



# Ultrastar® C15K600

## Highlights

- 15,000 RPM performance for Tier 0/1 applications
- Capacities up to 600GB<sup>1</sup>
- Industry-leading 12Gb/s SAS moves more data quickly and reliably
- Compared to 15K 3.5-inch HDDs:
  - 2.5X faster random write performance
  - 14% faster random read performance
  - 38% faster sequential performance
  - 54% lower active and idle power
  - 70% smaller footprint
- 2M hours MTBF<sup>2</sup> rating
- 128MB cache buffer manages data efficiency
- Security & encryption models including ISE, TCG-SED & FIPS 140-2 certified TCG-SED

## Applications/Environments

- High Performance Computing (HPC) & other high-performance, mission-critical applications requiring 24x7 availability
- Tier 0/1 enterprise-class servers and networked storage arrays
- High reliability blade, pedestal and rack-mounted servers
- Systems needing the highest levels of data security to meet compliance-driven requirements
- Databases and intense Online Transaction Processing (OLTP)
- Servers and storage arrays (DAS, SAN and NAS)



600GB, 450GB and 300GB 15,000 RPM  
2.5-inch SFF | SAS 12Gb/s



## Big Performance and Capacity in a Small Package

HGST delivers the world's fastest hard disk drive in the Ultrastar® C15K600, a 15K RPM, 2.5-inch small form factor hard drive ideally suited for mission-critical data center and high performance computing environments. At 600GB, Ultrastar C15K600 provides double the capacity of current generation 2.5-inch 15K drives, and matches the highest capacity point of 3.5-inch 15K drives. This latest addition to the Ultrastar small form factor (SFF) family outperforms not only the competition but also legacy 3.5-inch 15K drives from HGST, achieving 38% faster sequential and 2.5X faster random write performance for faster data processing, while consuming half as much active and idle power.

Best-in-class performance is achieved through several innovations, including media caching technology that provides a large caching mechanism for incoming data resulting in significantly enhanced write performance over solutions with limited NAND or flash-based non-volatile cache (NVC). The C15K600 is HGST's first hard drive to leverage an industry-leading 12Gb/s Serial-Attached SCSI (SAS) interface enabling very high transfer rates between host and drive, supporting the performance and reliability required in the most demanding enterprise computing environments like on-line transaction processing (OLTP), big data analytics, multi-user applications and data warehousing.

## Power and Density Efficiency

The compact size and power management innovations designed into the Ultrastar C15K600 enable high levels of power efficiency and translate into reduced power requirements and lower cooling costs, an ideal choice for enterprise data centers faced with space and power limitations. Compared to legacy 3.5-inch 15K drives, Ultrastar C15K600 consumes 70% less space yet provides up to 55% lower active power and 54% lower idle power requirements. HGST Advanced Power Management technology, with multi-state idle modes, uses industry-recognized standards for power optimization and can be pre-programmed or manually initiated in the system.

## Enterprise Reliability and Data Security

The Ultrastar C15K600 offers the broadest range of security options and encryption options available from HGST, including Instant Secure Erase (ISE), Trusted Computing Group (TCG) enterprise SSC-compliant Self-Encrypting Drives (SED), and TCG enterprise SED with FIPS (Federal Information Processing Standard) 140-2 certification, Level 2, which provides data-at-rest and tamper evidence protection for the most stringent regulatory data security compliance requirements. Ultrastar C15K600 extends the company's long-standing tradition of reliability leadership with a 2M hour MTBF rating, an annualized failure rate (AFR) of 0.44% and a 5-year limited warranty.

## Features & Benefits

	Feature / Function	Benefits
Performance	<ul style="list-style-type: none"> <li>• 15K RPM</li> <li>• SAS 12Gb/s</li> <li>• Media caching technology</li> <li>• Rotational Vibration Safeguard (RVS)</li> <li>• Workload detector technology</li> </ul>	<ul style="list-style-type: none"> <li>• Highest speed available for enterprise-class HDDs</li> <li>• Industry's fastest SAS interface for maximum throughput</li> <li>• Significantly enhanced over solutions with limited NAND or flash-based non-volatile cache (NVC)</li> <li>• Maintains optimum performance in multi-drive systems</li> <li>• Maximizes performance in multi-drive systems</li> </ul>
Capacity	<ul style="list-style-type: none"> <li>• Up to 600GB</li> </ul>	<ul style="list-style-type: none"> <li>• Double current 2.5-inch 15K drives and matches 3.5-inch 15K drives</li> </ul>
Power Efficiency	<ul style="list-style-type: none"> <li>• 2.5-inch form factor</li> <li>• Advanced Power Management</li> </ul>	<ul style="list-style-type: none"> <li>• Consumes up to 55% less power than 3.5-inch HGST drives</li> <li>• Optimizes power consumption to lower data center energy usage and cooling costs</li> </ul>
Reliability	<ul style="list-style-type: none"> <li>• IDRC technology</li> <li>• RRO fields</li> <li>• End-to-end data protection (ANSI)</li> </ul>	<ul style="list-style-type: none"> <li>• Improves signal processing for more robust data integrity</li> <li>• Improves handling of repeatable run out to lower risk of data squeeze and write inhibit rate</li> <li>• Enhances error detection for optimal data integrity</li> </ul>
Security	<ul style="list-style-type: none"> <li>• Optional SED models</li> </ul>	<ul style="list-style-type: none"> <li>• Encrypts data, providing security and easy redeployment</li> </ul>



