Western Digital.

Ultrastar® DC SN640

DATA SHEET

2.5-inch U.2, 7mm, NVMe SSD
800GB, 1.6TB, 3.2TB, 6.4TB, 960GB, 1.92TB, 3.84TB, 7.68TB[1]

Features

- Western Digital NVMe 1.3c compliant controller; PCIe Gen3.1×4
- 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

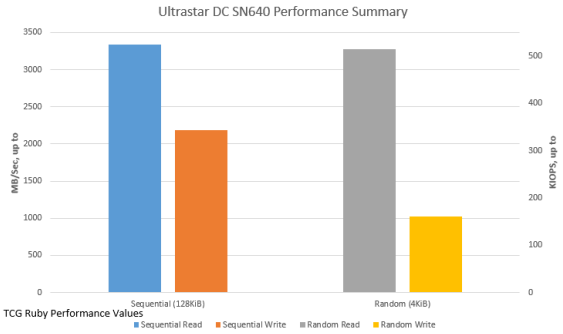
- Boot, cache or storage
- Software Defined Storage
- File, Block and Object Storage applications
- Hyper-converged Infrastructure
- Virtualization

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.

Specifications

Model Information

Endurance[2]	2DW/D	2DW/D	2DW/D	2DW/D	0.8DW/D	0.8DW/D	0.8DW/D	0.8DW/D
Capacity	800GB	1,600GB	3,200GB	6,400GB	960GB	1,920GB	3,840GB	7,680GB
Maximum Petabytes Written[2]	2.92	5.84	11.68	23.36	1.4	2.8	5.61	11.21
Configuration								
Interface	PCIe Gen 3.1 x4 (Compliant to NVMe 1.3c)							
Form Factor	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	3340	3290	3330	3230	3330	3280	3330	3250
SE, ISE	3310	3270	3330	3240	3320	3300	3300	3250
Write Throughput (max MB/s, Seq 128KiB)								
TCG Ruby	1200	2190	2040	1970	1190	2180	2040	1980
SE, ISE	1180	2170	2010	1960	1180	2170	2000	1970
Read IOPS (max, Rnd 4KiB)								
TCG Ruby	434K	515K	511K	496K	434K	515K	511K	496K
SE, ISE	414K	473K	468K	469K	413K	472K	469K	467K
Write IOPS (max, Rnd 4KiB)								
TCG Ruby	113K	161K	158K	149K	49K	88K	82K	85K
SE, ISE	108K	116K	115K	116K	44K	63K	63K	65K
Read Latency (µs, avg.)[4]								
TCG Ruby	79	79	86	87	78	78	86	87
SE, ISE	83	85	94	95	84	84	94	95
Reliability								
Uncorrectable Bit Error Rate (UBER)	1 in 10^{17}							
MTBF[5] (M hours)	2							
Annualized Failure Rate (AFR)[5]	0.44%							
Availability (hrs/day x days/wk)	24x7							
Limited Warranty[6] (years)	5							
Power								
Requirement (DC +/- 10%)	+12V							
Operating Power States (W, max)	10, 11, 12							
Idle (W, average)	< 5W							
Physical Size								
z-height (mm)	7.00 +0.2/-0.5 (including labels)							
Dimensions (width x length x mm)	69.85 (+/- 0.25) x 100.45							
Weight (g, max)	95							
Environmental								
Operating Temperature[7]	0°C to 70°C							
Non-Operating Temperature[8]	-40°C to 85°C							

[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.

[5] MTBF and AFR specifications are 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.

[6] 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.

[7] Composite temperature reading.

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

Part Number

Endurance 0.8 DW/D					Endurance 2 DW/D			
Capacity	**Model Number**	**SE**	**ISE**	**TCG Ruby**	**Capacity**	**Model Number**	**ISE**	**TCG Ruby**
960GB	WUS4BB096D7P3Ez	OTS1960	OTS1927	OTS1849	800GB	WUS4CB080D7P3Ez	OTS1952	OTS1854
1,920GB	WUS4BB019D7P3Ez	OTS1961	OTS1928	OTS1850	1,600GB	WUS4CB016D7P3Ez	OTS1953	OTS1855
3,840GB	WUS4BB038D7P3Ez	OTS1962	OTS1929	OTS1851	3,200GB	WUS4CB032D7P3Ez	OTS1954	OTS1856
7,680GB	WUS4BB076D7P3Ez	OTS1963	OTS1930	OTS1852	6,400GB	WUS4CB064D7P3Ez	OTS1955	OTS1857

z = Encryption Setting

1 = Secure Erase

3 = Instant Secure Erase

4 = TCG Ruby

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