Enterprise Capacity 3.5 HDD (Helium)

Channel Data Sheet

Maximum Storage Capacity for Highest Rack Space Efficiency

- 10 TB per drive[1] for 25% more petabytes per rack[2]
- Industry's lowest power and weight for optimum data centre TCO
- Highest 10 TB HDD performance with enhanced caching, making it perfect for OLTP and HPC application
- Hyperscale SATA model tuned for large data transfers
- PowerBalance™ feature optimises IOPS/Watt
- Advanced Write Caching feature for 20% boost in random write performance[2]
- Forged, wrought-aluminium base and a helium sealed-drive design with no porosity and uniform density
- Superior material and weld-width design for a more robust, hermetically sealed-drive enclosure that protects from helium leaks
- Digital environmental sensors for measuring internal humidity, pressure and temperature, helping to ensure high reliability, performance and quality
- Latest hermetic interconnect technology supporting higher data rate heads and higher pin counts for extreme thermal conditions
- Proven enterprise-class reliability backed by 2.5M-hr MTBF

Best-Fit Applications

- Hyperscale applications/cloud data centres
- Massive scale-out data centres
- OLTP and HPC applications
- High-capacity density RAID storage
- Mainstream enterprise external storage arrays
- Distributed file systems, including Hadoop and Ceph
- Enterprise backup and restore — D2D, virtual tape
- Centralised surveillance

1 Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full capacity capabilities.

2 Compared to 8 TB competitive product.

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Specifications	SATA 6 Gb/s Hyperscale		SATA 6 Gb/s Standard	
Capacity	10TB	8TB	10TB	8TB
Standard Model (512e)[1]	—	—	ST10000NM0086	ST8000NM0206
Hyperscale Model (512e)[1]	ST10000NM0016	ST8000NM0016	—	—
Standard Model (4Kn)[1]	—	—	ST10000NM0146	—
SED Model (512e)[1, 2]	—	—	ST10000NM0156	—
SED Model (4Kn)[1, 2]	—	—	ST10000NM0166	—
SED-FIPS Model (512e)[1, 2, 3]	—	—	ST10000NM0176	—
SED-FIPS Model (4Kn)[1, 2, 3]	—	—	ST10000NM0186	—
Features				
Helium Sealed-Drive Design With Wide Weld	Yes	Yes	Yes	Yes
Digital Environmental Sensors	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	—	—	—
SuperParity	Yes	Yes	Yes	Yes
PowerChoice™/PowerBalance™ Technology	Yes	Yes	Yes	Yes
Low Halogen/Hot-Plug Support[4]	Yes	Yes	Yes	Yes
Cache, Multi-segmented (MB)	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes
Reliability/Data Integrity				
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000	2,500,000	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24×7)	8,760	8,760	8,760	8,760
512e Sector Size (Bytes per Sector)	512	512	512	512
4Kn Sector Size (Bytes per Sector)	—	—	4,096	4,096
Limited Warranty (years)	5	5	5	5
Performance				
Spindle Speed (RPM)	7,200	7,200	7,200	7,200
Interface Access Speed (Gb/s)	6.0, 3.0, 1.5	6.0, 3.0, 1.5	6.0, 3.0, 1.5	6.0, 3.0, 1.5
Max. Sustained Transfer Rate OD (MB/s)	249MB/s	249MB/s	249MB/s	249MB/s
Random Read/Write 4K QD16 WCD (IOPS)	170, 138	170, 138	170, 370	170, 370
Average Latency (ms)	4.16	4.16	4.16	4.16
Interface Ports	Single	Single	Single	Single
Rotational Vibration @ 1,500 Hz (rad/s²)	12.5	12.5	12.5	12.5
Power Consumption				
Idle A (W) Average	4.5 W	4.5 W	4.5 W	4.5 W
Max Operating Power, Random Write (WCD) 4K/4Q RR50% / RW50%	8.0	8.0	8.0	8.0
Max Operating Power, Random Read 4K/16Q (W)	8.4	8.4	8.4	8.4
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V
Environmental				
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C	5°C – 60°C	5°C – 60°C
Vibration, Non-operating: 10 Hz to 500 Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2 ms (Read/Write) (Gs)	70/40 Gs	70/40 Gs	70/40 Gs	70/40 Gs
Shock, Non-operating, 1 ms/2 ms (Gs)	250	250	250	250
Physical				
Height (mm/in, max)[5]	26.11 mm/1.028 in	26.11 mm/1.028 in	26.11 mm/1.028 in	26.11 mm/1.028 in
Width (mm/in, max)[5]	101.85 mm/4.01 in	101.85 mm/4.01 in	101.85 mm/4.01 in	101.85 mm/4.01 in
Depth (mm/in, max)[5]	147 mm/5.787 in	147 mm/5.787 in	147 mm/5.787 in	147 mm/5.787 in
Weight (lb/g)	650 g/1.433 lb	650 g/1.433 lb	650 g/1.433 lb	650 g/1.433 lb
Carton Unit Quantity	20	20	20	20
Cartons per Pallet / Cartons per Layer	40/8	40/8	40/8	40/8

