



800GB-15.36TB,
TLC 2.5-inch SSF, SAS 12Gb/s

Maximize Storage and Server Scalability with SAS SSDs

Data is transforming the world and growing at an exponential pace. The SAS interface continues its dominance in traditional enterprise storage arrays, making the ever-increasing volume of data rapidly and reliably available. Storage solutions depend on SAS's protection features, such as dual-port failover for redundancy, and SAS's high reliability to power mission-critical applications such as ERP, OLTP, OLAP, and more.

Ultrastar® DC SS540, Western Digital's 6th generation of SAS SSD drive, delivers performance to data centers with 96-layer 3D NAND technology and a proven track record of reliability. Designed with a dual-port 12Gb/s SAS interface for seamless integration into data center environments, the Ultrastar DC SS540 SAS SSD is available in capacities from 800GB to 15.36TB¹. Achieving exceptional performance by delivering up to 470K/240K Random Read/Random Write IOPS, the DC SS540 offers the best value for data centers by providing dual/single port support, desired features, power options, multiple endurance SKUs and mainstream capacities. It is ideal for ultra high-performance tier-0 enterprise storage, high performance computing (HPC), and software-defined storage (SDS).

Highlights

- 3rd generation 96-layer 3D TLC NAND flash for performance and endurance
- 12Gb/s SAS interface for maximum throughput
- Advanced power-loss and data-management technology
- Self-encrypting models conform to TCG's Enterprise specifications

Applications

- Ultra-high performance tier-0 enterprise storage
- Enterprise-class servers and high performance computing (HPC)
- Software-defined storage (SDS)
- Online transaction processing (OLTP)
- Finance and e-commerce
- Database analytics

Proven Architecture with Industry-Leading Quality and Reliability

Ultrastar DC SS540, with 96-layer 3D TLC NAND flash, leverages the proven architecture of the prior generations of SAS to achieve an extraordinary 0.35% annual failure rate (AFR) or 2.5 million hours mean-time-between-failure (MTBF). DC SS540 offers two endurance options of 1 and 3 drive writes per day (DW/D) to meet the most stringent data center requirements.

Help keep confidential data secure by deploying self-encrypting drive technology that supports Trusted Computing Group (TCG) Enterprise standards for security services and FIPS 140-2 validation for cryptographic-enabled drives that are required for certain government applications. The Ultrastar DC SS540 is backed by a five-year limited warranty or the maximum petabytes (PB) written (based on capacity), whichever comes first.

Trust Your Storage Systems with SSD Products Developed by Experts in Enterprise Storage

Ultrastar SAS SSDs leverage decades of proven enterprise storage expertise in Serial Attached SCSI (SAS) design, reliability, firmware, customer qualification, and system integration to provide end-to-end data protection storage for data centers. The synergistic relationship between throughput-enhancing SSDs and traditional HDDs provides cost-effective option that delivers reliability, compatibility, capacity, cost savings, and system performance. Ultrastar SAS SSD drives are the ideal choice to help meet escalating reliability, endurance, and performance requirements in the most demanding data center environments.

Features and Benefits

	Feature / Function	Benefits
Performance	<ul style="list-style-type: none"> • SAS 12Gb/s interface • 3D TLC NAND flash memory • Up to 2130 / 2109 MiB/s sequential R/W • Up to 470K / 240K IOPS random R/W 	<ul style="list-style-type: none"> • 12G Active-Active Dual port and 12G single/dual port for enhanced reliability • High read/write performance • Maximum throughput and IOPS for ultra-fast access to data
Power	<ul style="list-style-type: none"> • 9, 11 and 14 Watt options 	<ul style="list-style-type: none"> • Higher IOPS performance with higher power options
Capacity	<ul style="list-style-type: none"> • 800GB to 15.36TB 	<ul style="list-style-type: none"> • High capacity in standard form factor with lower Watts/TB
Reliability	<ul style="list-style-type: none"> • 0.35% AFR (2.5M hours MTBF) • 1E-17 bit error rate • Power loss data management • Unlimited reads, up to 59PB writes • T10 end-to-end data protection 	<ul style="list-style-type: none"> • Reduced field replacement effort • Enhanced error detection and correction for optimal data integrity • Assures data integrity during power failure • Support for extreme write-intensive applications • Protection against flash die failures
Security Features	<ul style="list-style-type: none"> • Instant Secure Erase models (Crypto Sanitize) • TCG + FIPS (forthcoming) encryption models 	<ul style="list-style-type: none"> • Enables swift drive redeployment and retirement • Hardware-based encryption helps protect data from unauthorized use

