE (maximum RMS)	14	14	W
128K Sequential READ (average RMS)	12	12	W
128K Sequential WRITE (average RMS)	12	12	W
4K Random READ (average RMS)	10	10	W
4KB Random WRITE (average RMS)	11	11	W
Idle (average RMS)	5	5	W

- Notes: 1. Power limiting is configured through SET/GET FEATURES POWER MANAGEMENT.
2. Power consumption measurements are for reference only; actual workload power consumption will vary.

Table 4: Operating Voltage – U.3

Power Rail	Electrical Parameter	Value
12V	Operating voltage	12 Vdc (±8%)
	MIN/MAX rise time	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

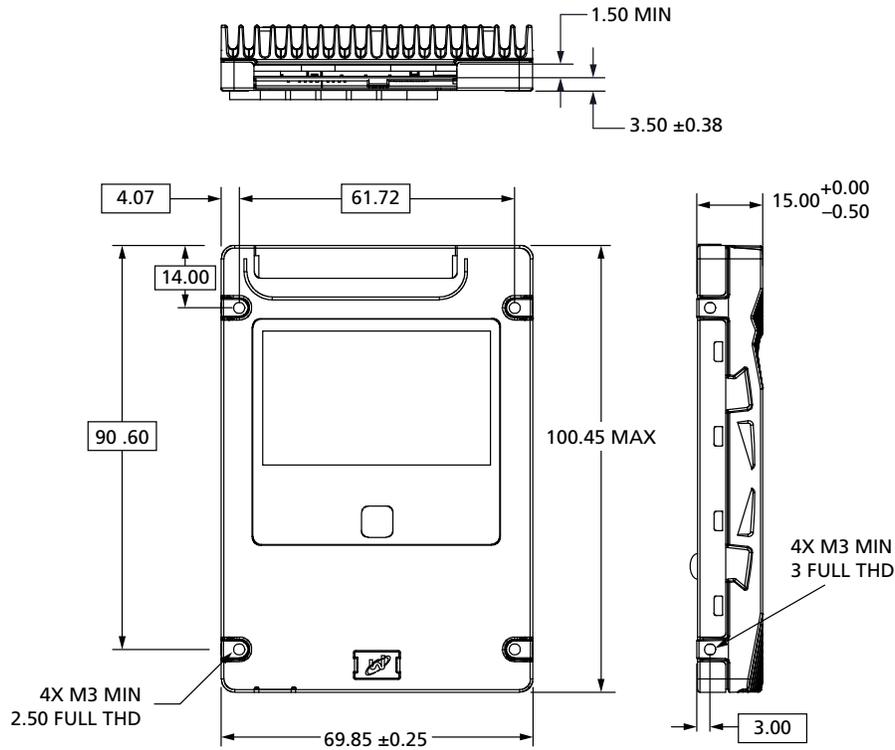
Physical Configuration

U.3 Enterprise PCIe (SFF - 8201 and SFF - 8223)

Product mass: less than 150g grams for U.3 15mm.

Drive connector includes latch slot to support latching connectors.

Figure 2: U.3 15mm Nominal Dimensions



Note: 1. All dimensions are in millimeters.

Table 5: U.3 Enterprise PCIe Maximum Dimensions

Form Factor	Width	Length	Height	Unit
U.3	70.10	100.45	15.00	mm

Note: 1. Dimension values per SFF - 8201, Revision 3.4 and SFF - 8223 Revision 2.7.

Revision History

Rev. A – 6/2023

- Initial release

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This data sheet contains minimum and maximum limits specified over the power supply and temperature range set forth herein. Although considered final, these specifications are subject to change, as further product development and data characterization sometimes occur.