

Samsung PM1643 SAS SSD

Industry's Largest Capacity Enterprise
SSD from the SSD Technology Leader

Product Brief



Highlights

World's largest storage density fitting 30.72 TB in a 2.5-inch form factor drive.

6x faster performance than 15K RPM HDDs, with up to 2,100/2,000 sequential read/write and up to 400,000/50,000 IOPS random read/write speeds.

4x more power efficiency than 15K RPM HDDs, at about 148 MB/s per watt for reduced TCO.

Long-lasting reliability with enhanced software and an error correction code algorithm allowing up to 30.72 TB written per day over a five-year warranty period.

Samsung PM1643 SAS SSD offers up to 6 times the performance of 15K RPM HDD

Enterprise server and storage administrators face challenging requirements to deliver mission-critical business infrastructure on a limited budget. It is also imperative these environments remain stable when processing multiple heavy workloads. Considering each of these factors, IT and data center managers are tasked with finding high performing and dependable storage solutions.

Samsung provides SSDs with exceptional performance and reliability in primary enterprise storage applications such as virtual desktop infrastructures, web servers, email servers, enterprise resource planning, and relational databases.

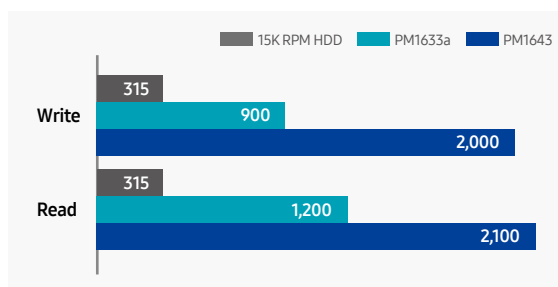
Compared to performance HDDs, the Samsung PM1643 achieves sequential workloads up to 6 times faster, thereby reducing the total cost of ownership (TCO). As the pioneer in vertical-NAND (V-NAND) technology, Samsung has the added advantage of being a vertically integrated supplier of all its SSD components, assuring end-to-end integration and superb quality.

Optimized for enterprise environments

To deliver enterprise reliability and performance, Samsung PM1643 uses a native SAS 3.0 controller, supporting dual-port high availability needs.

To meet the demand of high utilization, highly virtualized enterprise environments, the PM1643 uses firmware that prioritizes quality of service (QoS) for sustained random workloads, which keeps virtual machines running quickly and smoothly. When the majority of mission-critical workloads rely on small-sized random read (4 KB or less), the PM1643 shows excellent performance to deliver high IOPS. The firmware is also optimized for always on, always busy workloads, and is ready to respond quickly to incoming host requests. With no moving parts to fail, the PM1643 delivers enterprise class reliability for critical business data.

Sequential Performance (MB/s)



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BEST-IN-CLASS SAS DRIVE WITH THE INDUSTRY LARGEST CAPACITY

Built for High-Density Deployments

With over twice the capacity of today's highest capacity HDDs, the PM1643 enables enterprise system administrators to keep up with the growth of business data demands. The PM1643 delivers all the capacity—up to 30.72 TB—in a compact 2.5" form factor, rather than the bulky 3.5" form factor needed for high-capacity HDDs. The combination of a smaller form factor and higher capacity provides the critical capability to expand storage within existing infrastructure, rather than requiring costly new facilities.

Samsung PM1643 SAS SSD delivers:

- **World's Largest Storage Density:** By fitting more memory cells into a V-NAND chip, the PM1643 provides significantly more capacity—up to 30.72 terabytes (TB) in a 2.5" small form factor drive; Up to 737.28 TB can be stored in a 2U server.
- **Exceptional Value:** Using the latest Samsung 64-layer V-NAND flash memory, the powerful TLC flash memory employed in the PM1643 can address high-end enterprise applications, outperform planar MLC flash memory, and provide reliable solid state performance.
- **High Performance:** The PM1643 provides over 6 times the sequential read and write performance of the fastest 15K RPM HDDs¹, respectively. It also delivers wide bandwidth of up to 2,100 MB/s for sequential read speed. Random read and write speeds reach up to 400,000 IOPS and 50,000 IOPS, respectively.
- **Power Efficiency:** With no moving parts, the PM1643 achieves up to 2,000 MB/s sequential write speed at 13.5W power. This equals about 148 MB/s per watt, which is 4 times more power efficient than 15K RPM HDDs and a 60% improvement from Samsung's previous generation PM1633a SAS SSD.
- **Long-lasting Reliability:** Enhanced software provides metadata protection as well as data retention and recovery from sudden power failures; and an error correction code (ECC) algorithm ensures high reliability and minimal storage maintenance. Also, the PM1643 offers an endurance level of one full drive write per day over a five-year warranty period, translating to up to 30.72 TB of data written every day over five years without fail. The SSD also provides a mean time between failure (MTBF) of two million hours.

PM1643 SAS SSD Technical Specification

Capacity	30.72 TB / 15.36 TB / 7.68 TB / 3.84 TB / 1.92 TB / 960 GB
Form factor	2.5 inch
Interface	SAS12 Gbps
Sequential Read	Up to 2,100 MB/s
Sequential Write	Up to 2,000 MB/s
Random Read	Up to 400K IOPS
Random Write	Up to 70K IOPS
Reliability (MTBF) ⁴	2 Million Hours
Reliability (UBER) ⁵	1 sector per 10 ¹⁷ bits read
Endurance (DWPD) ⁶	1 drive write per day within 5 years
Allowable Voltage	5.0V ± 5%, 12V ± 5%
Average Power Consumption ⁷	Active Max. 13.5 W, Idle: 5 W
Dimension (WxHxD)	100.20 x 69.85 x 14.80 mm
Weight	Max 160.0g
Operating Temperature ⁸	0 - 70°C

1. Based on the advertised specifications of HDD manufacturers as of April 2018.
2. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, 1 TB = 1,000,000,000,000 Bytes, unformatted capacity. User accessible capacity may vary depending on operating environment and formatting.
3. Performance measured using IOMeter2006 with queue depth 128. Actual performance may vary depending on use conditions and environment.
4. MTBF is Mean Time Between Failure, and is the predicted elapsed time between inherent failures of a system during operation.
5. Uncorrectable Bit Error Rate (UBER) is a metric for the rate of occurrence of data errors, equal to the number of data errors per bits read as specified in the JESD218 document of JEDEC standard.
6. The endurance of SSD in enterprise application is defined as the maximum number of drive writes per day that can meet the requirements specified in the JESD218 document of JEDEC standard.
7. Active power is measured using IOMeter2006, Idle power is measured using drive meter 2010.
8. Based on the case temperature which is measured at the hottest point over all case surface. It is highly recommended to provide sufficient airflow to keep SSD working properly within the operating temperature even on heavier workload.

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