

## ThinkSystem S4520 Read Intensive SATA 6Gb SSDs Product Guide

The ThinkSystem S4520 Read Intensive SATA SSDs use 144-layer Intel 3D NAND TLC Flash Memory technology with a 6Gbps SATA interface to provide an affordable solution with industry leading performance.

Compared with the S4510 series, these new Read Intensive (Entry) drives offer improved endurance. The S4520 SSDs are optimized for read-intensive applications such as boot, web servers, lower data rate operational databases and analytics.



Figure 1. ThinkSystem S4520 Read Intensive SATA 6Gb SSD (without the hot-swap drive tray)

### Did you know?

By combining the latest Intel 3D NAND TLC Flash Memory technology with Intel's latest controller technology, the design of the S4520 SSDs delivers consistent performance, reduced power consumption, and end-to-end data protection, as well as being optimized for IOPS/watt and cost/IOPS.

Rigorous testing of S4520 SSDs by Lenovo through the ServerProven program assures 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 ordering information for drives for ThinkSystem servers.

Table 1. Ordering information

Part number	Feature	Description
<b>2.5-inch hot-swap 6 Gb SATA SSDs</b>		
4XB7A17072	B99D	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD
4XB7A17105	BK78	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD
<b>7mm 2.5-inch hot-swap 6 Gb SATA SSDs</b>		
4XB7A17106	BK79	ThinkSystem 7mm S4520 240GB Read Intensive SATA 6Gb HS SSD
4XB7A17107	BK7A	ThinkSystem 7mm S4520 480GB Read Intensive SATA 6Gb HS SSD
4XB7A17108	BK7B	ThinkSystem 7mm S4520 960GB Read Intensive SATA 6Gb HS SSD
4XB7A78622	BM8E	ThinkSystem 7mm S4520 1.92TB Read Intensive SATA 6Gb HS SSD
4XB7A78624	BM8C	ThinkSystem 7mm S4520 7.68TB Read Intensive SATA 6Gb HS SSD
<b>3.5-inch hot-swap 6 Gb SATA SSDs</b>		
4XB7A17118	BA7K	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD
4XB7A17119	BA7L	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD
4XB7A17120	BA7M	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD
4XB7A17121	BA7N	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD
4XB7A17122	BK7F	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD
4XB7A17123	BK7G	ThinkSystem 3.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD
<b>3.5-inch simple-swap 6 Gb SATA SSDs</b>		
4XB7A17109	BK7C	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb SS SSD
4XB7A17110	BK7D	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD
4XB7A17111	BK7E	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD
<b>2.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>		
4XB7A77459	BMEB	ThinkSystem ST50 V2 2.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD
4XB7A77460	BMEA	ThinkSystem ST50 V2 2.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD
4XB7A77461	BME9	ThinkSystem ST50 V2 2.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>		
4XB7A77454	BME2	ThinkSystem ST50 V2 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD
4XB7A77455	BME6	ThinkSystem ST50 V2 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD
4XB7A77456	BME5	ThinkSystem ST50 V2 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 server</b>		
4XB7A76940	BKAC	ThinkSystem ST50 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD
4XB7A76941	BKAB	ThinkSystem ST50 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD
4XB7A76942	BKAA	ThinkSystem ST50 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD
<b>Trayless drives for ThinkSystem SD650 V2 and SD650-N V2 servers</b>		

Part number	Feature	Description
4XB7A77056	BKST	ThinkSystem Intel S4520 2.5" 7mm 240GB Entry SATA 6Gb Non-Hot Swap SSD Trayless
4XB7A77057	BKSU	ThinkSystem Intel S4520 2.5" 7mm 480GB Entry SATA 6Gb Non-Hot Swap SSD Trayless
4XB7A77058	BKSV	ThinkSystem 2.5" 7mm S4520 960GB Read Intensive SATA 6Gb Trayless SSD
4XB7A77059	BKSW	ThinkSystem 2.5" 7mm S4520 1.92TB Read Intensive SATA 6Gb Trayless SSD
4XB7A78627	BM1D	ThinkSystem 2.5" 7mm S4520 3.84TB Read Intensive SATA 6Gb Trayless SSD
4XB7A78628	BM1E	ThinkSystem 2.5" 7mm S4520 7.68TB Read Intensive SATA 6Gb Trayless SSD

