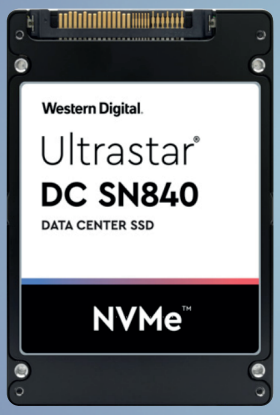


Ultrastar® DC SN840

Western Digital

2.5-inch U.2, 15mm, NVMe SSD
15.36TB

DataSheet **EN**

Features

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
Artificial Intelligence/Machine Learning
Online transaction processing (OLTP) and online analytical processing (OLAP)
Real-time analytics
Pattern recognition
Virtualization

Performance NVMe™ SSDs Enable Enterprise Workloads

NVMeTM 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 include real-time data analytics, cloud computing, OLTP/OLAP databases, artificial 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 (dual-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

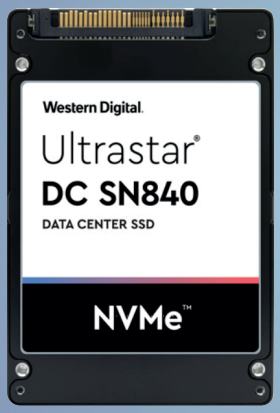
Ultrastar DC SN840 extends Western Digital's leadership in dual-port architecture by vertically integrating proven flash controllers. Dual-port high availability supports two redundant paths to the SSD, and is critical to ensuring access to data in the event of a failure in the data path.

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).

Better with NVMe

Now is the right time to upgrade from SATA SSDs to NVMe performance in cloud/hyperscale and on-prem data centers. The Ultrastar DC SN640 NVMe SSD will help enable lower TCO compared to SATA SSDs, while providing low-latency and performance for current demanding workloads and future requirements.



Ultrastar® DC SN840

Western Digital

2.5-inch U.2, 15mm, NVMe SSD
15.36TB

DataSheet **EN**

Specifications

Model Information

Endurance[2]	1 DW/D
Capacity	15,360GB
Maximum Petabytes Written[2]	28.032

Configuration

Interface	Western Digital NVMe 1.3c Controller, Dual Port PCIe 3.1 1x4 or 2x2
Form Facto	U.2 2.5-inch, 15mm
Flash Memory Technology	Western Digital 96-Layer 3D TLC NAND

Performance[3]

Read Throughput (max MB/s, Seq 64KiB)	3470
Write Throughput (max MB/s, Seq 64KiB)	3190
Read IOPS (max, Rnd 4KiB)	780K
Write IOPS (max, Rnd 4KiB)	149K
Mixed IOPS (max, 70/30 R/W, 4KiB)	401K
Read Latency (µs, avg.)[4]	84

[1] One gigabyte (GB) is equal to 1,000MB (one billion bytes) due to operating environment.

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

[3] Based on internal testing. Performance will vary by capacity point, changes in useable capacity, or security option. Consult product manual for further details. All performance measurements are in full sustained mode and are peak values. Subject to change.

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

Ultrastar® DC SN640

Western Digital

2.5-inch U.2, 7mm, NVMe SSD
960GB, 1.92TB, 3.84TB, 7.68TB[1]

DataSheet **EN**

Features

Western Digital NVMe 1.3c compliant controller; PCIe Gen3.1x4
Western Digital BiCS4 96L 3D TLC NAND•0.8 and 2 DW/D
Data-loss protection•MTBF rating of 2 million hours
Secure Erase (SE), Instant Secure Erase (ISE), TCG Ruby
5-year limited warranty
Enterprise features including variable sector sizes, end-to-end data path protection and Power Loss Protection. TCG Ruby models include 128 namespaces, NVMe-MI version 1.1.

