2.5-inch U.2, 15mm, NVMe SSD
1.6TB, 3.2TB, 6.4TB, 1.92TB, 3.84TB, 7.68TB, 15.36TB[1]

FIPS 140-2

Highlights

- Western Digital dual-port NVMe 1.3c compliant controller; PCIe 3.1
- Western Digital 96-Layer 3D TLC NAND
- 1 and 3 DW/D[2]
- Performance: up to RR = 780K IOPS, RW = 257K IOPS, Mixed Random 70/30 Read/Write = 503K IOPS
- MTBF rating of 2.5 million hours (projected)
- Security Options: Secure Erase (SE) and Instant Secure Erase (ISE), TCG Ruby, FIPS 140–2 validation (forthcoming)
- 5-year limited warranty
- Enterprise features including – 128 namespaces, atomic writes, multiple sector sizes, protection information, SGL, NVMe-MI version 1.1

Applications & Workloads

- High performance computing (HPC)
- High availability storage arrays
- All mixed use workloads
- Artifical Intelligence/Machine Learning
- Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP)
- Real-time analytics
- Patern recognition
- Virtualization

Ultrastar® DC SN840

Performance NVMe™ SSDs Enable Enterprise Workloads

NVME™ adoption in the data center continues to grow as modern applications and workloads demand more performance. Performance NVMe SSDs are designed for primary storage for HPC servers and primary storage in external storage arrays. Performance NVMe SSDs target cloud compute and enterprise workloads that require low latency to data and high availability of data. These applications incude real-time data analytics, cloud computing, OLTP/OLAP databases, artifical intelligence (AI), machine learning (ML), pattern recognition and virtualization. The Ultrastar DC SN840 is Western Digital's 3rd generation of performance NVMe SSD for data center with PCIe Gen 3.1 (dua-port), NVMe 1.3, providing up to 3,470/3,330 MB/s Sequential Read/Write and up to 503K IOPS mixed random 70/30 read/write performance.

Dual-port Leadership

Ultrastar DC SN840 extends Western Digital's leadership in dual-port architecture by vertically integrating proven flash controllers. Dual-port high availability supports two redundant paths to the SSD, and is critical to ensuring access to data in the event of a failure in the data path.

Quality, Reliability and Security

Ultrastar DC SN840 is built on Western Digital's 96-layer 3D TLC NAND, with capacities up to 15.36TB in a U.2 2.5" form factor. It offers two endurance classes for workloads; 1 DW/D for read intensive workloads common with the majority of enterprise applications and cloud services, and 3 DW/D for higher write or mixed use workloads such as running SQL. The DC SN840 has a five-year limited warranty with enterprise reliability MTBF of 2.5M hours (projected). The DC SN840 offers security options with Secure Erase (SE), Instant Secure Erase (ISE) with an AES-256 encryption engine, TCG Ruby and FIPS 140–2 validation (forthcoming).

up to **45%**
MORE SEQUENTIAL WRITE PERFORMANCE[3]

up to **67%**
MORE MIXED IOPS (max, 70/30, 4KiB)[3]

Ultrastar® **DC SN840**

Specifications

Model Information

Endurance[3]	1 DW/D	1 DW/D	1 DW/D	1 DW/D	3 DW/D	3 DW/D	3 DW/D
Capacity	1,920GB	3,840GB	7,680GB	15,360GB	1,600GB	3,200GB	6,400GB
Maximum Petabytes Written[3]	3.504	7.008	14.016	28.032	8.76	17.52	35.04

Configuration

Interface	Western Digital NVMe 1.3c Controller, Dual Port PCIe 3.11×4 or 2×2
Form Factor	U.2 2.5-inch, 15mm
Flash Memory Technology	Western Digital 96-Layer 3D TLC NAND

Performance[4]

Read Throughput (max MB/s, Seq 64KiB)	3470	3470	3470	3470	3470	3470	3470
Write Throughput (max MB/s, Seq 64KiB)	2280	3250	3200	3190	2300	3300	3200
Read IOPS (max, Rnd 4KiB)	736K	780K	780K	780K	736K	780K	780K
Write IOPS (max, Rnd 4KiB)	108K	159K	160K	149K	224K	257K	253K
Mixed IOPS (max, 70/30 R/W, 4KiB)	231K	389K	373K	401K	341K	503K	472K
Read Latency (μs, avg.)[5]	74	75	82	84	74	75	82

Reliability

Uncorrectable Bit Error Rate (UBER)	1 in 10^{17}
MTBF[5] (M hours, projected)	2.5M hours
Annualized Failure Rate[6] (AFR, projected)	0.35%
Availability (hrs/day x days/wk)	24×7
Limited Warranty[7] (years)	5
Data Retention	40C/90-day equivalent

Power

Requirement (DC +/- 5%)	12V +/-15% 3.3V +/- 15%
Operating (W, max average)	18
Idle (W)	6

Physical Size

z-height (mm)				15			
Dimensions (width x length, mm)				69.85 × 100.45			
Weight (g, max)	172	173	160	180	172	1773	184

Environmental

Operating Temperature	0° to 70°C (Case)
Non-Operating Temperature[8]	-40° to 85°C

Part Number

SE	ISE	TCG Ruby	TCG FIPS 140–2	Model Number	Capacity	Endurance
OTS1875	OTS2046	OTS2053	OTS2060	WUS4BA119DSP3Xz	1,920GB	1DW/D
OTS1877	OTS2048	OTS2055	OTS2062	WUS4BA138DSP3Xz	3,840GB	1DW/D
OTS1879	OTS2050	OTS2057	OTS2064	WUS4BA176DSP3Xz	7,680GB	1DW/D
OTS1881	OTS2051	OTS2058	OTS2065	WUS4BA1A1DSP3Xz	15,360GB	1DW/D
OTS1874	OTS2045	OTS2052	OTS2059	WUS4C6416DSP3Xz	1,600GB	3DW/D
OTS1876	OTS2047	OTS2054	OTS2061	WUS4C6432DSP3Xz	3,200GB	3DW/D
OTS1878	OTS2049	OTS2056	OTS2063	WUS4C6464DSP3Xz	6,400GB	3DW/D

z	=	Encryption Setting
1	=	Secure Erase
3	=	Instant Secure Erase
4	=	TCG Ruby
5	=	TCG FIPs 140–2

[1] One megabyte (MB) is equal to one million bytes, one gigabyte (GB) is equal to 1,000MB (one billion bytes) and one terabyte (TB) equals 1,000GB (one trillion bytes), and one petabyte (PB) is equal to 1,000TB. Actual user capacity may be less due to operating environment.

[2] Endurance rating based on DW/D using 4KiB 100% random write and JESD 219 workloads over 5 years.

[3] Compared to previous generation in same form factor, 1DW/D.

[4] Based on internal testing. Performance will vary by capacity point, or with the changes in useable capacity. Consult product manual for further details.

All performance measurements are in full sustained mode and are peak values. Subject to change.

[5] Average random read latency at 4KiB, QD=1.

[6] MTBF and AFR specifications will be based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions for this drive model.

MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

[7] The warranty for the product will expire on the earlier of (i) the date when the flash media has reached one-percent (1%) of its remaining life or (ii) the expiration of the time period associated with the product.

[8] Values are based on ambient temperature Avoid non-operational exposure to temperatures in excess of 40°C for periods exceeding three months.

Western Digital®