## Features

The S4520 SSDs have the following features:

- 2.5-inch drives in multiple form factors
- Cost-effective Intel 3D NAND TLC Flash Memory
- Endurance of up to 3 drive writes per day (DWPD) for 5 years, using Intel Standard Endurance Technology (SET).
- SATA TLC solid-state drive with high read performance and consistently low latencies to fulfill client needs in the enterprise space
- High reliability and enhanced ruggedness
- Energy savings, with typical write power consumption as low as 2.3 W 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
- Full end-to-end data path protection
- Thermal throttling to extend the life of the drive
- Enhanced power loss data protection

SSDs have a huge but finite number of program/erase (P/E) cycles, which affect how long they can perform write operations and thus their life expectancy. Read Intensive (Entry) SSDs typically have a better cost per read IOPS ratio but lower endurance and performance compared to Write Intensive (Performance) SSDs. 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 total bytes written (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. However, 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 960 GB S4520 drive has an endurance of 5,300 TB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 2,904 GB of writes per day, which is equivalent to 3.0 full drive writes per day (DWPD). For the device to last three years, the drive write workload must be limited to no more than 4,840 GB of writes per day, which is equivalent to 5.0 full drive writes per day.

## Technical specifications

The following table presents technical specifications for the S4520 SSDs.

Table 2. Technical specifications

Feature	240 GB drive	480 GB drive	960 GB drive	1.92 TB drive	3.84 TB drive	7.68 TB drive
Interface	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA
Capacity	240 GB	480 GB	960 GB	1.92 TB	3.84 TB	7.68 TB
SED encryption	None	None	None	None	None	None
Endurance (drive writes per day)	2.5 DWPD	2.8 DWPD	3.0 DWPD	2.5 DWPD	2.1 DWPD	2.6 DWPD
Endurance (total bytes written)	1.0 PB	2.5 PB	5.3 PB	8.8 PB	15.3 PB	36.5 PB
Data reliability	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read
MTBF	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours
IOPS reads (4 KB blocks)	44,000	79,000	90,000	91,000	92,000	86,000
IOPS writes (4 KB blocks)	15,500	30,000	43,000	38,000	31,000	30,000
Sequential read rate (128 KB blocks)	470 MBps	550 MBps	550 MBps	550 MBps	550 MBps	550 MBps
Sequential write rate (128 KB blocks)	233 MBps	460 MBps	510 MBps	510 MBps	510 MBps	510 MBps
Read latency (sequential)	36 µs	36 µs	36 µs	37 µs	37 µs	37 µs
Write latency (sequential)	37 µs	36 µs	36 µs	38 µs	40 µs	37 µs
Read latency (random)	102 µs	102 µs	102 µs	104 µs	104 µs	103 µs
Write latency (random)	61 µs	48 µs	49 µs	54 µs	57 µs	57 µs
Shock, operating	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms
Shock, non-operating	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms	1,000 G (Max) at 0.5 ms
Vibration, operating	2.17 G <sub>RMS</sub> (5-700 Hz)	2.17 G <sub>RMS</sub> (5-700 Hz)	2.17 G <sub>RMS</sub> (5-700 Hz)	2.17 G <sub>RMS</sub> (5-700 Hz)	2.17 G <sub>RMS</sub> (5-700 Hz)	2.17 G <sub>RMS</sub> (5-700 Hz)
Vibration, non-operating	3.13 G <sub>RMS</sub> (5-800 Hz)	3.13 G <sub>RMS</sub> (5-800 Hz)	3.13 G <sub>RMS</sub> (5-800 Hz)	3.13 G <sub>RMS</sub> (5-800 Hz)	3.13 G <sub>RMS</sub> (5-800 Hz)	3.13 G <sub>RMS</sub> (5-800 Hz)
Typical power (Active Write Avg)	2.3 W	3.0 W	3.0 W	3.1 W	3.5 W	4.4 W

## Server support

The following tables list the ThinkSystem servers that are compatible.