Benefits

Optimized for performance and latency consistency on mixed used workloads
6x read performance improvement over SATA SSDs
Vertically integrated with proven controller architecture accelerates qualification

Specialized for the Following Applications

Boot, cache or storage•Software Defined Storage
File, Block and Object Storage applications
Hyper-converged Infrastructure•Virtualization

Mainstream NVMe™ SSD for Data Center IT and Cloud Deployment

The Ultrastar DC SN640 NVMe SSD is a mainstream NVMe™ SSD targeting broad deployment as boot, caching, or primary storage in data center IT and cloud environments. The DC SN640 is optimized to deliver the highest performance and consistent QoS read latency when running random mixed workloads typically generated by enterprise applications such as virtualization, OLTP, NoSQL, web servers, file servers, and mail servers.

The DC SN640 NVMe SSD is ideal for replacing SATA SSDs by delivering 6x improvement in sequential read performance and 3x improvement random mixed read/write performance. The DC SN640 boosts data center performance and responsiveness as direct attached, distributed storage or in large scale cloud deployments.

The DC SN640 includes Western Digital's 96-Layer BiCS4 3D TLC NAND and Western Digital's NVMe 1.3c controller and incorporates enterprise reliability features, such as power-loss protection, end-to-end data path protection, and a five-year limited warranty.

Designed for Workload Flexibility

The Ultrastar DC SN640 is available in two endurance classes: 0.8 DW/D (capacities from 960GB-7.68TB) and 2 DW/D (capacities 800GB-6.4TB).

The 0.8 DW/D SKU features tunable endurance, giving customers the flexibility to configure endurance and performance for seasonal burst workloads.

Safeguarding Data

The Ultrastar DC SN640 includes power loss protection to ensure that data is not lost during unexpected power interruption. It is available with Secure Erase (SE), Instant Secure Erase (ISE), or TCG Ruby security options. SE and ISE provide entire drive erase options upon decommissioning. The DC SN640 is available as a self-encrypting drive with TCG Ruby to provide protection for data in storage and to help meet compliance criteria.

Better with NVMe

Now is the right time to upgrade from SATA SSDs to NVMe performance in cloud/hyperscale and on-prem data centers. The Ultrastar DC SN640 NVMe SSD will help enable lower TCO compared to SATA SSDs, while providing low-latency and performance for current demanding workloads and future requirements.

Ultrastar® DC SN640

Western Digital

2.5-inch U.2, 7mm, NVMe SSD
960GB, 1.92TB, 3.84TB[1]

DataSheet **EN**

Specifications

Model Information

Endurance[2]	0. 8 DW/D	0. 8 DW/D	0. 8 DW/D
Capacity	960GB	1,920GB	3,840GB
Maximum Petabytes Written[2]	1.4	2.8	5.61

Configuration

Interface	PCIe Gen 3.1 x4 (Compliant to NVMe 1.3c)
Form Facto	2.5-inch U.2. 7mm
Flash Memory Technology	Western Digital BiCS4 3D TLC NAND

Performance[3]

Read Throughput (max MB/s, Seq 128KiB)			
TCG Ruby	3330	3340	3330
SE, ISE	3320	3340	3300
Write Throughput (max MB/s, Seq 128KiB)			
TCG Ruby	1190	2180	2040
SE, ISE	1180	2170	2000
Read IOPS (max, Rnd 4KiB)			
TCG Ruby	434K	515K	511K
SE, ISE	413K	472K	469K
Write IOPS (max, Rnd 4KiB)			
TCG Ruby	49K	88K	82K
SE, ISE	44K	63K	63K
Read Latency (µs, avg.)[4]			
TCG Ruby	78	78	86
SE, ISE	84	84	94

[1] One gigabyte (GB) is equal to 1,000MB (one billion bytes) due to operating environment.

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

[3] Based on internal testing. Performance will vary by capacity point, changes in useable capacity, or security option. Consult product manual for further details. All performance measurements are in full sustained mode and are peak values. Subject to change.

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