# Ultrastar® C15K600

## Specifications

Model No.	HUC156060CSS20x HUzC156045CSS20x HUC156030CSS20x	HUC156060CS420x HUC156045CS420x HUC156030CS420x
<b>Configuration</b>		
Interface	SAS 12Gb/s	←
Capacity <sup>1</sup> (GB)	600GB / 450GB / 300GB	←
Sector size (variable, bytes/sector)	512-Byte (512n)	4096-Byte (512e, 4Kn)
Recording zones	40	←
Data heads (physical)	6 / 4 / 3	←
Data disks	3 / 2 / 2	←
Max. Areal density (Gbits/sq. in.)	528	460
<b>Performance</b>		
Data buffer <sup>3</sup> (MB)	128	←
Rotational speed (RPM)	15,030	←
Latency average (ms)	<2.0	←
Interface transfer rate <sup>4</sup> (MB/s, max)	1200	←
Sustained transfer rate <sup>4</sup> (MB/s, typical)	175 to 250	189 to 271
Seek time <sup>5</sup> (read/write, ms, typical)	2.9 / 3.1	←
<b>Reliability</b>		
Error rate (non-recoverable, bits read)	10 in 10 <sup>17</sup>	←
MTBF <sup>6</sup> (M hours)	2.0	←
Annualized Failure Rate <sup>2</sup> (AFR)	0.44%	←
Availability (hrs/day x days/wk)	24x7	←
<b>Acoustics</b>		
Idle (Bels, typical)	3.2	←

### Power

Requirement	+5 VDC (+/-5%), +12 VDC (+/-5%)	←
Operating <sup>6</sup> (W, typical)	7.5 / 7.0 / 7.0	←
Idle <sup>7</sup> (W)	5.8 / 5.1 / 5.0	←
Idle efficiency (Watt/GB)	0.0096 / 0.0113 / 0.0168	←

### Physical size

z-height (mm)	14.8	←
Dimensions (width x depth, mm)	70.1 x 100.45	←
Weight (g, max)	219	←

### Environmental (operating)

Ambient temperature	5° to 55° C	←
Shock (half-sine wave, 2ms, read operation, G)	60	←
Vibration, random, no errors (G RMS 5 to 500 Hz)	0.4, all axes	←

### Environmental (non-operating)

Ambient temperature	-40° to 70° C	←
Shock (half-sine wave, 2ms, G)	>300	←
Vibration (RMS 5 to 500 Hz)	1.5G, all axes	←

## HGST Quality and Service

HGST's Ultrastar C15K600 extends the company's long-standing tradition of performance and reliability leadership. A balanced combination of new and proven technologies enables high reliability and availability to customer data.

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 breadth of hard disk drive solutions to satisfy all of today's demanding computing needs.

### How to read the Ultrastar model number

HUC156060CSS200 = 600GB, SAS 12Gb/s  
 H = HGST  
 U = Ultrastar  
 C = Compact (vs S for Standard)  
 15 = 15,000 RPM  
 60 = Full capacity — 600GB  
 60 = Capacity this model, 60 = 600GB  
 (45 = 450GB, 30 = 300GB)  
 C = Generation code  
 S = 15mm z-height  
 S2 = Interface, SAS 12Gb/s 512n  
 (42 = SAS 12Gb/s 4Kn/512e)  
 0 = Reserved  
 0 = Data Security Mode  
 (0 = Instant secure erase  
 1 = TCG SED  
 4 = Secure erase  
 5 = TCG SED with FIPS)

<sup>1</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>2</sup> MTBF and AFR targets are based on a sample population and are estimated by statistical measurements and acceleration algorithms under median operating conditions. MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

<sup>3</sup> Advanced Format drive: 4K (4096-byte) physical sec

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

<sup>5</sup> MiB/s is 220 bytes, MB/s is 106 bytes

<sup>6</sup> Excludes command overhead

<sup>7</sup> SATA models: 8K Queue Depth = 1, SAS models: 4K Queue Depth = 4

<sup>8</sup> Idle specification is based on use of Idle\_A