Table 3. Server support (Part 1 of 3)

Part Number	Description	Edge					1S Intel V2			AMD V3				Intel V3						
		SE350 (7Z46 / 7D1X)	SE350 V2 (7DA9)	SE360 V2 (7DAM)	SE450 (7D8T)	SE455 V3 (7DBY)	ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	SR675 V3 (7D9Q / 7D9R)	ST650 V3 (7D7B / 7D7A)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SR950 V3 (7DC5 / 7DC4)
<b>2.5-inch hot-swap 6 Gb SATA SSDs</b>																				
4XB7A17072	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4XB7A17101	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
4XB7A17102	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
4XB7A17103	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
4XB7A17104	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
4XB7A17105	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
<b>7mm 2.5-inch hot-swap 6 Gb SATA SSDs</b>																				
4XB7A17106	ThinkSystem 7mm S4520 240GB Read Intensive SATA 6Gb HS SSD	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N
4XB7A17107	ThinkSystem 7mm S4520 480GB Read Intensive SATA 6Gb HS SSD	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N
4XB7A17108	ThinkSystem 7mm S4520 960GB Read Intensive SATA 6Gb HS SSD	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N
4XB7A78622	ThinkSystem 7mm S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78624	ThinkSystem 7mm S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch hot-swap 6 Gb SATA SSDs</b>																				
4XB7A17118	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N
4XB7A17119	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N
4XB7A17120	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N
4XB7A17121	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y	Y	Y	N	N	N
4XB7A17122	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y	Y	Y	N	N	N
4XB7A17123	ThinkSystem 3.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y	Y	Y	N	N	N

Part Number	Description	Edge					1S Intel V2			AMD V3				Intel V3					
		SE350 (7Z46 / 7D1X)	SE350 V2 (7DA9)	SE360 V2 (7DAM)	SE450 (7D8T)	SE455 V3 (7DBY)	ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	SR675 V3 (7D9Q / 7D9R)	ST650 V3 (7D7B / 7D7A)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)
<b>3.5-inch simple-swap 6 Gb SATA SSDs</b>																			
4XB7A17109	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
4XB7A17110	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
4XB7A17111	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
<b>2.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																			
4XB7A77459	ThinkSystem ST50 V2 2.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77460	ThinkSystem ST50 V2 2.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77461	ThinkSystem ST50 V2 2.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																			
4XB7A77454	ThinkSystem ST50 V2 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77455	ThinkSystem ST50 V2 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77456	ThinkSystem ST50 V2 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 server</b>																			
4XB7A76940	ThinkSystem ST50 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76941	ThinkSystem ST50 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76942	ThinkSystem ST50 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Trayless drives for ThinkSystem SD650 V2 and SD650-N V2 servers</b>																			
4XB7A77056	ThinkSystem Intel S4520 2.5" 7mm 240GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77057	ThinkSystem Intel S4520 2.5" 7mm 480GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77058	ThinkSystem 2.5" 7mm S4520 960GB Read Intensive SATA 6Gb Trayless SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77059	ThinkSystem 2.5" 7mm S4520 1.92TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78627	ThinkSystem 2.5" 7mm S4520 3.84TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78628	ThinkSystem 2.5" 7mm S4520 7.68TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 4. Server support (Part 2 of 3)

