

Groundbreaking SSDs that raise the bar on satisfying big data demands



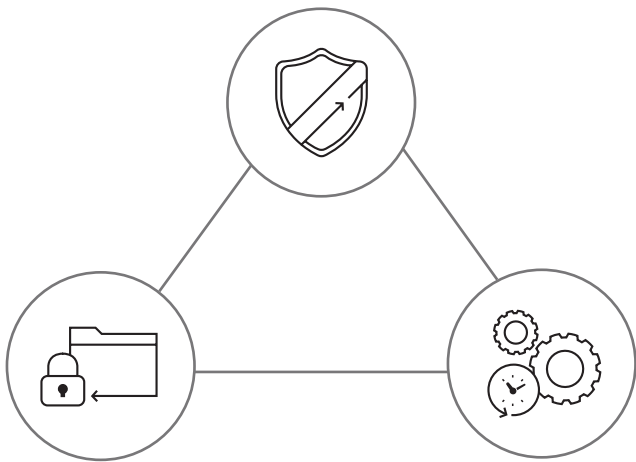


Innovations in solid state

As the importance of data in our lives increases, so too does the importance of data reliability and security. Samsung has been an industry leader in SSD technology for more than two decades, and our innovations are safeguarding data all over the world. Always on the cutting edge of technology, Samsung pioneered the world's first mass production of Vertical NAND flash memory. It's a groundbreaking technology that delivers more capacity, more speed, more endurance and more power efficiency. As technology evolves, so too will SSD technology, and you can trust that Samsung will always be at the forefront.

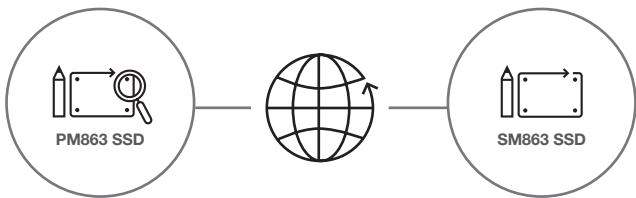
Satisfy big data demands with SSDs optimized for 24/7 data center use

The rapid increase in Internet traffic has placed huge demands on data centers, spurred on by businesses and consumers alike. As much of the huge daily volume of this data is unstructured, there is also an increasing need for big data analysis to help improve operational efficiency and provide better service. Samsung offers a leading-edge solution in the form of the Samsung 863 Series SSDs. The PM863 boasts high-performance random read/write (R/W) workloads, and is engineered for mixed workload data centers such as Content Delivery Networks (CDNs), streaming servers and web servers. The SM863 is able to process massive amounts of information with high efficiency, and is optimized for write-intensive applications such as Online Transaction Processing (OLTP), email servers and database servers.



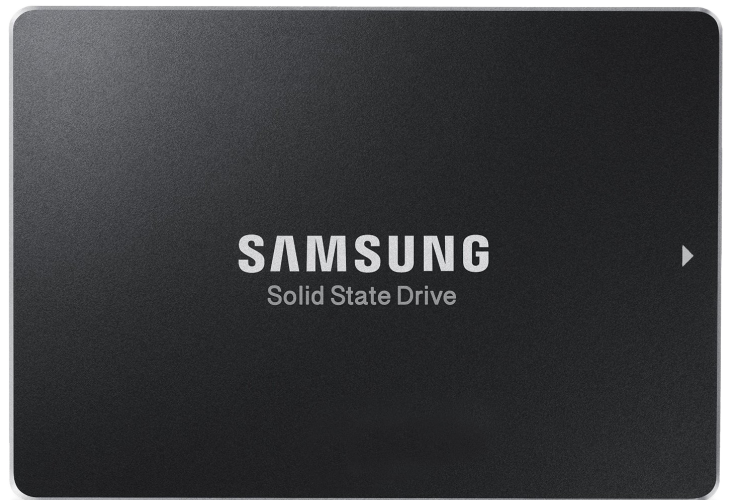
Our Leadership Translates to Reliability, Security and Efficiency

Samsung designs and integrates all components of its memory in-house, creating highly optimized components that offer the ultimate in reliability, security and efficiency.

