

ThinkSystem SS530 Performance SAS 12Gb SSDs Product Guide (withdrawn product)

The ThinkSystem SS530 Performance SAS 12Gb SSDs use second generation 3D TLC NAND flash memory technology with a 12 Gb SAS interface to provide a high-performance storage solution in either 2.5-inch or 3.5-inch drive form factor.

The 12 Gb SAS drives with 10 full drives writes per day (DWPD) are an excellent choice for applications demanding high write performance, such as High Performance Computing (HPC), High Definition Imaging and Video (HDIV), high data rate analytics and databases, large-scale virtualization, and video on demand content delivery.



Figure 1. ThinkSystem SS530 Performance SAS 12Gb SSDs (without the Lenovo label and hot-swap tray)

Did you know?

These drives offer very high random read & write performance (IOPS) and very high throughput (MBps) making them ideal for high-performance dynamic data caching applications. The drives also offer a 12 Gb SAS interface which means they are the best selection for multi-threaded applications.

Rigorous testing of SS530 Performance SSDs by Lenovo through the ServerProven program ensures a high degree of storage subsystem compatibility and reliability. Providing additional peace of mind, these drives are covered under Lenovo warranty.

Part number information

The following table lists the information for ordering part numbers and feature codes for ThinkSystem servers.

Withdrawn from marketing: Add drives listed in this product guide are now withdrawn from marketing.

Table 1. Ordering information - ThinkSystem

Part number	Feature code	Description
2.5-inch hot-swap drives		
4XB7A10219	B4Y4	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD
4XB7A10230	B4Y5	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD
4XB7A10231	B4Y6	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD
4XB7A10232	B4Y7	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD
3.5-inch hot-swap drives		
4XB7A10234	B4Y8	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD
4XB7A10235	B4Y9	ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD
4XB7A10236	B4YA	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD

Features

The ThinkSystem SS530 Performance SAS 12Gb SSDs have the following features:

- Industry-standard 2.5-inch drive with 2.5-inch or 3.5-inch drive tray attached
- Based on proven Western Digital Ultrastar SS530 drive technology
- Uses second-generation 3D Triple Level Cell (TLC) NAND flash memory
- Endurance of up to 10 drive writes per day (DWPD) for 5 years.
- High reliability and enhanced ruggedness
- Energy saving, with 9 W typical power consumption per drive
- Absence of moving parts to reduce potential failure points in the server
- S.M.A.R.T. support
- Advanced Encrypting Standard (AES) 256-bit encryption
- Supports Instant Secure Erase (ISE)
- Full end-to-end data path protection
 - 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
 - Power loss data management without the need for a supercapacitor

The key difference between Performance SSDs such as the SS530 SSDs described here and Entry and Mainstream SSDs, is their endurance (life expectancy). SSDs have a huge, but finite, number of program/erase (P/E) cycles, which determines how long the drives can perform write operations and thus their life expectancy. Performance SSDs have better endurance than the Mainstream and Entry SSDs, but at a higher cost/IOPS ratio.

SSD write endurance is typically measured by the number of program/erase cycles that the drive can incur over its lifetime, which is listed as TBW in the device specification. The TBW value that is assigned to a solid-state device is the total bytes of written data that a drive can be guaranteed to complete. Reaching this limit does not cause the drive to immediately fail; the TBW simply denotes the maximum number of writes that can be guaranteed.

A solid-state device does not fail upon reaching the specified TBW, but at some point after surpassing the TBW value (and based on manufacturing variance margins), the drive reaches the end-of-life point, at which time the drive goes into read-only mode. Because of such behavior, careful planning must be done to use SSDs in the application environments to ensure that the TBW of the drive is not exceeded before the required life expectancy.

For example, the SS530 1.6TB drive has an endurance of 29.41 PB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 16.12 TB of writes per day, which is equivalent to 10.1 full drive writes per day (DWPD). For the device to last three years, the drive write workload must be limited to no more than 26.86 TB of writes per day, which is equivalent to 16.8 full drive writes per day.

Technical specifications

The following table presents technical specifications for the SS530 Performance SAS 12Gb SSDs.