Ultrastar® DC SS540 Specifications

Configuration	3DW/D	3DW/D	3DW/D	3DW/D	1DW/D	1DW/D	1DW/D	1DW/D	1DW/D
Model Number	WUSTR6464ABSS20x	WUSTR6432BSS20x	WUSTR6416BSS20x	WUSTR6480BSS20x	WUSTVA1A1BSS20x	WUSTVA176BSS20x	WUSTVA138BSS20x	WUSTVA119BSS20x	WUSTVA196BSS20x
Capacity ¹	6.4TB	3.2TB	1.6TB	800GB	15.36TB	7.68TB	3.84TB	1.92TB	960GB
Endurance (Drive Writes per Day- DW/D) ²	3	3	3	3	1	1	1	1	1
Max Terabytes Written (TBW) ²	36,150	17,510	9,410	4,700	30,110	15,050	7,000	3,760	1,880
Interface	SAS 6/12Gb/s supports Wide port @ 12Gb/s								
Form Factor	2.5-inch 15mm SFF								
Flash Memory Technology	3D TLC NAND								

Performance

Read Throughput (max MiB/s, Sequential 128KiB)	2,130	2,130	2,116	2,130	2,130	2,130	2,119	1,992	1,985
Write Throughput (max MiB/s, Sequential 128KiB)	2,109	2,102	1,780	1,008	1,104	2,101	2,045	1,677	1,024
Read IOPS (max, Random 4KiB)	470,000	470,000	389,000	237,000	441,000	470,000	470,000	370,000	237,000
Write IOPS (max, Random 4KiB)	240,000	228,000	184,000	128,000	110,000	110,000	99,466	79,055	88,133
Mixed IOPS (70/30 R/W, max, 4KiB)	300,000	297,311	260,103	182,685	188,906	200,000	185,662	151,386	142,959
Read/Write Latency ⁴ (µs, avg)	150/80	150/70	140/70	140/60	150/300	150/200	140/200	140/110	140/90

Reliability

Unrecoverable Bit Error Rate (UBER)	1 in 10 ¹⁷
MTBF ⁵ (M hours)	2.5
Annualized Failure Rate ⁵ (AFR)	0.35%
Availability (hrs/day x days/wk)	24x7
Limited Warranty ⁶	5 years

Power

Requirement (+/- 5%)	+5 VDC, +12VDC
Operating Modes (W, typical)	9, 11, 14
Idle (W, max) (Projected)	<15TB: 3.7W, >15TB: 4.7W

Physical Size

z-height (mm)	15
Dimensions (width x depth, mm)	70.1 x 100.45
Weight (g, max)	175

Environmental

Operating Temperature ⁷	0°C to 70°C
Non-operating Temperature	-40°C to 80°C

¹ One megabyte (MB) is equal to one million bytes, one gigabyte (GB) is equal to 1,000MB (one billion bytes), and one terabyte (TB) is equal to 1,000GB (one trillion bytes) when referring to storage capacity. Accessible capacity may be less due to operating environment.

² Endurance rating based on DW/D using 8KiB random write workload over 5 years.

³ Based on internal testing. Performance will vary by capacity point, or with the changes in useable capacity. Consult product manual for further details. All performance measurements are in full sustained mode and are peak values. Subject to change.

⁴ Average R/W latency at 4KiB QD=1.

⁵ MTBF and AFR specifications are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions for this drive model. MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

⁶ The warranty for the product will expire on the earlier of (i) the date when the flash media has reached one-percent (1%) of its remaining life or (ii) the expiration of the time period associated with the product.

⁷ Internal drive temperature as measured via the drive's temperature sensor.

How to Read Model Number

Example: WUSTR6464ASS201=6.4TB, SAS 12Gb/s, TCG

W = Western Digital	A = Generation code
U = Ultrastar	S = Small form factor (2.5" SFF)
S = Standard	S2 = Interface, SAS 12Gb/s
TR = NAND type/endurance	1 = Encryption setting
(TM=TLC/mainstream endurance,	0 = Instant Secure Erase
TR=TLC/read-intensive)	1 = TCG Enterprise encryption
64 = Full capacity (6.4TB)	4 = No encryption/Secure Erase
64 = Capacity of this model	5 = TCG+FIPS
15 = 15.2TB	
76 = 7.6TB	
38 = 3.84TB	
32 = 3.2TB	
19 = 1.92TB	
16 = 1.6TB	
96 = 960GB	
80 = 800GB	
48 = 480GB	
40 = 400GB	

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