Lenovo PM883 Entry 6Gb SATA SSDs
Product Guide

The Lenovo PM883 Entry SATA solid-state drives (SSDs) in capacities ranging from 240 GB to 7.86 TB are general-purpose SSDs based on the Samsung PM883 platform. They are engineered for greater performance and endurance in a cost-effective design, and to support a broader set of workloads.

Figure 1. Lenovo ThinkSystem 2.5" PM883 Entry SATA 6Gb Hot Swap SSD

Did you know?

Lenovo Entry SSDs are suitable for read-intensive and general-purpose data center workloads. Overall, these SSDs provide outstanding IOPS/watt and cost/IOPS for enterprise solutions and are an excellent choice for applications such as web serving, hyperscale cloud, content delivery, caching, databases, and analytics.

Part number information

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

Table 1. Ordering part numbers and feature codes - ThinkSystem

Part number	Feature code	Description
2.5-inch hot-swap drives for ThinkSystem		
4XB7A10195	B34H	ThinkSystem 2.5" PM883 240GB Entry SATA 6Gb Hot Swap SSD
4XB7A10196	B34J	ThinkSystem 2.5" PM883 480GB Entry SATA 6Gb Hot Swap SSD
4XB7A10197	B34K	ThinkSystem 2.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD
4XB7A10198	B34L	ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD
4XB7A10199	B34M	ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD
4XB7A10200	B4D2	ThinkSystem 2.5" PM883 7.68TB Entry SATA 6Gb Hot Swap SSD
3.5-inch hot-swap drives for ThinkSystem		
4XB7A17180	B6JZ	ThinkSystem 3.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD

The part numbers include the following items:

- One 2.5-inch solid-state drive in a ThinkSystem hot-swap tray
- 3.5-inch drive options include a 2.5-inch-to-3.5-inch conversion tray
- Documentation flyer

Features

The Entry SATA SSDs have the following features:

- Low cost, read-intensive SSD from Samsung
- 2.5-inch or 3.5-inch industry standard form factor with hot-swap tray
- 6 Gbps SATA interface
- Advanced ECC Engine and End-to-End Data Protection
- Samsung 32 layer V-NAND stacks the vertical NAND layers in three dimensions, solving the cell-to-cell interference that causes data corruption in planar NAND.
- Protect data integrity from unexpected power loss with Samsung's advanced power-loss protection architecture
- Supports Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T).
- Dynamic Thermal Guard Protection protects the SSD from overheating by automatically controlling the speed of the CPU relative to its core temperature

Entry SSDs and Performance SSDs have similar read and write IOPS performance, but the key difference between them is their endurance (or lifetime) (that is, how long they can perform write operations because SSDs have a finite number of program/erase (P/E) cycles). Entry SSDs have a better cost/IOPS ratio but lower endurance compared to Performance SSDs. SSD write endurance is typically measured by the number of program/erase (P/E) cycles that the drive incurs over its lifetime, listed as the total bytes of written data (TBW) in the device specification.

The TBW value assigned to a solid-state device is the total bytes of written data (based on the number of P/E cycles) that a drive can be guaranteed to complete (% of remaining P/E cycles = % of remaining TBW). Reaching this limit does not cause the drive to immediately fail. It simply denotes the maximum number of writes that can be guaranteed. A solid-state device will not fail upon reaching the specified TBW. At some point based on manufacturing variance margin, after surpassing the TBW value, the drive will reach the end-of-life point, at which the drive will go into a read-only mode.

Because of such behavior by Entry solid-state drives, careful planning must be done to use them only in read-intensive or mixed up to 70% read/30% write environments to ensure that the TBW of the drive will not be exceeded before the required life expectancy.

For example, the 480 GB PM883 Entry drive has an endurance of 683 TB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 374 GB of writes per day, which is equivalent to 0.8 full drive writes per day (DWPD). For the device to last three years, the drive write workload must be limited to no more than 624 GB of writes per day, which is equivalent to 1.3 full drive writes per day.