1 Invoice SPA required for most SED and SED-FIPS models.
2 Self-Encrypting Drives (SED) and FIPS 140-2 Validated drives are not available in all models or countries. May require TCG-compliant host or controller support.
3 See FIPS 140-2 Level 2 Certificate at: http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1635.

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Specifications	12 Gb/s SAS Standard	
Capacity	10TB	8TB
Standard Model (512e)[1]	ST10000NM0096	ST8000NM0156
Hyperscale Model (512e)[1]	—	—
Standard Model (4Kn)[1]	ST10000NM0206	—
SED Model (512e)[1, 2]	ST10000NM0216	—
SED Model (4Kn)[1, 2]	ST10000NM0226	—
SED-FIPS Model (512e)[1, 2, 3]	ST10000NM0236	—
SED-FIPS Model (4Kn)[1, 2, 3]	ST10000NM0246	—
Features		
Helium Sealed-Drive Design With Wide Weld	Yes	Yes
Digital Environmental Sensors	Yes	Yes
Protection Information (T10 DIF)	Yes	Yes
SuperParity	Yes	Yes
PowerChoice™/PowerBalance™ Technology	Yes	Yes
Low Halogen/Hot-Plug Support[4]	Yes	Yes
Cache, Multi-segmented (MB)	256	256
Organic Solderability Preservative	Yes	Yes
Reliability/Data Integrity		
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24×7)	8,760	8,760
512e Sector Size (Bytes per Sector)	512, 520, 528	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4,096, 4,160, 4,224	4,096, 4,160, 4,224
Limited Warranty (years)	5	5
Performance		
Spindle Speed (RPM)	7,200	7,200
Interface Access Speed (Gb/s)	12.0, 6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s)	249MB/s	249MB/s
Random Read/Write 4K QD16 WCD (IOPS)	170, 370	170, 370
Average Latency (ms)	4.16	4.16
Interface Ports	Dual	Dual
Rotational Vibration @ 1,500 Hz (rad/s²)	12.5	12.5
Power Consumption		
Idle A (W) Average	5.5 W	5.5 W
Max Operating Power, Random Write (WCD) 4K/4Q RR50% / RW50%	9.0	9.0
Max Operating Power, Random Read 4K/16Q (W)	9.4	9.4
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V
Environmental		
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C
Vibration, Non-operating: 10 Hz to 500 Hz (Grms)	2.27	2.27
Shock, Operating 2 ms (Read/Write) (Gs)	70/40 Gs	70/40 Gs
Shock, Non-operating, 1 ms/2 ms (Gs)	250	250
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Weight (lb/g)	650 g/1.433 lb	650 g/1.433 lb
Carton Unit Quantity	20	20
Cartons per Pallet / Cartons per Layer	40/8	40/8

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