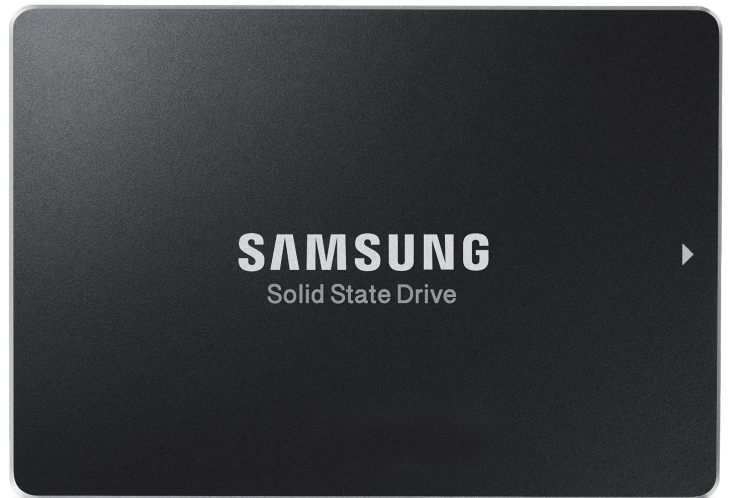


Two SSDs to Meet Your Needs

The Samsung PM863 SSD is ideal for mixed workloads, while the SM863 is ideal for write-intensive applications. Both feature cutting-edge Samsung technology and critically reliable performance.



PM863 SSD



SM863 SSD



An SSD to meet your specific workload requirements

The Samsung PM863 SSD and SM863 SSD outclass other products in terms of IOPS consistency, latency and quality of service (QoS).

Samsung PM863 SSD: Ideal for mixed workloads

The PM863 SSD delivers high random IOPS, lower latency, higher reliability and reduced Total Cost of Ownership (TCO) under mixed workloads. Ideal for CDNs, streaming and web servers, the PM863 maintains an IOPS consistency level of 90 percent or higher under virtually any write ratio conditions, based on internal tests.* Its constant and equal response time makes the PM863 an excellent choice for environments that must comply with a Service Level Agreement (SLA), such as cloud services.

*Internal tests were conducted with PM863 960GB.

90% IOPS consistency

SLA compliant

Low latency

Low TCO

Samsung SM863 SSD: Ideal for write-intensive workloads

With its high-level performance, endurance, security and power efficiency, the SM863 SSD is the ideal choice for OLTP, email servers and database servers. The SM863 delivers exceptional sequential R/W speeds of up to 520/485 MB/s and 4 KB random R/W IOPS of up to 97K/29K. Its extremely low latency and high level of QoS provide fast processing and analysis of massive amounts of information in demanding data center environments.

High-level performance

Exceptional speeds

Low latency

High level of QoS

Table 1. Sequential R/W and sustained random R/W performance of the PM863

	120 GB	240 GB	480 GB	960 GB	1,920 GB	3,840 GB
Sequential Read (128 KB, MB/s)	380	520	525	520	510	540
Sequential Write (128 KB, MB/s)	125	245	460	475	475	480
Random Read (4 KB, IOPS)	86K	99K	99K	99K	99K	99K
Random Write (4 KB, IOPS)	5K	10K	17K	18K	18K	18K

Table 2. IOPS consistency of the PM863^{1,2}

	120 GB	240 GB	480 GB	960 GB	1,920 GB	3,840 GB
Random Read (4 KB)	98%	98%	98%	98%	98%	99%
Random Write (4 KB)	94%	94%	94%	94%	90%	95%

Note:

1. IOPS consistency measured using Fio[®] with queue depth 32.
2. IOPS consistency (%) = (99.9% IOPS) / (Average IOPS) x 100.