Part Number	Description	Dense V3				2S Intel V2				AMD V1				Dense V2				4S V2	8S		
		SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	SR650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR670 V2 (7Z22 / 7Z23)	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)	SR950 (7X11 / 7X12)
<b>2.5-inch hot-swap 6 Gb SATA SSDs</b>																					
4XB7A17072	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
4XB7A17101	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
4XB7A17102	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
4XB7A17103	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
4XB7A17104	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
4XB7A17105	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	
<b>7mm 2.5-inch hot-swap 6 Gb SATA SSDs</b>																					
4XB7A17106	ThinkSystem 7mm S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	Y	Y	N	N	N	N	Y	Y	Y	N	N	N	Y	Y	N
4XB7A17107	ThinkSystem 7mm S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	Y	Y	N	N	N	N	Y	Y	Y	N	N	N	Y	Y	N
4XB7A17108	ThinkSystem 7mm S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	Y	Y	N	N	N	N	Y	Y	Y	N	N	N	Y	Y	N
4XB7A78622	ThinkSystem 7mm S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
4XB7A78624	ThinkSystem 7mm S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
<b>3.5-inch hot-swap 6 Gb SATA SSDs</b>																					
4XB7A17118	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
4XB7A17119	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
4XB7A17120	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
4XB7A17121	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
4XB7A17122	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
4XB7A17123	ThinkSystem 3.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
<b>3.5-inch simple-swap 6 Gb SATA SSDs</b>																					
4XB7A17109	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Part Number	Description	Dense V3				2S Intel V2				AMD V1				Dense V2				4S V2	8S		
		SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR670 V2 (7Z22 / 7Z23)	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)	SR950 (7X11 / 7X12)
4XB7A17110	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A17111	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>2.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																					
4XB7A77459	ThinkSystem ST50 V2 2.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77460	ThinkSystem ST50 V2 2.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77461	ThinkSystem ST50 V2 2.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																					
4XB7A77454	ThinkSystem ST50 V2 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77455	ThinkSystem ST50 V2 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77456	ThinkSystem ST50 V2 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 server</b>																					
4XB7A76940	ThinkSystem ST50 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76941	ThinkSystem ST50 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76942	ThinkSystem ST50 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Trayless drives for ThinkSystem SD650 V2 and SD650-N V2 servers</b>																					
4XB7A77056	ThinkSystem Intel S4520 2.5" 7mm 240GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
4XB7A77057	ThinkSystem Intel S4520 2.5" 7mm 480GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
4XB7A77058	ThinkSystem 2.5" 7mm S4520 960GB Read Intensive SATA 6Gb Trayless SSD	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
4XB7A77059	ThinkSystem 2.5" 7mm S4520 1.92TB Read Intensive SATA 6Gb Trayless SSD	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N



Part Number	Description	Dense V3				2S Intel V2				AMD V1				Dense V2			4S V2	8S			
		SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR670 V2 (7Z22 / 7Z23)	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)	SR950 (7X11 / 7X12)
4XB7A78627	ThinkSystem 2.5" 7mm S4520 3.84TB Read Intensive SATA 6Gb Trayless SSD	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N
4XB7A78628	ThinkSystem 2.5" 7mm S4520 7.68TB Read Intensive SATA 6Gb Trayless SSD	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N

Table 5. Server support (Part 3 of 3)

Part Number	Description	4S V1		1S Intel V1		2S Intel V1								Dense V1						
		SR850 (7X18 / 7X19)	SR850P (7D2F / 2D2G)	SR860 (7X69 / 7X70)	ST150 (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)
<b>2.5-inch hot-swap 6 Gb SATA SSDs</b>																				
4XB7A17072	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
4XB7A17101	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
4XB7A17102	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
4XB7A17103	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
4XB7A17104	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
4XB7A17105	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
<b>7mm 2.5-inch hot-swap 6 Gb SATA SSDs</b>																				
4XB7A17106	ThinkSystem 7mm S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A17107	ThinkSystem 7mm S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A17108	ThinkSystem 7mm S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78622	ThinkSystem 7mm S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78624	ThinkSystem 7mm S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch hot-swap 6 Gb SATA SSDs</b>																				

