

World's first enterprise-class 4TB, 7200 RPM drive, specified at 2.0 million hours MTBF<sup>1</sup> for high-capacity nearline environments

## Highlights

- > 2.0 million hours MTBF
- > Up to 4 terabytes<sup>2</sup> of capacity
- > Advanced Format
- > 512 byte emulation (512e)
- > 6Gb/s SATA interface
- > Dual Stage Actuator (DSA) and Enhanced Rotational Vibration Safeguard (RVS) for robust performance in multi-drive environments
- > 24x7 accessibility for enterprise-class, capacity-optimized applications
- > 5-year limited warranty

## Applications/Environments

- > Cloud storage
- > Massive Scale Out (MSO)
- > Data warehousing & mining
- > Disk-to-disk backup & archiving
- > RAID arrays
- > Network Attached Storage (NAS)



4TB, 3TB and 2TB  
7200 RPM | SATA 6Gb/s



## Features and Benefits

	Feature / Function	Benefits
<b>Capacity</b>	4TB, 3TB and 2TB	Highest enterprise capacity available in a single platform
<b>Performance</b>	Rotational Vibration Safeguard (RVS)	Maintains drive performance in high rotational vibration environments and multi-drive systems
<b>Reliability</b>	Thermal Fly-height Control (TFC) with internal thermal sensor	Better soft error rate for improved reliability and performance
	Head load/unload	Protects disk during non-operation
	SMART command transport	Adaptive error correction
<b>Power</b>	Improved watts per gigabyte (W/GB)	24% lower W/GB than predecessor for maximum efficiency
<b>Security</b>	Optional Bulk Data Encryption	Encrypt private data, providing security and easy redeployment

## Delivering industry-leading quality and reliability

HGST Ultrastar™ 7K4000 is the world's first 4TB 7200 RPM hard drive with a 2.0 million hours MTBF specification and backed by a full 5-year warranty. Ultrastar 7K4000 represents the sixth-generation HGST 5-platter design, which has been field proven by top server and storage OEMs and Internet giants. Engineered for the highest quality, the Ultrastar 7K4000 is put through grueling design tests during development and must pass stringent ongoing reliability testing during manufacturing. Ultrastar 7K4000 delivers by reducing downtime, eliminating service calls and minimizing TCO.

## Increasing capacity density by one third

To deal with the explosive petabyte (PB) growth, data centers require large amounts of efficient storage. Reducing W/GB without expanding floor space is vital to lowering operating costs. To meet these demands, Ultrastar 7K4000 delivers 33% more capacity in the same footprint at 24% lower W/GB than its predecessor, Ultrastar 7K3000. Now you can get 2.4 PB in the footprint of a standard 19-inch enterprise storage rack by stacking ten 4U, 60-bay enclosures. Ultrastar 7K4000 is an Advanced Format drive, using 4096-byte sector size to provide enormous capacity earlier than otherwise possible for environments optimized for this technology. Advanced Format drives are backwards compatible with legacy 512-byte sector size by offering built-in 512-byte emulation through the SATA interface.

## Combining 7200 RPM performance and granular power control

Operating at 7200 RPM, Ultrastar 7K4000 offers better overall performance than slower RPM capacity-oriented drives, and does so at impressively low power-consumption rates. The Ultrastar 7K4000 can help data centers achieve lower AC power and HVAC requirements. With five Advanced Power Management modes, the 7K4000 achieves a 59% reduction in watts during low RPM idle mode, and uses less than 1W during standby/sleep modes, freeing up precious headroom for growing enterprise needs.

## Innovating for a more sustainable environment

The Ultrastar 7K4000, with its halogen-free design and power-efficient operation, qualifies for the HGST EcoTrac classification, which identifies products that minimize environmental impact in the areas of product design, manufacturing, operation and disposal.

## Specifications

<b>Model(s)</b>	HUS724040ALE640 HUS724030ALE640 HUS724020ALE640
<b>Configuration</b>	
Interface	SATA 6Gb/s
Capacity (GB) <sup>2</sup> at 512 Bytes/sector	4TB / 3TB / 2TB
Form factor	3.5-inch
Sector size (bytes) <sup>3</sup>	512e
Max. areal density (Gbits/sq. in)	446
<b>Performance</b>	
Data buffer (MB) <sup>4</sup>	64
Rotational speed (RPM)	7200
Interface transfer rate (MB/sec, max)	600
Sustained transfer rate (MB/sec, typical)	171
Seek time (read, ms, typical) <sup>5</sup>	8.0
<b>Reliability</b>	
Error rate (non-recoverable, bits read)	1 in 10 <sup>15</sup>
Load/unload cycles (at 40° C)	600,000
Availability (hrs/day x days/wk)	24x7
Targeted MTBF <sup>1</sup> (M hours)	2.0
Warranty (yrs.)	5
<b>Acoustics</b>	
Idle (Bels, typical)	2.9
<b>Power</b>	
Requirement	+5 VDC (+/-5%) +12 VDC (+10%/-8%)
Startup current (A, max)	1.2 (+5V), 2.0 (+12V)
Read/write (W)	11.4
Unload idle (W)	5.7
<b>Physical size</b>	
z-height (mm, max)	26.1
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147
Weight (g, typical)	690
<b>Environmental (operating)</b>	
Ambient temperature	5° to 60° C
Shock (half-sine wave 2 ms, G)	70
Vibration, random (G RMS 5 to 500 Hz)	0.67 (XYZ)
<b>Environmental (non-operating)</b>	
Ambient temperature	-40° to 70° C
Shock (half-sine wave 1ms, G)	300

<sup>1</sup> Intended for use in lower duty cycle environments in the enterprise storage hierarchy such as nearline applications. This MTBF rating is based on a sample population and is estimated by statistical measurements and acceleration algorithms under nominal operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.

<sup>2</sup> 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.

<sup>3</sup> Advanced Format drive: 4K physical sectors with 512 emulation

<sup>4</sup> Portion of buffer capacity used for firmware.

<sup>5</sup> Excludes command overhead

## HGST quality and service

Ultrastar 7K4000 extends the company's long-standing tradition of performance and capacity leadership. The proven drive design enables high reliability and availability to customer data. Ultrastar quality, performance 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 solutions to satisfy today's monumental computing needs.

## How to read the Ultrastar model number

HUS724040ALE640 = 4TB, SATA 6Gb/s, 64MB buffer

H = HGST

U = Ultrastar

S = Standard

72 = 7200 RPM

40 = Full capacity — 4TB

40 = Capacity this model, 40 = 4TB  
(30 = 3TB, 20 = 2TB)

A = Generation code

L = 26.1mm z-height

E6 = SATA 6Gb/s, 512e

4 = 64MB buffer

0 = No encryption (1 = encryption)

## Information and Technical Support

[www.hgst.com](http://www.hgst.com) (Main Web site)

[www.hgst.com/partners](http://www.hgst.com/partners) (Partner Web site)

[www.hitachigst.com/AdvancedFormat](http://www.hitachigst.com/AdvancedFormat)

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## Program Support

Partners First Program

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The EcoTrac symbol identifies HGST hard drives that deliver on the principles of lower operating costs, safer product disposal and a more sustainable environment.