Table 3. Sequential R/W and sustained random R/W performance of the SM863

	120 GB	240 GB	480 GB	960 GB	1,920 GB
Sequential Read (128 KB, MB/s)	500	520	520	520	520
Sequential Write (128 KB, MB/s)	460	485	485	485	485
Random Read (8 KB, IOPS)	57K	57K	57K	57K	57K
Random Write (8 KB, IOPS)	6K	10K	13K	14K	14K
Random Read (4 KB, IOPS)	97K	97K	97K	97K	97K
Random Write (4 KB, IOPS)	12K	20K	26K	28K	29K

Table 4. IOPS consistency of the SM863^{1,2}

	120 GB	240 GB	480 GB	960 GB	1,920 GB
Random Read (4 KB)	99%	99%	99%	99%	99%
Random Write (4 KB)	93%	97%	97%	97%	97%


Samsung delivers reliable, cost-efficient service for your data centers


Samsung is a global leader in SSD development. Our SSDs feature the advanced technologies, for advanced and cost-efficient performance.


Rely on a global leader in cutting-edge SSD technology


Samsung is a leading SSD provider. We design and integrate all the crucial components of the SSDs in house: the DRAM, NAND flash, controller and firmware. As the global leader in innovative V-NAND technology, and with intimate knowledge of every component of the SSD, Samsung can fine-tune each element at every stage of development to ensure perfect synergy and performance.

Safeguard priceless data with robust Samsung features

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V-NAND technology
Equipped with the innovative Samsung V-NAND architecture, the PM863 and SM863 help sustain data center performance 24/7, 365 days a year by providing higher endurance than planar NAND.
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Enhanced data integrity
Both the PM863 and SM863 prevent data corruption and secure data integrity. End-to-end protection ensures output data remains consistent with input data along the entire data transfer path, from the host interface to the NAND flash memory, without error. Using the Error Correcting Code (ECC) engine, it detects and remedies signal discrepancies in real time. Power-loss protection using built-in tantalum capacitors guards against data corruption and loss in the write cache in the event of power failures.
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Dynamic Thermal Guard
The Dynamic Thermal Guard algorithm monitors the temperature of the SSD and throttles back performance if necessary in order to prevent thermal shutdown.
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Self-encrypting drive*
The SM863 ensures data protection with the Samsung AES 256-bit, hardware-based Self-Encrypting Drive (SED). Data is secured with significantly less performance degradation, resulting in better performance, security and manageability.

*SM863 only

Lower TCO* without sacrificing performance

The PM863 and the SM863 boast better performance-to-power ratio than mechanical drives. This power efficiency reduces the operating costs of data centers.

The NAND flash-based PM863 and SM863 also provide high reliability, which can also reduce costs due to downtime. Reliability is guaranteed with 2 Million Mean Time Between Failure (MTBF) and the Total Bytes Written (TBW) found in Tables 5 and 6.

Both the PM863 and SM863 use the same 2.5-inch SATA interface, eliminating the need to change the existing infrastructure when converting to a Samsung SSD, further saving TCO. In addition, the PM863 is available in capacity options up to 3,840 GB, which can also save server space.

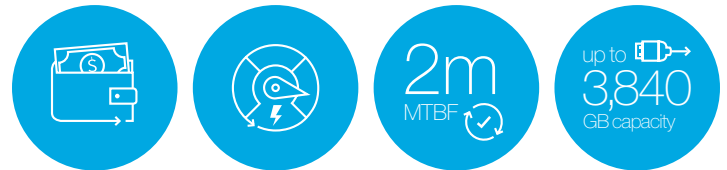


Table 5. TBW and MTBF of PM863

	120 GB	240 GB	480 GB	960 GB	1,920 GB	3,840 GB
TBW¹	170 TB	350 TB	700 TB	1,400 TB	2,800 TB	5,600 TB
MTBF²	2,000,000 Hours					

Table 6. TBW and MTBF of SM863

	120 GB	240 GB	480 GB	960 GB	1,920 GB
TBW¹	770 TB	1,540 TB	3,080 TB	6,160 TB	12,320 TB
MTBF²	2,000,000 Hours				

Note:
1. TBW is measured while running 100% random 4 KB writes across the entire SSD.
2. MTBF is Mean Time Between Failure.

*TCO results can vary depending upon application and conditions of the contract.

