20TB[1]
7200 RPM | SATA 6Gb/s and SAS 12Gb/s

Product Highlights

- 20TB capacity in a standard 3.5-inch form factor
- ePMR & CMR technology works with all capacity enterprise applications & environments
- OptiNAND for highest capacities
- Reliable, field-proven, 7th generation HelioSeal design delivers outstanding power efficiency
- Industry-leading HDD technologies; OptiNAND, EAMR, TSA, HelioSeal
- 2.5M hours (projected) MTBF rating & 5-year limited warranty
- Self-Encrypting Drive (SED) options

Applications

- Cloud and hyperscale storage
- Massive scale-out (MSO), high-density data centers
- Distributed file systems
- Bulk storage using object storage solutions like Ceph™ and OpenStack® Swift
- Primary and secondary storage for Apache Hadoop® for big data analytics

Reimagining the HDD for Exponential Data Growth

Hyperscale cloud, CSPs, enterprises, smart video surveillance partners, NAS suppliers and more, need storage solutions to meet the exponential growth in data creation. When it comes to cost-effective storage of data at scale, hard disk drives (HDDs) continue to play a central role. IDC projects that in 2025, HDDs will represent 82% of storage capacity sold to the enterprise market*. HDDs deliver the capacity, performance, and reliability needed to store vast amounts of data today and well into the future. Investments in HDD technology remain critical to supporting worldwide data growth.

Western Digital has developed flash-enhanced drives with OptiNAND™ technology by vertically integrating the company's leading NAND flash with its world-class HDDs. Western Digital HDDs have been leaders in areal density with industry first technologies of energy-assisted magnetic recording technology (EAMR), triple-stage actuator (TSA), HelioSeal®, and now OptiNAND technology. Higher areal density means higher capacities to meet storage challenges.

20TB HDDs with OptiNAND Technology

OptiNAND integrates an iNAND® Universal Flash Storage (UFS) Embedded Flash Drive (EFD) with traditional spinning disk media, and incorporates innovative changes to the firmware algorithm and system-on-a-chip (SoC). OptiNAND is not a hybrid technology. The drive works smarter, with enhanced firmware algorithms taking advantage of expanded metadata that has been offloaded to the iNAND, enabling more tracks per inch (TPI) with resulting in increased areal density.

The Ultrastar DC HC560, with the first implementation of OptiNAND technology's capacity-enabling features, delivers an unbeaten 20TB capacity in a nine-disk platform (2.2TB/platter) with CMR recording format.

Trusted Reliability and Quality for Data at Scale

The Ultrastar DC HC560 meets modern data center reliability requirements with 2.5M MTBF (projected) and a 5-year limited warranty. It offers security and encryption options to help protect data from unauthorized use, including SED models.

Trust Western Digital and the Ultrastar DC HC560 hard drive to deliver the highest capacity and greatest value for your data center.

Features and Benefits

Features	Benefits
High capacity	20TB HDDs allow more cost-efficient storage in the same footprint.
Industry-first technologies	OptiNAND, energy-assisted magnetic recording (EAMR), triple-stage actuator (TSA) and HelioSeal enable the highest capacities with low power.
Data center workloads, reliability, and quality	Performance-optimized for heavy application workloads and are designed to handle workloads up to 550TB[2] per year. Dependability and reliability with up to 2.5M hours MTBF (projected). 5-year limited warranty.

Specifications

	SATA Models	SAS Models
Model Numbers	WUH722020ALE6L1 WUH722020ALE6L4 WUH722020BLE6L1 WUH722020BLE6L4	WUH722020BL5201 WUH722020BL5204

Configuration

	SATA Models	SAS Models
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1]	20TB	20TB
Format: Sector size (bytes)[2]	4Kn: 4096, 512e: 512	4Kn: 4096, 512e: 512
Areal Density (Gbits/sq. in, max)	1131	1131

Performance

	SATA Models	SAS Models
Data buffer[3] (MB)	512	512
Rotational speed (RPM)	7200	7200
Latency average (ms)	4.16	4.16
Interface transfer rate (MB/s, max)	600	1200
Sustained transfer rate[4] (MB/s, max) / (MiB/s, max)	269/257	269/257

Reliability

	SATA Models	SAS Models
Error rate (non-recoverable bits read)	1 in 10^{15}	1 in 10^{15}
Load/Unload cycles (at 40°C)	600,000	600,000
Availability (hrs/day x days/wk)	24×7	24×7
MTBF[5] (M hours, projected)	2.5	2.5
Annualized Failure Rate[5] (AFR, projected)	0.35%	0.35%
Workloads	Up to 550 TB/year	Up to 550 TB/year
Limited warranty (yrs)	5	5

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

[2] Advanced Format drive: 4K (4096-byte) physical sectors.

[3] Portion of buffer capacity used for drive firmware

[4] Based on internal testing; performance may vary depending on host environment, drive capacity and other factors. 1MiB = 1,048,576 bytes (2^{20}), 1MB = 1,000,000 bytes (10^6)

[5] Projected values. Final MTBF and AFR specifications will be based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, typical workload and 40°C device-reported temperature. Derating of MTBF and AFR will occur above these parameters, up to 550TB/year and 60°C (device reported temperature). MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

[6] SATA models:
Random RW 50/50 8KB QD=1 @40 IOPS, SAS models:
Random RW 50/50 4KB QD=4 @MAX IOPS

[7] Idle specification is based on use of Idle_A.

[8] 5°C ambient temperature, 60°C device reported temperature.

Acoustics

	SATA Models	SAS Models
Idle/Operating (Bels, typical)	2.0/3.2	2.0 / 3.2

Power

	SATA Models	SAS Models
Requirement	+5 VDC, +12VDC	+5 VDC, +12VDC
Operating[6] (W)	7.0† 6.9††	9.3
Idle[7] (W)	6.1† 5.8††	6.1
Power consumption efficiency at idle (W/TB)	0.305† 0.29††	0.305

Physical Size

	SATA Models	SAS Models
z-height (mm)	26.1	26.1
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	101.6 (+/-0.25) x 147
Weight (g, max)	690	690

Environmental (Operating)

	SATA Models	SAS Models
Temperature[8]	5° to 60°C	5° to 60°C
Shock (half-sine wave, 2ms, G)	50	50
Vibration (G RMS, 5 to 500Hz)	0.7 (XYZ)	0.7 (XYZ)

Environmental (Non-operating)

	SATA Models	SAS Models
Ambient temperature	-40° to 70°C	-40° to 70°C
Shock (half-sine wave, 2ms, G)	250	250
Vibration (G RMS, 2 to 200Hz)	1.04 (XYZ)	1.04 (XYZ)

† For models WUH722020ALE6L1, WUH722020ALE6L4
†† For models WUH722020BLE6L1, WUH722020BLE6L4

How to Read the Ultrastar Model Number

WUH722020ALxxyz

W = Western Digital

U = Ultrastar

H = Helium (vs. S for Standard)

72 = 7200 RPM

20 = Full capacity (20TB)

20 = Capacity this model (20TB)

A = Generation code

L = 26.1 z-height

xx = Interface
  E6 = 512e SATA 6Gb/s,
  52 = 512e SAS 12Gb/s

y = Power Disable Pin 3 status
  0 = Power Disable Pin 3 support
  L = Legacy Pin 3 config – no Power Disable support

z = Data Security Mode
  1 = SED*: Self Encrypting Drive TCG-Enterprise and Sanitize Crypto Scramble / Erase
  4 = Base (SE)*: No Encryption. Sanitize Overwrite only.

  * ATA Security Feature Set comes standard on SATA