Ultrastar® SSD1000MR

Highlights

- MLC NAND Flash for ultra-high performance and endurance
- Endurance: Two drive writes per day (DW/D) for five 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 Read endurance enterprise storage
- Enterprise-class servers and high performance computing
- Space and/or power constrained environments
- Video pre/post-production
- Cloud computing

1000GB, 500GB and 250GB | MLC
2.5-inch SFF | SAS 12Gb/s

Maximum Performance, Reliability and Endurance

The Ultrastar SSD1000MR delivers high sequential throughput, up to 1200MB/s read and 700MB/s write (12Gb/s SAS). The Ultrastar SSD1000MR also delivers up to 145,000 read and 20,000 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 SSD1000MR 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 SSD1000MR 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 SSD1000MR family achieves an extraordinary 0.44% annual failure rate (AFR) or two million hour mean-time-between-failure (MTBF). The 1000GB capacity model endures up to 3.7 Petabytes (PB) of random writes over the life of the drive—the equivalent of writing 2 Terabytes (TB) per day for five years.

For complete end-to-end data protection and reliability, the Ultrastar SSD1000MR 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 SSD1000MR family is backed by a five year limited warranty, or the maximum Petabytes (PB) written (based on capacity).

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® SSD1000MR 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.

HGST Quality and Service

HGST's Ultrastar SSD1000MR 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.

Features & Benefits

	Performance	Power	Capacity	Reliability	Integration
Feature/function	• SAS 12Gb/s • 1200MB/s / 700MB/s sequential R/W • 145K / 20K IOPS random R/W • 36K IOPS on 70/30 mix R/W	9.0 and 11.0 Watt options	• 1000GB • 500GB • 250GB	• 0.44% AFR (2M hours MTBF) • 1E-17 bit error rate • T10 end-to-end data protection • Exclusive-OR (XOR) NAND • Power loss data management • Unlimited reads, up to 3.7PB random writes (1000GB)	• HDD architecture commonality • Systems integration and test lab
Benefit	• 6Gb/s Active-Active Dual Port or 12Gb/s Single/Dual port for enhanced reliability • Highest write performance and endurance • Maximum throughput and IOPS for ultra-fast access to data; >100x faster than typical HDD	Improved performance with higher power option	More capacity for less space and power	• Reduced field replacement effort • Enhanced error detection and correction for optimal data integrity • Protection against flash die failure • Assures data integrity during power failure • Maximum endurance over the life of SSD	• Compatibility with Ultrastar SAS HDDs • Extensive interoperability and compliance testing

Ultrastar® SSD1000MR

Specifications

Model / Part No.

HUSMR1010ASS200 / 0B29689
HUSMR1050ASS200 / 0B29688
HUSMR1025ASS200 / 0B29687
HUSMR1010ASS201 / 0B29692
HUSMR1050ASS201 / 0B29691
HUSMR1025ASS201 / 0B29690
HUSMR1010ASS204 / 0B30148
HUSMR1050ASS204 / 0B30147
HUSMR1025ASS204 / 0B30146
HUSMR1010ASS205 / 0B30268
HUSMR1050ASS205 / 0B30267
HUSMR1025ASS205 / 0B30266

Configuration

Interface	SAS 12Gb/s
Capacity (GB[1]) at 512 bytes/sector	1000 / 500 / 250
Form factor	2.5-inch
Flash memory technology	Multi Level Cell (MLC)

Performance

Read throughput (max MB/s, sequential 64K)	1200
Write throughput (max MB/s, sequential 64K)	700
Read IOPS (max IOPS, random 4K)	145,000
Write IOPS (max IOPS, random 4K)	20,000

Reliability

Error rate (non-recoverable, bits read)	1 in 10^{17}
MTBF[2] (M hours)	2.0
Availability (hrs/day x days/wk)	24x7
Endurance (max PB[1], random write)	3.7 / 1.8 / 0.9

Power

Requirement	+5 VDC (+/-5%) +12VDC (+/-5%)
Operating (W)	9.0 and 11.0
Idle (W)	2.2 / 2.1 / 2.1

Physical

z-height (mm, max)	15.0
Dimensions (width x depth, mm)	70.1 x 100.6
Weight (g, typical)	164

Environmental (operating)

Ambient temperature	0° to 60° C
Shock (half-sine wave)	1000G (0.5ms) 500G (2ms)
Vibration, random (G RMS)	2.16, all axes (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 target 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.

How to Read the Ultrastar Model Number

HUSMR1010ASS200 = 1000GB, SAS 12Gb/s

H	=	HGST
U	=	Ultrastar
S	=	Standard
MR	=	Multi level cell, read intensive (2DW/D)
10	=	Full capacity (1000GB)
10	=	Capacity of this model (10 = 1000GB, 50 = 500GB, 25 = 250GB)
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)

References in this publication to HGST's products, programs or services do not imply that HGST intends to make these available in all countries in which it operates.

Product specifications provided are sample specifications and do not constitute a warranty. Information is true as of the date of publication and is subject to change. Actual specifications for unique part numbers may vary.

Please visit the Support section of our website www.hgst.com/support for additional information on product specifications. Photographs may show design models.

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