



Ultrastar® Hs¹⁴

Highlights

- Industry’s first enterprise-grade 14TB¹ HDD
- Combines HelioSeal® and host-managed SMR to deliver 16% more capacity than 12TB PMR drives
- Purpose-built for “sequential write” applications
- Consistent, predictable performance with uncompromising enterprise-class quality and reliability for true enterprise experience
- 2.5M hour MTBF² rating
- 5-year limited warranty

Applications/Environments

- Big Data or Bulk Storage
- Cloud Storage
- Social Media
- Content Libraries, Streaming Media and Digital Media Assets
- Online Back-up and Replication
- Compliance, Audits, and Regulatory Records



14TB Host-Managed SMR HDD
7200 RPM | SATA 6Gb/s & SAS 12Gb/s



Beyond Create and Modify: Purpose-built for Sequential Write Workloads

As cloud and hyperscale data centers look for affordable options to capture the growing volume and variety of data, HGST launches the world’s first enterprise-class 14TB HDD, Ultrastar® Hs¹⁴. Based on host-managed shingled magnetic recording (SMR) technology, this 3.5-inch hard drive helps address Big Data challenges and the emerging sequential write workload segment in the data center. Optimized to deliver the highest capacity at low total cost of ownership (TCO), the Hs¹⁴ provides unprecedented capacity leadership by harnessing two core complementary technologies—4th generation HelioSeal® technology and 2nd generation host-managed SMR. These field-proven technologies provide the foundation for delivering efficiency, quality and reliable performance required by cloud and hyperscale data centers.



Preparing to use Host-Managed SMR

To take advantage of the capacity and predictable performance of host-managed SMR, customers will need to modify their end application or kernel space to interface with new command sets, and data streams must be sequentialized for writing to the drive. Ultrastar Hs¹⁴ drives are designed specifically for sequential-write environments and will not work as drop-in replacements for traditional capacity enterprise drives. The investments made in software changes will also help enable future host-based SMR solutions, and provide a path to streamlined deployment of future recording technologies.



Designed with the Customer in Mind

The Ultrastar Hs¹⁴ is built on the proven and mature HelioSeal platform to deliver an unmatched Watt/TB power footprint for online storage. Built for enterprise workloads up to 550TB/year, Hs¹⁴ is ideal for ultra-dense scale-out storage systems, with uncompromising product reliability, necessary for private and public cloud enterprise applications. Industry-standard SATA 6Gb/s or SAS 12Gb/s interface options support a variety of data center configurations.

By combining host-managed SMR with HelioSeal technology, Ultrastar Hs¹⁴ offers a 16% increase in capacity compared to 12TB drives using perpendicular magnetic recording (PMR) technology, while delivering highly predictable, highly reliable performance. Because host-managed SMR enforces a sequential stream of all incoming data, and also provides control at the host level, customers can now intelligently tier their storage from hot-to-cold while maintaining a consistent performance profile regardless of packet size, number of data streams, or workload.

Features & Benefits

	Feature / Function	Benefits
Technology	<ul style="list-style-type: none"> • HelioSeal technology • Host-managed SMR 	<ul style="list-style-type: none"> • 16% boost in capacity over 12TB PMR-based alternatives, while delivering consistent performance for enterprise applications
Capacity	<ul style="list-style-type: none"> • 14TB 	<ul style="list-style-type: none"> • Highest enterprise-grade storage capacity for sequential write workloads
Power Efficiency	<ul style="list-style-type: none"> • Extremely low Watts/TB • Advanced power management technology 	<ul style="list-style-type: none"> • 16% better than He12 (SATA); 27% better than prior SMR generation (SATA) • Additional power savings with instant-on capability
Reliability (enterprise-grade)	<ul style="list-style-type: none"> • 2.5M hour MTBF • 5-yr limited warranty • Rotational Vibration Safeguard 	<ul style="list-style-type: none"> • Lower AFR over product life provides for appreciable TCO savings • Best-in-class SMR drive warranty to match enterprise-grade quality • Helps maintain performance in multi-drive, ultra-dense systems
Performance	<ul style="list-style-type: none"> • 7200 RPM • 233MB/s (max) sustained transfer rate 	<ul style="list-style-type: none"> • Enterprise-grade performance for data center applications • Consistent, predictable performance for sequential workloads
Data Security	<ul style="list-style-type: none"> • Instant Secure Erase 	<ul style="list-style-type: none"> • Provides security and easy redeployment