Table 2. Technical specifications

Feature	400 GB drive	800 GB drive	1.6 TB drive	3.2 TB drive
WD part numbers	WUSTM3240ASS200	WUSTM3280ASS200	WUSTM3216ASS200	WUSTM3232ASS200
Interface	12 Gbps SAS	12 Gbps SAS	12 Gbps SAS	12 Gbps SAS
Capacity	400 GB	800 GB	1.6 TB	3.2 TB
SED encryption	None	None	None	None
Endurance (drive writes per day over 5 years)	10 DWPD	10 DWPD	10 DWPD	10 DWPD
Endurance (total bytes written)	7.63 PB	15.22 PB	29.41 PB	59.69 PB
Data reliability	1 in 10 ¹⁷ bits read	1 in 10 ¹⁷ bits read	1 in 10 ¹⁷ bits read	1 in 10 ¹⁷ bits read
MTBF	2,500,000 hours	2,500,000 hours	2,500,000 hours	2,500,000 hours
IOPS reads (4 KB blocks, QD 128)	239,500	239,500	239,700	239,900
IOPS writes (4 KB blocks, QD 16)	170,700	170,300	170,400	170,000
Sequential read rate (128 KB blocks)	1070 MBps	1070 MBps	1070 MBps	1070 MBps
Sequential write rate (128 KB blocks)	1070 MBps	1050 MBps	1050 MBps	900 MBps
Latency (R/W)	92 / 26 μ s	92 / 26 μ s	92 / 26 μ s	92 / 26 μ s
Shock, operating	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms
Vibration, operating	3.1 G _{RMS} (5-700 Hz)	3.1 G _{RMS} (5-700 Hz)	3.1 G _{RMS} (5-700 Hz)	3.1 G _{RMS} (5-700 Hz)
Typical power	9 W	9 W	9 W	9 W

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 3. Server support (Part 1 of 4)

Part Number	Description	AMD V3				2S Intel V3/V4						4S 8S Intel V3			Multi Node V3/V4			1S V3			
		SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	ST650 V3 (7D7B / 7D7A)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR630 V4 (7DG8 / 7DG9)	SR650 V4 (7DGC / 7DGD)	SR650a V4 (7DGC / 7DGD)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SR950 V3 (7DC5 / 7DC4)	SD535 V3 (7DD8 / 7DD1)	SD530 V3 (7DDA / 7DD3)	SD550 V3 (7DD9 / 7DD2)	ST45 V3 (7DH4 / 7DH5)	ST50 V3 (7DF4 / 7DF3)	ST250 V3 (7DCF / 7DCE)	SR250 V3 (7DCM / 7DCL)
2.5-inch hot-swap drives																					
4XB7A10219	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10230	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10231	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10232	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch hot-swap drives																					
4XB7A10234	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10235	ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10236	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 4. Server support (Part 2 of 4)

Part Number	Description	GPU Rich					Edge					Super Computing							
		SR670 V2 (7Z22 / 7Z23)	SR675 V3 (7D9Q / 7D9R)	SR680a V3 (7DHE)	SR685a V3 (7DHC)	SR780a V3 (7DJ5)	SE100 (7DGR)	SE350 (7Z46 / 7D1X)	SE350 V2 (7DA9)	SE360 V2 (7DAM)	SE450 (7D8T)	SE455 V3 (7DBY)	SC750 V4 (7DDJ)	SC777 V4 (7DKA)	SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	SD650-N V3 (7D7N)
2.5-inch hot-swap drives																			
4XB7A10219	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10230	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10231	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10232	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch hot-swap drives																			
4XB7A10234	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10235	ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10236	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 5. Server support (Part 3 of 4)

Part Number	Description	1S Intel V2			2S Intel V2			AMD V1				Dense V2			4S V2	8S		
		ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR635 (7Y98 / 7Y99)	SR655 (7Y00 / 7Z01)	SR655 Client OS	SR645 (7D2Y / 7D2X)	SR665 (7D2W / 7D2V)	SD630 V2 (7D1K)	SD650 V2 (7D1M)	SD650-N V2 (7D1N)	SN550 V2 (7Z69)	SR850 V2 (7D31 / 7D32)	SR860 V2 (7Z59 / 7Z60)
2.5-inch hot-swap drives																		
4XB7A10219	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y
4XB7A10230	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y
4XB7A10231	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y
4XB7A10232	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y
3.5-inch hot-swap drives																		
4XB7A10234	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
4XB7A10235	ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
4XB7A10236	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N

