22TB[1] | 7200 RPM | 6 Gb/s SATA | 12 Gb/s SAS

Highlights

- 22TB capacity in a standard 3.5-inch form factor
- OptiNAND technology for highest capacities, with ArmorCache™ providing enterprise power loss protection and increased performance
- Reliable, field-proven, 8th-generation HelioSeal® design
- Low power for common data center sequential and random read/write workloads
- Industry-leading HDD technologies: ePMR, triple-stage actuator (TSA), HelioSeal
- 2.5M hours (projected) MTBF rating and 5-year limited warranty
- Self-encrypting drive options

Applications/Environments

- Cloud & 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

22TB to Fuel Data Center Expansion

The explosive growth of data from AI/ML, 5G networks, IoT, connected vehicles, and more is fueling growth in data centers. HDD innovation drives the ability to capture, store, analyze, and protect much of this data. Higher-capacity HDDs deliver higher data density, enabling data center expansion and efficiency.

The Ultrastar® DC HC570 22TB data center HDD with OptiNAND™ technology is the next leap in data density. This 22TB data center HDD enables an incredible 22.44PB of raw storage in a typical rack*. This higher volumetric density allows data centers to maximize their storage, especially in footprint- and power-constrained environments.

The Ultrastar DC HC570 combines several industry-first technologies on a 10-disk CMR drive, delivering the performance, quality, and reliability that data center customers require.

Low Power for Lower Operating Costs

Ultrastar HDDs are designed for optimal power over a variety of workloads. The DC HC570 features low power sequential read/write and mixed random read/write workloads.

OptiNAND Technology Benefits

The Ultrastar DC HC570 is the 2nd-generation platform with OptiNAND technology, which integrates an iNAND® Universal Flash Storage (UFS) Embedded Flash Drive (EFD) with traditional spinning disk media.

Western Digital's 2.2TB/disk areal density leadership is extended to a new 10-disk platform, delivering 22TB capacity with CMR recording format. More disks and high areal density work together to maximize data storage efficiency.

OptiNAND improves drive resiliency in the event of an emergency power off (EPO) by increasing the amount of non-volatile memory (NVM) available to flush critical metadata to the iNAND.

ArmorCache™ is a feature enabled by OptiNAND that combines the performance of write cache enabled (WCE) mode and the data protection of write cache disabled (WCD) mode, offering the best of both scenarios. When operating in WCE mode, ArmorCache ensures that the DRAM cache will be safely written in event of an EPO and no data is lost. When operating in WCD mode, the drive will ensure that all user data in DRAM is safely written upon EPO, and the drive will operate with WCE-equivalent performance. Performance and data protection are now identical across both WCE and WCD modes.

Trusted Reliability and Quality for Data at Scale

The Ultrastar DC HC570 meets modern data center reliability requirements with 2.5M MTBF (projected) and a 5-year limited warranty. It is performance-optimized for heavy application workloads and is designed to handle workloads up to 550TB per year. It offers security and encryption options to help protect data from unauthorized use, including SED models.

Trust Western Digital and the Ultrastar DC HC570 hard drive to deliver the highest capacity and greatest value for your data center.

*Configuration: 42U, 10x 4U JBOD, 102 drives/chassis

Specifications

	SATA Models	SAS Models
Model Numbers	WUH722222ALE6L1 WUH722222ALE6L4	WUH722222AL5201 WUH722222AL5204
Part Numbers	0F48154 (SED) 0F48155 (Base SE)	0F48051 (SED) 0F48052 (Base SE)

Configuration

	SATA Models	SAS Models
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1] (TB)	22TB	22TB
Format: Sector size (bytes)[2]	4Kn: 4096 512e: 512	4Kn: 4096 512e: 512
Areal density (Gbits/sq. in.)	1109	1109
ArmorCache	Supported	Supported

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)	291/277	291/277
Random Read[4] 4KB QD=32 (IOPS)	212	212
Random Write[4] 4KB QD=32, WCE/WCD (IOPS)	565/565	565/565
Random[4] 50/50 Read/Write 4KB QD=4 (IOPS)	220	220

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%
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, logical block address (LBA), and other factors. The location of the max rate is at approximately 10% into the capacity of the HDD. 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] Idle specification is based on use of Idle_A.

[7] 5°C ambient temperature, 60°C device reported temperature.

	SATA Models	SAS Models
Acoustics		
Idle/Operating (Bels, typical)	2.0/3.2	2.0/3.2
Power		
Requirement	+5 VDC, +12VDC	+5 VDC, +12VDC
Random 50/50 Read/Write, 4KB QD=4 @MAX IOPS (W)	9.3	9.6
Idle[6] (W)	5.7	6.0
Power consumption efficiency at idle (W/TB)	0.26	0.27
Physical Size		
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)	670	670
Environmental (Operating)		
Temperature[7]	5° C to 60° C	5° C to 60° C
Shock (half-sine wave 2 ms, G)	40	40
Vibration (G RMS 5 to 500 Hz)	0.7	0.7
Environmental (Non-Operating)		
Ambient Temperature	-40° to 70° C	-40° to 70° C
Shock (half-sine wave, G)	200	200
Vibration (G RMS 2 to 200 Hz)	1.04	1.04

NOTE: See "How to read the Ultrastar model number" below for possible values for xx and y.

How to Read the Ultrastar Model Number

WUH722222ALxxyz

W = Western Digital
U = Ultrastar
H = Helium (vs. S for Standard)
72 = 7200 RPM
22 = Full capacity (22TB)
22 = Capacity this model (22TB)
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

Western Digital