

# Samsung PM863a SSD

Keep ahead of ever-increasing data demands



## Overview

With the rise of mobile, social and cloud computing, 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 delivers superb IOPS consistency, latency and QoS (quality of service).

The PM863a provides the essentials for 24/7 data center environments. It's increasingly being adopted in all-flash array, JBOF (just bunch of flash) and HCIS (hyperconverged integrated systems) with qualified compatibility in the PM863.

## PM863a highlights

- Capacity: Up to 3.84 TB
- Performance: Sequential R/W up to 520/480 MB/s
- Power efficiency: Active R/W 3 W, Max. 4W, Idle 1.3 W
- Endurance: UBER<sup>1</sup>: 1 sector per 10<sup>17</sup> bits read

## Robust performance and low 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 speeds up to 520/480 MB/s and random R/W speeds up to 97K/24K IOPS, it delivers robust performance for heavy workloads. The PM863a maintains a strong IOPS consistency<sup>2</sup> above 99% in random read performance and superior performance in random write speeds.

Generating a better performance-to-power ratio than HDDs, the PM863a reduces data center operating costs, resulting in lower TCO.<sup>3</sup> Furthermore, by using the same 2.5-inch SATA interface, and with capacity up to 3.84 TB, IT managers can scale up their data centers using existing infrastructure.

## Safeguard priceless data with powerful features

### Enhanced data integrity

The PM863a has 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. Dynamic Thermal Guard monitors the SSD's temperature to help prevent thermal shutdown.

### Self-encrypted drives

The PM863a protects data with AES 256-bit hardware-based encryption without the performance degradation often experienced with software-based encryption.

## A technology leader in innovation

Samsung designs and integrates a wide array of critical SSD components in house, including the DRAM, NAND, controller and firmware. Based on their intimate knowledge of every component, Samsung fine-tunes each element, enabling them to work in perfect synergy.

1. UBER (Uncorrectable Bit Error Rate) 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 be below 10<sup>-16</sup>.
2. IOPS consistency is measured using FIO with queue depth 32. IOPS consistency (%) = (99.9% IOPS)/(Average IOPS) x 100.
3. TCO (total cost of ownership) results can vary depending upon the application and conditions of the contract.

# 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     |
| Reliability                            | MTBF <sup>3</sup>   | 2,000,000 hours                         |              |              |              |              |
|  | UBER <sup>4</sup>   | 1 sector per 10 <sup>17</sup> bits read |              |              |              |              |
| 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. 60 g   |   |              |              |              |              |
| NAND type                              | Samsung V-NAND  |   |              |              |              |              |
| Encryption support                     | AES 256-bit Encryption Engine                             |   |              |              |              |              |
| Allowable voltage                      | 5.0 V ± 5%  |   |              |              |              |              |
| Average power consumption <sup>5</sup> | Active read (Typ.) 3 W, Active write Max. 4 W, Idle 1.3 W |   |              |              |              |              |
| Operating temperature                  | 0 - 70°C  |   |              |              |              |              |
| Shock                                  | 1500 G, duration 0.5 ms, Half Sine Wave                   |   |              |              |              |              |

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. MTBF is Mean Time Between Failure. As same word, annual failure ratio is 0.438%.

4. 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>.

5. 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.

## For more information

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



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