Table 6. Server support (Part 4 of 4)

Part Number	Description	4S V1			1S Intel V1			2S Intel V1						Dense V1						
		SR850 (7X18 / 7X19)	SR850P (7D2F / 2D2G)	SR860 (7X69 / 7X70)	ST50 (7Y48 / 7Y50)	ST250 (7Y45 / 7Y46)	SR150 (7Y54)	SR250 (7Y52 / 7Y51)	ST550 (7X09 / 7X10)	SR530 (7X07 / 7X08)	SR550 (7X03 / 7X04)	SR570 (7Y02 / 7Y03)	SR590 (7X98 / 7X99)	SR630 (7X01 / 7X02)	SR650 (7X05 / 7X06)	SR670 (7Y36 / 7Y37)	SD530 (7X21)	SD650 (7X58)	SN550 (7X16)	SN850 (7X15)
2.5-inch hot-swap drives																				
4XB7A10219	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
4XB7A10230	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
4XB7A10231	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
4XB7A10232	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
3.5-inch hot-swap drives																				
4XB7A10234	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N
4XB7A10235	ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N
4XB7A10236	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N

Storage controller support

The ThinkSystem SS530 Performance SAS 12Gb SSDs require a SAS controller. Check the relevant server product guide for the supported SAS controllers.

Operating system support

SAS and SATA SSDs operate transparently to users, storage systems, applications, databases, and operating systems.

Operating system support is based on the controller used to connect to the drives. Consult the controller product guide for more information:

- RAID controllers: <https://lenovopress.com/servers/options/raid>
- SAS HBAs: <https://lenovopress.com/servers/options/hba>

Warranty

ThinkSystem SS530 Performance SAS 12Gb SSDs carry a one-year, customer-replaceable unit (CRU) limited warranty. When the SSDs are installed in a supported server, these drives assume the system's base warranty and any warranty upgrades.

Solid State Memory cells have an intrinsic, finite number of program/erase cycles that each cell can incur. As a result, each solid state device has a maximum amount of program/erase cycles to which it can be subjected. The warranty for Lenovo solid state drives (SSDs) is limited to drives that have not reached the maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the SSD product. A drive that reaches this limit may fail to operate according to its Specifications.

Physical specifications

ThinkSystem SS530 Performance SAS 12Gb SSDs have the following physical specifications, without drive tray:

- Height: 15 mm (0.6 inches)
- Width: 70 mm (2.8 inches)
- Depth: 100 mm (4.0 inches)
- Weight: 175 g (6.2 ounces)

Operating environment

ThinkSystem SS530 Performance SAS 12Gb SSDs are supported in the following environment:

- Temperature, operational: 0 to 75° C (32 to 167° F)
- Temperature, shipping: -40 to 85° C (-40 to 185° F)
- Relative humidity: 5 to 95% (noncondensing)
- Maximum altitude: 3,050 m (10,000 ft)

Agency approvals

ThinkSystem SS530 Performance SAS 12Gb SSDs conform to the following regulations:

- FCC Title 47, Part 15B, Class B
- CA/CSA-CEI/IEC CISPR 22:02
- EN 55024: 1998
- EN 55022: 2006
- EN-60950-1 2nd Edition
- UL/CSA EN-60950-1 2nd Edition
- Low Voltage Directive 2006/95/EC
- C-Tick: AS/NZS3584
- VCCI V-3/2013-04 Class B
- CNS 13438: 2006
- KCC Article 11.1
- RoHS DIRECTIVE 2011/65/EU
- REACH 1907/2006
- WEEE Directive 2002/96/EC

Related publications and links

For more information, see the following documents:

- Lenovo ThinkSystem storage options product page
<https://lenovopress.com/lp0761-storage-options-for-thinksystem-servers>
- Western Digital Ultrastar SS530 SAS SSD datasheet
https://documents.westerndigital.com/content/dam/doc-library/en_us/assets/public/western-digital/product/data-center-drives/ultrastar-ssd-sas-series/data-sheet-ultrastar-dc-ss530.pdf
- Lenovo ServerProven
<http://www.lenovo.com/us/en/serverproven>

Related product families

Product families related to this document are the following:

- [Drives](#)

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