

Ultrastar® SSD1600MM

Enterprise Solid-State Drives

Highlights

- MLC NAND Flash for ultra-high performance and endurance
- Mainstream endurance 10DW/D for 5 years
- Best IOPS/Watt for reduced TCO
- 12Gb/s SAS interface for maximum throughput
- Advanced power loss data management technology
- Self-encrypting models conform to TCG's Enterprise specification

Applications/Environments

- Ultra-high performance tier-0 enterprise storage
- Enterprise-class servers and high performance computing
- Space and/or power constrained environments
- Online Transaction Processing (OLTP)
- Video pre- and post-production
- Financial and e-commerce
- Database analytics



1600GB, 800GB, 400GB and 200GB
MLC | 2.5-inch SFF | SAS 12Gb/s

HGST Enterprise Storage Experience

HGST leverages decades of proven enterprise storage expertise in Serial Attached SCSI (SAS) design, reliability, firmware, customer qualification and system integration to the Ultrastar® SSD1600MM solid-state drive (SSD) family. The synergistic relationship between HGST's throughput-enhancing SSDs and traditional HDDs provides cost effective, end-to-end enterprise-class storage solutions, delivering reliability, compatibility, capacity, cost and system performance. This combination makes HGST a leading SSD/HDD provider with the experience and technology needed to meet escalating reliability, endurance and performance in the most demanding enterprise environments.

Maximum Performance, Reliability and Endurance

The Ultrastar SSD1600MM delivers high sequential throughput, up to 1100MB/s read and 765MB/s write (12Gb/s SAS). The Ultrastar SSD1600MM also delivers up to 130,000 read and 100,000 write IOPS, reaching speeds >100 times faster than HDDs and double the speed of current 6Gb/s SSDs, allowing rapid access to "hot" enterprise data for improved productivity and operational efficiency. The Ultrastar SSD1600MM family offers significant value in terms of IOPS per Watt, while reducing total cost of ownership (TCO) through low power consumption, efficient cooling and reduced space requirements.

The Ultrastar SSD1600MM family combines enterprise-grade MLC NAND Flash memory, advanced endurance management firmware and power loss data management techniques to extend reliability, endurance and sustained performance over the life of the SSD. The Ultrastar SSD1600MM family achieves an extraordinary 0.44% annual failure rate (AFR) or two million hour mean-time-between-failure (MTBF). The 1600GB capacity model endures up to 29.2 Petabytes (PB) of random writes over the life of the drive—the equivalent of writing 16 Terabytes (TB) per day for five years.

For complete end-to-end data protection and reliability, the Ultrastar SSD1600MM family incorporates the T10 Data Integrity Field (DIF) standard, extended error correction code (ECC), Exclusive-OR (XOR) parity to protect against flash die failure, parity-checked internal data paths without an external write cache, and an exclusive power loss data management feature that does not require supercapacitors. The Ultrastar SSD1600MM family is backed by a five year limited warranty, or the maximum Petabytes (PB) written (based on capacity).

Features and Benefits

	Feature / Function	Benefits
Performance	SAS 12Gb/s	12Gb/s / 6Gb/s Active-Active Dual Port
	MLC NAND Flash memory	Highest write performance with cost improved NAND for high endurance
	1100MB/s / 765MB/s sequential R/W	Maximum throughput and IOPS for ultra-fast access to data; >100x faster than typical HDD
	130K / 100K IOPS random R/W	
	110K IOPS on 70/30 mix R/W	
Power	9.0 and 11.0 Watt options	Improved performance with higher power option
Capacity	1600GB, 800GB, 400GB, 200GB	More capacity for less space and power
Reliability	0.44% AFR (2M hours MTBF)	Reduced field replacement effort
	1E-17 bit error rate	Enhanced error detection and correction for optimal data integrity
	T10 end-to-end data protection	
	Exclusive-OR (XOR) NAND	Protection against Flash die failure
	Power loss data management	Assures data integrity during power failure
Integration	Unlimited reads, up to 29.2PB random writes (1600GB)	Maximum endurance over the life of SSD
	HDD architecture commonality	Compatibility with Ultrastar SAS HDDs
	Systems integration and test lab	Extensive interoperability and compliance testing

HGST Quality and Service

HGST's Ultrastar SSD1600MM family 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 complete portfolio of SSD/HDD solutions to satisfy today's monumental computing needs.

How to Read the Ultrastar Model Number

HUSMM1616ASS200 = 1600GB, SAS 12Gb/s

H = HGST
U = Ultrastar
S = Standard
MM = Multi level cell, mainstream endurance (10DW/D)
16 = Full capacity (1600GB)
16 = Capacity of this model (16 = 1600GB, 80 = 800GB, 40 = 400GB, etc.)
A = Generation code
S = Small form factor (vs. L for Large FF)
S2 = Interface, SAS 12Gb/s
0 = Reserved
0 = Crypto sanitize (1 = TCG encryption, 4 = No encryption, 5 = TCG + FIPS certified encryption)

Information and Technical Support

www.hgst.com (main website)
www.hgst.com/partners (partner website)

North America

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Toll Free: +1 888 426-5214, Direct: +1 408 717-8087

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Program Support

Partners First Program: channelpartners@hgst.com

Specifications

Model # / Part #	
HUSMM1616ASS204 / 0B32167	
HUSMM1616ASS200 / 0B31068	
HUSMM1616ASS201 / 0B32143	
HUSMM1616ASS205 / 0B32188	
HUSMM1680ASS204 / 0B32166	
HUSMM1680ASS200 / 0B31067	
HUSMM1680ASS201 / 0B32146	
HUSMM1680ASS205 / 0B32187	
HUSMM1640ASS204 / 0B32165	
HUSMM1640ASS200 / 0B31066	
HUSMM1640ASS201 / 0B32145	
HUSMM1640ASS205 / 0B32186	
HUSMM1620ASS204 / 0B32164	
HUSMM1620ASS200 / 0B31065	
HUSMM1620ASS201 / 0B32144	
HUSMM1620ASS205 / 0B32185	

Configuration	
Interface	SAS 12Gb/s
Capacity (GB) ¹ at 512 bytes/sector	1600 / 800 / 400 / 200
Form factor	2.5-inch
Flash memory technology	Multi Level Cell (MLC)

Performance	
Read throughput (max MB/s, sequential 64K)	1100
Write throughput (max MB/s, sequential 64K)	765
Read IOPS (max IOPS, random 4K)	130,000
Write IOPS (max IOPS, random 4K)	100,000

Reliability	
Error rate (non-recoverable bits read)	1 in 10 ¹⁷
MTBF ² (M hours)	2.0
Annual failure rate ² (AFR)	0.44%
Availability (hrs/day x days/wk)	24x7
Endurance (max PB ¹ , random write)	29.2 / 14.6 / 7.3 / 3.6

Power	
Requirement	+5 VDC (+/-5%) +12 VDC (+/-5%)
Operating (W, typical)	9.0 and 11.0
Idle (W)	2.2

Physical	
z-height (mm)	15.0
Dimensions (width x depth, mm)	70.1 x 100.6
Weight (g, max)	187

Environmental (operating)	
Ambient temperature	0° to 60°C
Shock (half-sine wave)	1000G (0.5ms) 500G (2ms)
Vibration, random (G RMS)	2.16, all axis (5 to 700 Hz)

¹ One gigabyte (GB) is equal to one billion bytes, one terabyte (TB) is equal to 1,000GB (one trillion bytes), and one petabyte (PB) is equal to 1,000TB (one quadrillion bytes) when referring to solid-state drive or hard drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the drive, the computer's operating system, and other factors.

² 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.

