

# Samsung PM863a/SM863a SSD for data centers

Keep ahead of ever-increasing data demands



# Stay on top of big data

## Overview

With the rise of personal, mobile, social and cloud computing, leading data centers are turning to SSDs to meet big data demands. Samsung's 3rd-generation V-NAND technology provides high capacities up to 3.84 TB in the same 2.5-inch form factor. Boasting exceptional performance, endurance and power efficiency, the new Samsung SATA 2.5-inch PM863a and SM863a SSDs deliver superb IOPS consistency, latency and QoS (quality of service). These high-performance SSDs provide the essentials for 24/7 data center environments.



### PM863a – Robust performance and lower TCO

The PM863a is designed for mixed workload data center applications, such as CDNs (content delivery networks), streaming and web servers.

With sequential R/W (read/write) speeds up to 520/480 MB/s and 4 KB random R/W speeds up to 97K/24K IOPS, it delivers robust performance<sup>1</sup> under various heavy workloads.

Generating a better performance-to-power ratio than HDDs, the PM863a reduces data center operating costs, resulting in lower TCO (total cost of ownership)<sup>2</sup>. Furthermore, by using the same 2.5-inch SATA interface, and with capacity options up to 3.84 TB, IT managers can scale up their data centers using existing infrastructure.

1. Performance of PM863a 3,840 GB  
 2. TCO results can vary depending upon the application and conditions of the contract.

### SM863a – Enhanced performance and endurance

With a higher level of endurance than the PM863a, the SM863a is the ideal choice for write-intensive applications, such as servers for OLTP (online transaction processing), emails and databases. The SM863a delivers sequential R/W speeds up to 510/485 MB/s and 4 KB random R/W IOPS up to 95K/28K.<sup>3</sup>

3. Performance of SM863a 1,920 GB



# Safeguard priceless data with robust features

## Enhanced data integrity

Both the PM863a and SM863a demonstrate a low probability of data corruption. End-to-end protection keeps data consistent along the entire data transfer path and Power Loss Protection safeguards data in the write cache in the event of a power failure. The Dynamic Thermal Guard algorithm monitors the temperature of the SSD to help prevent thermal shutdown.



End-to-End Data Protection



Power Loss Protection



Dynamic Thermal Guard



Data Security

## Self-encrypted drives

The PM863a and SM863a protect data with AES 256-bit hardware-based encryption. This encryption engine secures data without the performance degradation often experienced with software-based encryption.

## A technology leader in innovation

With innovation as its foundation, Samsung is one of the leading solution providers of world-class technology and scale. Samsung actually designs and integrates a wide array of critical SSD components in house, from the DRAM and NAND to the controller and firmware. Based on its intimate knowledge of every component, Samsung fine-tunes each element, enabling them to work in perfect synergy.



# Technical specifications

## Specifications

	PM863a	MZ7LM240HMHQ	MZ7LM480HMHQ	MZ7LM960HMJP	MZ7LM1T9HMJP	MZ7LM3T8HMLP
Capacity <sup>1</sup>		240 GB	480 GB	960 GB	1,920 GB	3,840 GB
Performance <sup>2</sup>	Seq. read (128 KB)	330 MB/s	520 MB/s	520 MB/s	520 MB/s	520 MB/s
	Seq. write (128 KB)	300 MB/s	480 MB/s	480 MB/s	480 MB/s	480 MB/s
	Rand. read (4KB, QD32)	86K IOPS	97K IOPS	97K IOPS	97K IOPS	97K IOPS
	Rand. write (4KB, QD32)	9K IOPS	16K IOPS	24K IOPS	24K IOPS	24K IOPS
Average power consumption <sup>3</sup> (3,840 GB)	Active Read (Typ.) 3 W, Active Write (Typ.) 4 W, Idle 1.3 W					
TBW (Terabytes written) <sup>4</sup>		341 TB	683 TB	1,366 TB	2,733 TB	5,466 TB
DWPD <sup>5</sup>	1.3 (3 Years)					

	SM863a	MZ7KM240HMHQ	MZ7KM480HMHQ	MZ7KM960HMJP	MZ7KM1T9HMJP
Capacity <sup>1</sup>		240 GB	480 GB	960 GB	1,920 GB
Performance <sup>2</sup>	Seq. read (128 KB)	410 MB/s	510 MB/s	510 MB/s	510 MB/s
	Seq. write (128 KB)	450 MB/s	485 MB/s	485 MB/s	485 MB/s
	Rand. read (4KB, QD32)	90K IOPS	95K IOPS	95K IOPS	95K IOPS
	Rand. write (4KB, QD32)	10K IOPS	19K IOPS	25K IOPS	28K IOPS
Average power consumption <sup>3</sup> (1,920 GB)	Active Read (Typ.) 2.5 W, Active Write (Typ.) 3 W, Idle 1.4 W				
TBW (Terabytes written) <sup>4</sup>		1,540 TB	3,080 TB	6,160 TB	12,320 TB
DWPD <sup>5</sup>	3.6 (5 Years)				

Common features	Form factor	2.5 inch 7mmT				
	Interface	SATA 6.0 Gbps				
	Dimension (WxDxH)	Max. 100.2 x 69.85 x 6.8 (mm)				
	Weight	Max. 55 g (PM863a) / Max. 60 g (SM863a)				
	NAND type	Samsung V-NAND				
	Encryption support	AES 256-bit Encryption Engine				
	Allowable voltage	5.0 V ± 5%				
	MTBF <sup>6</sup>	2,000,000 hours				
	UBER <sup>7</sup>	1 sector per 10 <sup>17</sup> bits read				
	Operating temperature	0 - 70°C				
Shock	1500 G, duration 0.5 ms, Half Sine Wave					

- 1 GB = 1 Billion bytes by IDEMA. Actual usable capacity may be less (due to formatting, partitioning, operating system, applications or otherwise).
- 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.
- 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.
- TBW is measured while running 100 % random 4 KB writes across the entire SSD. (TBW = DWPD x 365 x 3 x User capacity).
- Drive Write Per Day (DWPD)
- MTBF is Mean Time Between Failure. As same word, annual failure ratio is 0.438%.
- 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. For the enterprise application, JEDEC recommends that UBER shall be below 10<sup>-16</sup>.

## For more information

For more information about the Samsung PM863a/SM863a SSD, visit [www.samsung.com/semiconductor](http://www.samsung.com/semiconductor).



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