Specifications		PM863						SM863				
Product	MZ-7LM120Z	MZ-7LM240Z	MZ-7LM480Z	MZ-7LM960Z	MZ-7LM1T9Z	MZ-7LM3T8Z	MZ-7KM120Z	MZ-7KM240Z	MZ-7KM480Z	MZ-7KM960Z	MZ-7KM1T9Z	
Application	Data Center						Data Center					
Capacity ¹	120 GB	240 GB	480 GB	960 GB	1,920 GB	3,840 GB	120 GB	240 GB	480 GB	960 GB	1,920 GB	
Form Factor	2.5" Type						2.5" Type					
Interface	SATA 6 Gb/s Interface, compatible with SATA 3 Gb/s & SATA 1.5 Gb/s interface						SATA 6 Gb/s Interface, compatible with SATA 3 Gb/s & SATA 1.5 Gb/s interface					
Dimension (W x H x D)	Max. 100.2 x 69.85 x 6.8 (mm)						Max. 100.2 x 69.85 x 6.8 (mm)					
Weight	Max. 60 g						Max. 60 g					
NAND Type	Samsung 32 layer V-NAND						Samsung 32 layer V-NAND					
Controller	Samsung 7th Generation SATA 6 Gbps Controller for Data Center						Samsung 7th Generation SATA 6 Gbps Controller for Data Center					
Encryption Support	AES 256-bit											
Performance ²	Sequential Read (128 KB)	Up to 380 MB/sec	Up to 520 MB/sec	Up to 525 MB/sec	Up to 520 MB/sec	Up to 510 MB/sec	Up to 540 MB/sec	Up to 500 MB/sec	Up to 520 MB/sec	Up to 520 MB/sec	Up to 520 MB/sec	Up to 520 MB/sec
	Sequential Write (128 KB)	Up to 125 MB/sec	Up to 245 MB/sec	Up to 460 MB/sec	Up to 475 MB/sec	Up to 475 MB/sec	Up to 480 MB/sec	Up to 460 MB/sec	Up to 485 MB/sec	Up to 485 MB/sec	Up to 485 MB/sec	Up to 485 MB/sec
	Random Read (4 KB, QD32)	Up to 86,000 IOPS	Up to 99,000 IOPS	Up to 99,000 IOPS	Up to 99,000 IOPS	Up to 99,000 IOPS	Up to 99,000 IOPS	Up to 97,000 IOPS	Up to 97,000 IOPS	Up to 97,000 IOPS	Up to 97,000 IOPS	Up to 97,000 IOPS
	Random Write (4 KB, QD32)	Up to 5,000 IOPS	Up to 10,000 IOPS	Up to 17,000 IOPS	Up to 18,000 IOPS	Up to 18,000 IOPS	Up to 18,000 IOPS	Up to 12,000 IOPS	Up to 20,000 IOPS	Up to 26,000 IOPS	Up to 28,000 IOPS	Up to 29,000 IOPS
Average Power Consumption ³ (system level)	Active Read / Write: Up to 3.0 Watt / 4.1 Watt, Idle : 1.3 Watt						Active Read / Write: Up to 2.4 Watt / 3.1 Watt, Idle : 1.3 Watt					
Allowable Voltage	5.0 V ± 5%						5.0 V ± 5%					
Reliability (MTBF)	2,000,000 Hours						2,000,000 Hours					
Operating Temperature	0 - 70°C						0 - 70°C					
Shock	1,500 G & 0.5 ms						1,500 G & 0.5 ms					
TBW ⁴	170 TB	350 TB	700 TB	1,400 TB	2,800 TB	5,600 TB	770 TB	1,540 TB	3,080 TB	6,160 TB	12,320 TB	

1. 1 GB = 1 Billion bytes by IDEMA. Actual usable capacity may be less (due to formatting, partitioning, operating system, applications or otherwise).

2. Actual performance may vary depending on use conditions and environment.

1) Performance measured using IOMeter 2006 with queue depth 32, C216 Intel® SATA 6G port.

2) Measurements are performed on whole LBA range.

3) Write cache enabled.

4) 1 MB/sec = 1,048,576 bytes/sec was used in sequential performance.

3. Actual power consumption may vary depending on system hardware & configuration. Active write power is measured on 128 KB sequential write and active read power is measured on 4 KB random read.

4. TBW is measured while running 100% random 4 KB writes across the entire SSD.



Product support: 1-866-SAM4BIZ 1-800-SAMSUNG

For complete product information and accessories, visit samsung.com/ssd or samsung.com/samsungssd

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