

# Samsung V-NAND SSD 860 PRO

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2018 Data Sheet

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Revision 1.1



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# Revision History

| Revision Number | Description                          | Revision Date |
|-----------------|--------------------------------------|---------------|
| 001             | Initial Release                      | December 2017 |
| 002             | Fix MTBF rating to 1.5 million hours | March 2018    |

## THE SAMSUNG SSD 860 PRO

The Samsung SSD 860 PRO is the new Samsung's Client-PC SATA SSDs, specially designed for high-end computing devices. Building on the reputation of the Samsung SSD 850 PRO, the world's first V-NAND SSD for Client PCs, the new Samsung SSD 860 PRO drives achieve top class performance for SATA SSDs, offering improvements in speed, reliability, and compatibility. The 860 PRO comes equipped with Samsung's newly designed MJX controller along with the latest 2bit MLC V-NAND architecture.

### Professional Performance

The legacy Serial-ATA (SATA) interface faces the theoretical bandwidth limitation of 600MB/s which many SSD manufacturers have tried to reach over the years. Among them, Samsung, which first brought V-NAND technology to the market through the 850 PRO, continuously strives to improve product reliability and performance, even with the SATA interface limitations. Powered by Samsung's latest 64-layer 2bit MLC V-NAND technology, the 860 PRO, the successor of the 850 PRO, delivers best-in-class sequential read (up to 560 MB/s) and write (up to 530 MB/s) speeds and along with high sustainable performance for the professionals who always pursue best achievement

### Ultimate Reliability

The 860 PRO offers guaranteed endurance and ultimate reliability, with up to approximately 8 times higher Total Bytes Written (TBW) than the 850 PRO and an industry-leading 5-year limited warranty. Up to 4,800 TBW powered by the latest V-NAND technology, which is the highest TBW rating industry-wide, will give you absolute confidence in your SSD\*.

\*All documented endurance test results are obtained in compliance with JESD218 standards. Please visit [www.jedec.org](http://www.jedec.org) for detailed information on the standard.

Furthermore, the 860 PRO assures long-term dependable performance with minimal performance degradation. The 860 PRO provides up to 25% better sustained performance compare to that of its predecessor. This means you can experience the high performance of the SSD even with heavy daily workload.

### Smart Compatibility with a Refined Controller

The 860 PRO delivers expanded system compatibility. The refined ECC algorithm and revamped controller generate strong sustainable performance near SATA's limits, and the improved queued trim provides for better Linux compatibility. The 860 PRO is uniquely designed for not only Client-PCs but also NASs (Network Attached Storages) and workstations thanks to its Samsung 2bit MLC V-NAND composition.

### Advanced Data Encryption

The 860 PRO provides multiple advanced data encryption features. Self-Encrypting Drive (SED) security technology will help keep data safe at all times. The 860 PRO includes an AES 256-bit hardware-based encryption engine to ensure that your personal files remain secure. Being hardware-based, the encryption engine secures your data without the performance degradation that you may experience with software-based encryption. Also, the 860 PRO is compliant with various advanced security management solutions (TCG Opal and Encrypted Drive-IEEE1667).

### Samsung Data Migration and Magician Software

The 860 PRO comes with Samsung Data Migration and Magician software, which is easy to install and makes management of you SSD simple.\* Samsung Data Migration software is easy to use, yet provides a very powerful "Custom Cloning" feature that makes migration effortless even when the source data is greater than the SSD's capacity. Magician provides personalized firmware checks and additional functions tailored for individual users' drives. It even updates the firmware automatically to make sure that the drives' performance stays up to date.

\*To download Samsung Data Migration and Magician, please visit [www.samsung.com/samsungssd](http://www.samsung.com/samsungssd)