Ultrastar® Hs¹⁴

Specifications

Configuration	SATA Models	SAS Models
Model No.	HSH721414ALE6M0 HSH721414ALE6M4 HSH721414ALN6M0 HSH721414ALN6M4	HSH721414AL52M0 HSH721414AL52M4 HSH721414AL42M0 HSH721414AL42M4
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity ¹ (TB)	14	←
Form Factor	3.5-inch	←
Format: Sector size ³ (bytes)	512e: 512 4Kn: 4096	512e: 512, 520, 528 4Kn: 4096, 4112, 4160, 4224
Areal density (Gbits/sq. in., max)	1034	←

Performance

Data buffer ⁴ (MB)	512	←
Rotational speed (RPM)	7200	←
Latency average (ms)	4.16	←
Interface transfer rate ⁵ (MB/s, max)	600	1200
Sustained transfer rate ⁵ (MiB/s, max)	223	←
(MB/s, max)	233	←
Seek time ⁶ (read/write, ms, typical)	7.7/12.0	←

Reliability

Error rate (non-recoverable, bits read)	1 in 10 ¹⁵	←
Load/Unload cycles (at 40°C)	600,000	←
MTBF ² (M hours)	2.5	←
Annualized failure rate ² (AFR)	0.35%	←
Availability (hrs/day x days/wk)	24x7	←
Limited warranty (yrs)	5	←

Power

Requirement	+5 VDC, +12VDC (+/-5%)	←
Operating ⁷ (W)	6.4	8.3
Idle ⁸ (W)	5.2	6.2
Power consumption efficiency at Idle (Watts/GB)	0.00037	0.00044
(Watts/TB)	0.37	0.44

Acoustics

Idle (Bels, typical)	2.0/3.6	←
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Physical size

z-height (mm)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	660	←

Environmental (Operating)

Ambient temperature	5° to 60° C	←
Shock (half-sine wave 2 ms, G)	70	←
Vibration (G RMS 5 to 500 Hz)	0.67 (XYZ)	←

Environmental (Non-Operating)

Ambient temperature	-40° to 70° C	←
Shock (half-sine wave, G)	300	←
Random vibration (G RMS 2 to 200 Hz)	1.04 (XYZ)	←



HGST Quality and Service

The Ultrastar Hs14 HDD extends HGST's long-standing tradition of reliability leadership with a 2.5M-hour MTBF rating and a 5-year limited warranty. Ultrastar quality, capacity, power efficiency, and world-class technical support and service provides customers with a lower total cost of ownership over previous generations. HGST drives are backed by an array of technical support and services, which may include customer and integration assistance. HGST is dedicated to providing a complete portfolio of HDD, SSD and systems to help the world harness the power of data.

How to Read the Ultrastar Model Number

Example: HSH721414ALE6M0 = 14TB SATA 6Gb/s 512e

H = HGST

S = SMR

H = HelioSeal® technology

72 = 7200 RPM

14 = Max capacity in series (14TB)

14 = Capacity of this model (14=14TB)

A = Generation code

L = 26.1mm z-height

E6 = Interface

(E6=512e SATA 6Gb/s, N6=4Kn SATA 6Gb/s,

52=512e SAS 12Gb/s, 42=4Kn SAS 12Gb/s)

M = Host-Managed

O = Instant Secure Erase support (4 = Secure Erase support)

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) when referring to hard drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the hard drive, the computer's operating system, and other factors.

² 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.

³ Advanced Format drive: 4K (4096-byte) physical sectors

⁴ Portion of buffer capacity used for drive firmware

⁵ MiB/s is 2²⁰ bytes, MB/s is 10⁶ bytes

⁶ Excludes command overhead

⁷ SATA models: 8K Queue Depth = 1 @ 40 IOPS, SAS models: 4K Queue Depth = 4

⁸ Idle specification is based on use of Idle_A