Seagate

Data Sheet

Constellation® ES

High-capacity storage designed for seamless enterprise integration

Key Advantages

- Fifth-generation, enterprise, nearline drive designed for 24×7 operation

- Up to 2TB of capacity for data-hungry enterprise business applications

- Best-in-class rotational vibration tolerance ensures unrivalled performance in high-density applications requiring continuous data access

- Enhanced efficiencies with PowerChoice™ host-selectable power options for unprecedented savings during slow or idling periods

- Seagate RAID Rebuild™ development platform significantly reduces hours of lost productivity

- Multi-drive firmware maximised for enterprise system availability

- 6Gb/s SAS performance with error detection and correction (IOEDC/IOECC) capabilities and PI (Protection Information)

- Self-Encrypting Drive (SED) option cuts IT drive retirement expenses while protecting data securely and is one of the easiest, most cost-effective security measures you can implement[1]

- FIPS Self-Encrypting Drive option provides all the benefits of SED and is NIST certified to meet US, Canadian and UK government data encryption compliance requirements[1, 2]

Best-fit Applications

- High-capacity data centre storage

- Mainstream enterprise external storage arrays

- Enterprise backup and restore

- Cloud storage

[1] Self-Encrypting Drive (SED) and FIPS Self-Encrypting Drive options require TCG-compliant host or controller support. Not available in all countries.
[2] See FIPS 140-2 Level 2 Certificate at http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1636

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Specifications	6Gb/s SAS			SATA 6Gb/s		
	2TB[1]	1TB[1]	500GB[1]	2TB[1]	1TB[1]	500GB[1]
Standard Model	ST2000NM0001[6]	ST1000NM0001[6]	ST500NM0001[6]	ST2000NM0011	ST1000NM0011	ST500NM0011
SED 256 Model	ST2000NM0021[2]	ST1000NM0021[2]	ST500NM0021[2]	ST2000NM0031[2]	ST1000NM0031[2]	ST500NM0031[2]
SED 128 with FIPS Model	ST2000NM0041[3]	ST1000NM0041[3]	ST500NM0041[3]	ST2000NM0051[3]	ST1000NM0051[3]	ST500NM0051[3]
Features						
Protection Information	Yes[6]	Yes[6]	Yes[6]	—	—	—
Low Halogen	Yes	Yes	Yes	Yes	Yes	Yes
Self-Encrypted Drive (SED) Option	Yes	Yes	Yes	Yes	Yes	Yes
Configuration/Organisation						
Bytes per Sector	512, 520, 528	512, 520, 528	512, 520, 528	512	512	512
Reliability/Data Integrity						
Power-On Hours (annual)	8,760	8,760	8,760	8,760	8,760	8,760
Mean Time Between Failures (MTBF, hours)	1.2 million	1.2 million	1.2 million	1.2 million	1.2 million	1.2 million
Reliability Rating at Full 24×7 Operation (AFR)	0.73%	0.73%	0.73%	0.73%	0.73%	0.73%
Non-recoverable Read Errors per Bits Read	1 sector per 10^{15}	1 sector per 10^{15}	1 sector per 10^{15}	1 sector per 10^{15}	1 sector per 10^{15}	1 sector per 10^{15}
IOEDC (I/O Error Dectection Code)	Reads/Writes	Reads/Writes	Reads/Writes	Reads/Writes	Reads/Writes	Reads/Writes
IOECC (I/O Error Correction Code)	Reads/Writes	Reads/Writes	Reads/Writes	Writes	Writes	Writes
Load/Unload Cycles (at 40°C)	300,000	300,000	300,000	300,000	300,000	300,000
Interface Ports	Dual	Dual	Dual	Single	Single	Single
Limited Warranty (years)[4]	5	5	5	5	5	5
Performance						
Spindle Speed (RPM)	7,200	7,200	7,200	7,200	7,200	7,200
Seek Time, Average Read/Write (ms)	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5
Max Sustained Transfer Rate (MB/s)	150	150	150	140	140	140
Cache, Multi-segmented (MB)	64	64	64	64	64	64
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	6.0, 3.0, 1.5	6.0, 3.0, 1.5
Rotational Vibration @ 1,500Hz(rad/s²)	12.5	12.5	12.5	12.5	12.5	12.5
Power Management						
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V
Idling (W)	7.26	5.41	4.67	6.39	4.61	3.74
Typical Operating Power (W)						
Random Read	10.43	8.04	7.89	9.03	7.42	6.47
Random Write	10.15	7.28	7.18	7.80	6.21	5.31
PowerChoice™ Option (W)	As low as 1.39	As low as 1.34	As low as 1.44	As low as 0.53	As low as 0.57	As low as 0.55
Environmental						
Operating Temperature Range (°C)	5 to 60	5 to 60	5 to 60	5 to 60	5 to 60	5 to 60
Vibration (Gs)						
Operating: 5 to 500Hz	0.5	0.5	0.5	0.25	0.25	0.25
Non-operating: 10 to 500Hz	2.0	2.0	2.0	4.9	4.9	4.9
Shock (Gs)						
Operating, 2ms	70	70	70	70	70	70
Non-operating: 1ms and 2ms	300	350	350	300	350	350
Physical						
Height (in/mm)[5]	1.028/26.11	1.028/26.11	1.028/26.11	1.028/26.11	1.028/26.11	1.028/26.11
Width (in/mm)[5]	4.010/101.85	4.010/101.85	4.010/101.85	4.010/101.85	4.010/101.85	4.010/101.85
Depth (in/mm)[5]	5.787/147.00	5.787/147.00	5.787/147.00	5.787/147.00	5.787/147.00	5.787/147.00
Weight (lb/g)	1.57/712	1.41/640	1.34/608	1.57/712	1.411/640	1.345/610
Carton Unit Quantity	20	20	20	20	20	20
Cartons per Pallet	40	40	40	40	40	40
Cartons per Layer	8	8	8	8	8	8

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FIPS 140-2 INSIDE