MegaScale DC™ 4000.B

3.5-Inch Enterprise Coolspin Hard Disk Drives

Highlights

- 24x7 accessibility for enterprise-class, capacity-optimized applications
- 800K hours MTBF[1]
- 3-year limited warranty
- 4 terabytes[2] of capacity
- Advanced Format[3] with 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

Applications/Environments

- Low application workload cloud storage
- Massive Scale Out (MSO)
- Data warehousing & mining
- Disk-to-disk backup & archiving

Application
Workload Rating

Innovation to Support Low-workload Applications

The HGST MegaScale DC™ 4000.B is designed to meet the needs of the scale-out data center where low-power, high-capacity, cost-effective storage is essential. MegaScale DC addresses low application workloads that operate within 180TB per year. Typical low-workload applications include multi-drive replicated environments, disk-to-disk backup and restore snapshots, online archives, big data stores and long-term data retention that benefit from low-cost or energy usage.

Understanding Workload is Key

HGST offers a comprehensive product portfolio to address the different workloads within the data center so our customers can maximize their return. When selecting hard disk drive, it's important to consider the application workload. Workload is defined as the amount of work stress the HDD can endure during normal operating conditions. To achieve high storage density, components within the hard drive chassis move with precision. This complex engineering requires that HDDs have an optimized design rated for a specific usage time and workload range. Our products have the highest reliability ratings for the rated workloads. To ensure optimal efficiency, it's critical that data center managers make informed decisions when selecting the right storage design with the right specifications for the right application workload.

Minimizing Power Consumption

MegaScale DC drives leverage Advanced Power Management technology which offers five levels of granularity to help manage power consumption including: normal idle; unload idle; low RPM idle; standby; and sleep. The standby and sleep modes consume less than 1 watt, enabling archival applications to remain online and ready to respond, yet at eco-friendly power levels.

Features and Benefits

	Feature / Function	Benefits
Capacity	4TB in 5-disk design	Highest enterprise capacity availability in a single platform
Performance	Rotational Vibration Safeguard (RVS)	Maintains drive performance in high rotational vibration environments and multi-drive systems
Reliability	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
Power	CoolSpin™ Technology	Saves on power
Security	Bulk Data Encryption with Enhanced Secure Erase	Encrypt data, providing security and easy, safe redeployment

4TB l CoolSpin Technology
SATA 6Gb/s

HGST
a Western Digital company

HGST Quality and Service

HGST's MegaScale DC extends the company's long-standing tradition of performance and capacity leadership. The proven drive design enables high reliability and availability to customer data. MegaScale DC 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 MegaScale DC model number

HMS5C4040BLE640 = 4TB, SATA 6Gb/s, 64MB buffer

H	=	HGST
M	=	Megascale DC
S	=	Standard
5C	=	CoolSpin
40	=	Full capacity — 4TB
40	=	Capacity this model, 40 = 4TB
B	=	Generation code
L	=	26.1mm z-height
E6	=	Interface, SATA 6Gb/s, 512e
4	=	64MB buffer
0	=	No encryption (1 = encryption)

Information and Technical Support

www.hgst.com (Main Web site)
www.hgst.com/partners (Partner Web site)

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Program Support

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Specifications

Model # / Part #	HMS5C4040BLE640 / 0F22146 HMS5C4040BLE641 / 0F22149
Configuration	
Interface	SATA 6Gb/s
Capacity (GB)[2] at 512 bytes/sector	4TB
Form factor	3.5-inch
Sector size (bytes)[3]	512e
Max. areal density (Gbits/sq. in)	443
Performance	
Data buffer (MB)[4]	64
Rotational speed (RPM)	CoolSpin
Interface transfer rate (MB/s, max)	600
Sustained transfer rate (MB/s, typical)[5]	110-140
Reliability	
Error rate (non-recoverable, bits read)	1 in 10^{14}
Load/Unload cycles (at 40° C)	300,000
Availability (hrs/day x days/wk)	24x7
MTBF[1] (hours)	800K
Warranty (yrs.)	3
Acoustics	
Idle (Bels, typical)	2.5
Power	
Requirement	+5 VDC (+/-5%) +12VDC (+10%/-8%)
Startup current (A, max)	1.2 (+5V), 1.5 (+12V)
Read/write (W)	6.2
Idle (W, average)	4.9
Unload idle (W)	4.0
Physical size	
z-height (mm, max)	26.1
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147
Weight (g, typical)	690
Environmental (operating)	
Ambient temperature	5° to 60° C
Shock (half-sine wave, 2ms, 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, 1ms, G)	300

[1] Use of MegaScale products in higher duty cycle environments will have a negative impact on reliability. MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under median operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.

[2] 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.

[3] Advanced Format drive: 4K (4096-byte) physical sectors with 512-byte emulation (512e). 512n = 512-byte native physical sectors

[4] Portion of buffer capacity used for firmware

[5] MB/s based on 1,000,000 bytes per second