Technical specifications

The following tables present technical specifications for the PM883 Entry 6Gb SATA 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
Endurance (total bytes written)	341 TB	683 TB	1366 TB	2733 TB	5466 TB	10932 TB
Endurance (drive writes per day for 5 years)	0.8 DWPD	0.8 DWPD	0.8 DWPD	0.8 DWPD	0.8 DWPD	0.8 DWPD
Data reliability (UBER)	< 1 in 10^{17} bits read	< 1 in 10^{17} bits read	< 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	2,000,000 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)	98,000	98,000	98,000	98,000	98,000	98,000
IOPS writes (4 KB blocks)	14,000	24,000	25,000	25,000	28,000	27,000
Sequential read rate (128 KB blocks)	550 MBps	550 MBps	550 MBps	550 MBps	550 MBps	550 MBps
Sequential write rate (128 KB blocks)	320 MBps	520 MBps	520 MBps	520 MBps	520 MBps	520 MBps
Read latency (ran)	120 µs	120 µs	120 µs	140 µs	140 µs	140 µs
Write latency (ran)	70 µs	40 µs	40 µs	40 µs	40 µs	40 µs
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	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms
Vibration	2.17 G_{RMS} (7-800 Hz)	2.17 G_{RMS} (7-800 Hz)	2.17 G_{RMS} (7-800 Hz)	2.17 G_{RMS} (7-800 Hz)	2.17 G_{RMS} (7-800 Hz)	2.17 G_{RMS} (7-800 Hz)
Typical power (R/W)	2.3 W / 2.6 W	2.3 W / 2.9 W	2.3 W / 3.1 W	2.3 W / 3.4 W	2.3 W / 3.6 W	2.3 W / 3.6 W

Server support - ThinkSystem

The following table lists the ThinkSystem servers that are compatible.

Table 3. ThinkSystem server support

Part number	Description	1S Rack & Tower				2S Rack & Tower								4S Rack			Dense/ Blade			
		ST50 (7Y48/7Y50)	ST250 (7Y45/7Y46)	SR150 (7Y54)	SR250 (7Y51/7Y52)	ST550 (7X09/7X10)	SR530 (7X07/7X08)	SR550 (7X03/7X04)	SR570 (7Y02/7Y03)	SR590 (7X98/7X99)	SR630 (7X01/7X02)	SR650 (7X05/7X06)	SR670 (7Y36/7Y37/7Y38)	SR850 (7X18/7X19)	SR860 (7X69/7X70)	SR950 (7X11/12/13)	SD530 (7X21)	SD650 (7X58)	SN550 (7X16)	SN850 (7X15)
4XB7A10195	ThinkSystem 2.5" PM883 240GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A10196	ThinkSystem 2.5" PM883 480GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A10197	ThinkSystem 2.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A10198	ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A10199	ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A10200	ThinkSystem 2.5" PM883 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y
4XB7A17180	ThinkSystem 3.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	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 propduct guide for more information:

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

Warranty

The PM883 Entry 6Gb SATA 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

The PM883 Entry 6Gb SATA SSDs have the following physical specifications:

Dimensions and weight (approximate, without the hot-swap tray):

- Height: 7 mm (0.3 in.)
- Width: 70 mm (2.8 in.)
- Depth: 100 mm (4.0 in.)
- Weight: 58 g (2.1 oz)

Shipping dimensions and weight for the 2.5-inch drives (approximate):

- Height: 63 mm (2.5 in.)
- Width: 133 mm (5.2 in.)
- Depth: 174 mm (6.9 in.)
- Weight (hot-swap): 433 g (1.0 lb)

Operating environment

The PM883 Entry 6Gb SATA SSDs are supported in the following environment:

- Temperature: 0 - 70 °C (32 - 158 °F)
- Relative humidity: 8 - 85% (noncondensing)
- Maximum altitude: 3,050 m (10,000 ft)

Agency approvals

The PM883 Entry 6Gb SATA SSDs conform to the following regulations:

- UL
- TUV
- FCC
- CE Mark
- C-Tick Mark
- BSMI (Taiwan)
- KCC (Korea EMI)

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
- Lenovo System x storage options product web page
  https://www3.lenovo.com/us/en/data-center/servers/server-options/system-x-options/server-storage/c/system-x-storage
- 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
- Lenovo Press ServeRAID Adapter Quick Reference
  http://lenovopress.com/tips0054
- ThinkServer Option Compatibility Matrix (OCM)
  http://www.lenovo.com/accessoriesguide

Related product families

Product families related to this document are the following:

- Drives

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, LP0878, was created or updated on April 16, 2019.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  http://lenovopress.com/LP0878
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at http://lenovopress.com/LP0878.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
ServeRAID
System x®
ThinkServer®
ThinkSystem

Other company, product, or service names may be trademarks or service marks of others.