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)
4XB7A17118	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A17119	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A17120	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A17121	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A17122	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A17123	ThinkSystem 3.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N
<b>3.5-inch simple-swap 6 Gb SATA SSDs</b>																			
4XB7A17109	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N
4XB7A17110	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N
4XB7A17111	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N
<b>2.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																			
4XB7A77459	ThinkSystem ST50 V2 2.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77460	ThinkSystem ST50 V2 2.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77461	ThinkSystem ST50 V2 2.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 V2 server</b>																			
4XB7A77454	ThinkSystem ST50 V2 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77455	ThinkSystem ST50 V2 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77456	ThinkSystem ST50 V2 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>3.5-inch non-hot-swap drives for ThinkSystem ST50 server</b>																			
4XB7A76940	ThinkSystem ST50 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76941	ThinkSystem ST50 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A76942	ThinkSystem ST50 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Trayless drives for ThinkSystem SD650 V2 and SD650-N V2 servers</b>																			

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)
4XB7A77056	ThinkSystem Intel S4520 2.5" 7mm 240GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77057	ThinkSystem Intel S4520 2.5" 7mm 480GB Entry SATA 6Gb Non-Hot Swap SSD Trayless	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77058	ThinkSystem 2.5" 7mm S4520 960GB Read Intensive SATA 6Gb Trayless SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A77059	ThinkSystem 2.5" 7mm S4520 1.92TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78627	ThinkSystem 2.5" 7mm S4520 3.84TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A78628	ThinkSystem 2.5" 7mm S4520 7.68TB Read Intensive SATA 6Gb Trayless SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

## Operating system support

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

The S4520 SSDs carry a one-year, customer-replaceable unit (CRU) limited warranty. When the SSDs are installed in a supported server, these drives assume the servers'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

The S4520 SSDs have the following physical specifications (approximate, without the tray):

- Height: 7 mm (0.3 in.)
- Width: 70 mm (2.8 in.)
- Depth: 100 mm (4.0 in.)
- Weight: less than 70 g (2.5 oz lb)

Shipping dimensions and weight - 2.5-inch drives (approximate, including the tray):

- Height: 63 mm (2.5 in.)
- Width: 174 mm (6.9 in.)
- Depth: 133 mm (5.2 in.)
- Weight: 434 g (1.0 lb)

Shipping dimensions and weight - 3.5-inch drives (approximate, including the tray):

- Height: 95 mm (3.7 in.)
- Width: 257 mm (10.1 in.)
- Depth: 193 mm (7.6 in.)
- Weight: 484 g (1.1 lb)

## Operating environment

The S4520 SSDs are supported in the following environment:

- Temperature: 0 - 70°C (32 - 158°F)
- Relative humidity: 5 - 95% (noncondensing)
- Maximum altitude: 3,050 m (10,000 ft)

## Agency approvals

The S4520 SSDs conform to the following regulations:

- FCC Title 47, Part 15B, Class B
- EN-55035:2017
- EN-55022:2006
- EN-55032:2012
- Low Voltage Directive (LVD) 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU
- WEEE Directive 2012/19/EU
- UL 60950-1, 2nd Edition, 2014-10-14
- CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-010
- UL/CSA 62368-1, 2nd Edition
- AS/NZ CISPR 32:2015
- AS/NZ CISPR 22:2009 +A1:2010
- Taiwan BSMI EMC standard CNS 13438
- Korea KCC Article 11.1
- Morocco Decree # 2574-14 (EMC)
- Canada ICES-003
- Japan VCCI
- China EFUP

## Related publications and links

For more information, see the following documents:

- Lenovo ThinkSystem storage options product web page  
<https://lenovopress.com/lp0761-storage-options-for-thinksystem-servers>
- Intel SSD Data Center S4520 Series product page  
<https://www.intel.com/content/www/us/en/products/docs/memory-storage/solid-state-drives/data-center-ssds/storage-infrastructure-optimized-brief.html>
- ServerProven for SSDs  
<http://www.lenovo.com/us/en/serverproven>
- Lenovo Press product guides for RAID controllers  
<https://lenovopress.com/servers/options/raid>
- Lenovo RAID Introduction  
<https://lenovopress.com/lp0578-lenovo-raid-introduction>
- Lenovo RAID Management Tools and Resources  
<https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources>

## Related product families

Product families related to this document are the following:

- [Drives](#)

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