## TECHINICAL SPECIFICATIONS

## Samsung SSD 860 PRO

| Usage Application                  | Client PCs                                                                 |               |                                 |       |            |            |            |
|------------------------------------|----------------------------------------------------------------------------|---------------|---------------------------------|-------|------------|------------|------------|
| Interface                          | SATA 6 Gb/s Interface, compatible with SATA 3 Gb/s & 1.5 interfaces        |               |                                 |       |            |            |            |
| Hardware Information               | Capacity <sup>1)</sup>                                                     |               | 256GB                           | 512GB | 1TB        | 2TB        | 4TB        |
|                                    | Controller                                                                 |               | Samsung MJX Controller          |       |            |            |            |
|                                    | NAND Flash Memory                                                          |               | Samsung V-NAND 2bit MLC         |       |            |            |            |
|                                    | DRAM Cache Memory                                                          |               | 512MB LPDDR4                    |       | 1GB LPDDR4 | 2GB LPDDR4 | 4GB LPDDR4 |
|                                    | Dimension                                                                  |               | 100x 69.85x 6.8(mm)             |       |            |            |            |
|                                    | Form Factor                                                                |               | 2.5 inch                        |       |            |            |            |
| Performance (Up to.) <sup>2)</sup> | Sequential Read                                                            |               | 560 MB/s                        |       |            |            |            |
|                                    | Sequential Write <sup>3)</sup>                                             |               | 530 MB/s                        |       |            |            |            |
|                                    | 4KB Ran. Read (QD1)                                                        |               | 11,000 IOPS                     |       |            |            |            |
|                                    | 4KB Ran. Write (QD1)                                                       |               | 43,000 IOPS                     |       |            |            |            |
|                                    | 4KB Ran. Read (QD32)                                                       |               | 100,000 IOPS                    |       |            |            |            |
|                                    | 4KB Ran. Write (QD32)                                                      |               | 90,000 IOPS                     |       |            |            |            |
| Power Consumption <sup>4)</sup>    | Idle                                                                       | DIPM On       | 40 mW                           | 40 mW | 40 mW      | 40 mW      | 40 mW      |
|                                    | Active (Avg.)                                                              | Read/Write    | 2 W                             | 2 W   | 2.2 W      | 2.2 W      | 2.2 W      |
|                                    | Device Sleep                                                               |               | 2 mW                            | 2 mW  | 2.5 mW     | 4.5 mW     | 7 mW       |
| Reliability                        | Temp.                                                                      | Reliability   | 0°C to 70°C                     |       |            |            |            |
|                                    |                                                                            | Non-Operating | -45°C to 85°C                   |       |            |            |            |
|                                    | Humidity                                                                   |               | 5% to 95% non-condensing        |       |            |            |            |
|                                    | Shock                                                                      | Non-Operating | 1,500G, duration: 0.5ms, 3 axis |       |            |            |            |
|                                    | Vibration                                                                  | Non-Operating | 20~2,000Hz, 20G                 |       |            |            |            |
|                                    | MTBF                                                                       |               | 1.5 million hours               |       |            |            |            |
| Warranty <sup>8)</sup>             | TBW <sup>5) 6)</sup>                                                       |               | 300TB                           | 600TB | 1,200TB    | 2,400TB    | 4,800TB    |
|                                    | Period                                                                     |               | 5 years, Limited <sup>7)</sup>  |       |            |            |            |
| Supporting Features                | TRIM (Required OS support), Garbage Collection, S.M.A.R.T                  |               |                                 |       |            |            |            |
| Data Security                      | AES 256-bit Full Disk Encryption, TCG/Opal V2.0, Encrypted Drive(IEEE1667) |               |                                 |       |            |            |            |

1) GB: 1GB = 1,000,000,000 bytes. A certain portion of capacity may be used for system file and maintenance use, thus the actual available capacity may differ from the labeled total capacity.

2) Sequential performance measurements are based on CrystalDiskMark v. 5.0.2. Random performance measurements are based on IOMeter1.1.0. Performance may vary based on SSD's firmware version, system hardware & configuration. Test system configuration: Intel® Core i5-3550 CPU@3.3 GHz, DDR3 1333MHz 4GB, OS-Windows 7 Ultimate 64bit, Chipset-ASUS P8H77-V

3) Power consumption is measured with IOMeter1.1.0 version with Intel Core i7-7700K @ 4.2GHz, SAMSUNG DDR4 16GB, Gigabyte GA-Z270X, OS – Windows 10 PRO K x64

4) All documented endurance test results are obtained in compliance with JESD218 Standards. Please visit [www.jedec.org](http://www.jedec.org) for detailed information on JESD218 Standards

5) TBW means Total Bytes Written.

6) Please refer to the detailed warranty statement here at <http://samsung.com/samsungssd>.

7) Warranty provides coverage for the stated time period or the TBW, whichever comes first.

## PRODUCT LINEUP

| Density            | Model Name | Box Contents                                    | Model Name                                                     |
|--------------------|------------|-------------------------------------------------|----------------------------------------------------------------|
| 256GB*             | MZ-76P256  | Samsung SSD 860 PRO 256GB<br>Warranty Statement | MZ-76P256BW<br>MZ-76P256B/EU<br>MZ-76P256B/CN<br>MZ-76P256B/KR |
| 512GB*             | MZ-76P512  | Samsung SSD 860 PRO 512GB<br>Warranty Statement | MZ-76P512BW<br>MZ-76P512B/EU<br>MZ-76P512B/CN<br>MZ-76P512B/KR |
| 1TB<br>(1,024GB*)  | MZ-76P1T0  | Samsung SSD 860 PRO 1TB<br>Warranty Statement   | MZ-76P1T0BW<br>MZ-76P1T0B/EU<br>MZ-76P1T0B/CN<br>MZ-76P1T0B/KR |
| 2TB*<br>(2,048GB*) | MZ-76P2T0  | Samsung SSD 860 PRO 2TB<br>Warranty Statement   | MZ-76P2T0BW<br>MZ-76P2T0B/EU<br>MZ-76P2T0B/CN<br>MZ-76P2T0B/KR |
| 4TB<br>(4,096GB*)  | MZ-76P4T0  | Samsung SSD 860 PRO 4TB<br>Warranty Statement   | MZ-76P4T0BW<br>MZ-76P4T0B/EU<br>MZ-76P4T0B/CN<br>MZ-76P4T0B/KR |

\* GB: 1GB = 1,000,000,000 bytes by IDEMA. The actual usable capacity may be less than the labeled capacity. For more information, including but not limited to the warranty provided for this product, please visit [www.samsung.com/ssd](http://www.samsung.com/ssd) and [www.samsungssd.com](http://www.samsungssd.com).