Media Reviews

RECOMMENDED BY ANANDTECH

Samsung does not cease to amaze me with their SSDs as the 850 PRO just kills it in every aspect.
ANANDTECH

TweakTown

I was genuinely excited about the Samsung 850 PRO 1TB all the way through this article.
TweakTown

Samsung has been unstoppable, carving out a new standard with every SSD release. The release of the 850 PRO SSD with 3D V-NAND is a perfect example of just that.
TheSSDReview

THE TECH REPORT

Both of those performances suggest Samsung's new hotness is well-suited to demanding consumer workloads.
Tech Report

HOT HARDWARE

850 PRO series is a winner in terms of performance.
HOT hardware

VORTEZ GOLD

New Samsung 32 layer 3D V-NAND flash memory. It is certainly an volutionary step in the right direction.
VORTEZ

Product Lineup

Density	Model Name	Box Contents	Model Code
128GB	MZ-7KE128	Samsung SSD 850 PRO 128GB Warranty statement Installation guide Software CD	MZ-7KE128BW
256GB	MZ-7KE256	Samsung SSD 850 PRO 256GB Warranty statement Installation guide Software CD	MZ-7KE256BW
512GB	MZ-7KE512	Samsung SSD 850 PRO 512GB Warranty statement Installation guide Software CD	MZ-7KE512BW
1TB (1,024GB)	MZ-7KE1T0	Samsung SSD 850 PRO 1TB Warranty statement Installation guide Software CD	MZ-7KE1T0BW

Package-Set

Technical Specifications

	Samsung SSD 850 PRO	
Usage applications	Client PCs	
Capacity	128GB, 256GB, 512GB, 1TB (1,024GB)	
Dimensions (L x W x H)	100 x 69.85 x 6.8 (mm)	
Interface	SATA 6Gb/s (compatible with SATA 3Gb/s and SATA 1.5Gb/s)	
Form factor	2.5 inch	
Controller	Samsung 3-core MEX Controller	
NAND flash memory	Samsung 32-layer 3D V-NAND	
DRAM cache memory	256MB (128GB) or 512MB (256GB&512GB) or 1GB (1TB) LPDDR2	
Performance*	Sequential Read	Max. 550MB/s
	Sequential Write*	Max. 520MB/s (256GB/512GB/1TB)
		Max. 470MB/s (128GB)
	4KB Random Read (QD1)	Max. 10,000 IOPS
	4KB Random Write (QD1)	Max. 36,000 IOPS
	4KB Random Read (QD32)	Max. 100,000 IOPS
	4KB Random Write (QD32)	Max. 90,000 IOPS
TRIM support	Yes (Requires OS support)	
Garbage collection	Yes	
S.M.A.R.T.	Yes	
Security	AES 256-bit Full Disk Encryption (FDE)	
	TCG/Opal v2.0, Encrypted Drive (IEEE1667)	
Weight	Max. 66g (1TB)	
Reliability	MTBF : 2 million hours	
TBW	150 TBW (Terabytes Written)	
Power consumption*	Active Read (Average) : Max. 3.3W (1TB)	
	Active Write (Average) : Max. 3.0W (1TB)	
	Idle : Max. 0.4W	
	Device Sleep : 2mW	
Temperature	Operating : 0°C to 70°C	
	Non-Operating : -40°C to 85°C	
Humidity	5% to 95%, non-condensing	
Vibration	Non-operating : 20~2,000Hz, 20G	
Shock	Non-operating : 1500G , duration 0.5msec, 3axis	
Warranty	10-year limited	

* Sequential performance measurements based on CrystalDiskMark v.3.0.1.Random performance measurements based on IOmeter 2010. Performance may vary based on SSD's firmware version, system hardware and configuration.
   Test system configuration: Intel® Core i5-2500K @ 3.3GHz, DDR3 1600 MHz 4 GB, OS – Windows® 7 Ultimate x64 SP1 IRST 11.5.4.1001, MS performance guide pre-condition Intel® Z68
** Power consumption measured with IOmeter 1.1.0 version with Intel® i7-4770K, Samsung DDR3 8GB, Intel® DH87RL OS- Windows® 7 Ultimate x64 SP1

Samsung SSD activated

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SAMSUNG

The World's First 3D V-NAND SSD
One giant leap ahead

SAMSUNG Solid State Drive

Samsung SSD 850 PRO

Go where no SSD has gone before, with the new SSD 850 PRO. Its uniquely stacked 3D V-NAND technology results in unmatched performance and outstanding endurance-150 Terabytes Written. We even provide a 10-year limited warranty.
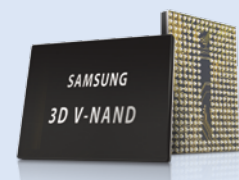
SAMSUNG

Designed by professionals for professionals with high-end computing needs

Boost performance with an industry-leading 3D V-NAND SSD

As a professional looking for the highest performing SSD available anywhere, look no further with the Samsung SSD 850 PRO. And if you're a hardcore gaming enthusiast, hold onto your seat, because you'll be amazed at the video performance you'll experience. Designed by, and created for professionals, the 850 PRO won't disappoint.
Plus, it's available in a wide range of capacities to suit virtually any need - including 1TB.

The 850 PRO boasts the world's first Vertical NAND (V-NAND) SSD available to the end consumer for use in high-end computing PCs. Whether you're a heavy workload professional or an avid gamer, you'll find that the 850 PRO delivers blazing - fast speeds - the fastest on the market - and the most endurance to ensure it won't let you down when you need it the most. Whatever task you throw at it, it will perform superbly - and do so with more energy efficiency than you ever thought imaginable.

What is V-NAND and how does it differ from existing technology?

Samsung's 3D V-NAND flash memory is fabricated using an innovative vertical design. Its vertical architecture stacks 32 cell layers on top of one another rather than trying to decrease the cells' length and width to fit today's ever-shrinking form factors. This architecture results in higher density and higher performance using a smaller footprint. Samsung's 3D V-NAND technology is a breakthrough in overcoming current density limits.

Gear up for super-charged performance

Powered by Samsung's cutting-edge 3D V-NAND technology, the NAND flash memory delivers the ultimate in read and write performance in both sequential and random aspects. This is especially impressive in the 128GB model* that outperforms similar models on the market by more than 80MB/s in write speed.

* 850 PRO 128GB Sequential Write speed : 470MB/s

PCMark 7	PCMark Vantage

(■ 840 PRO / ■ 850 PRO / ■ A)
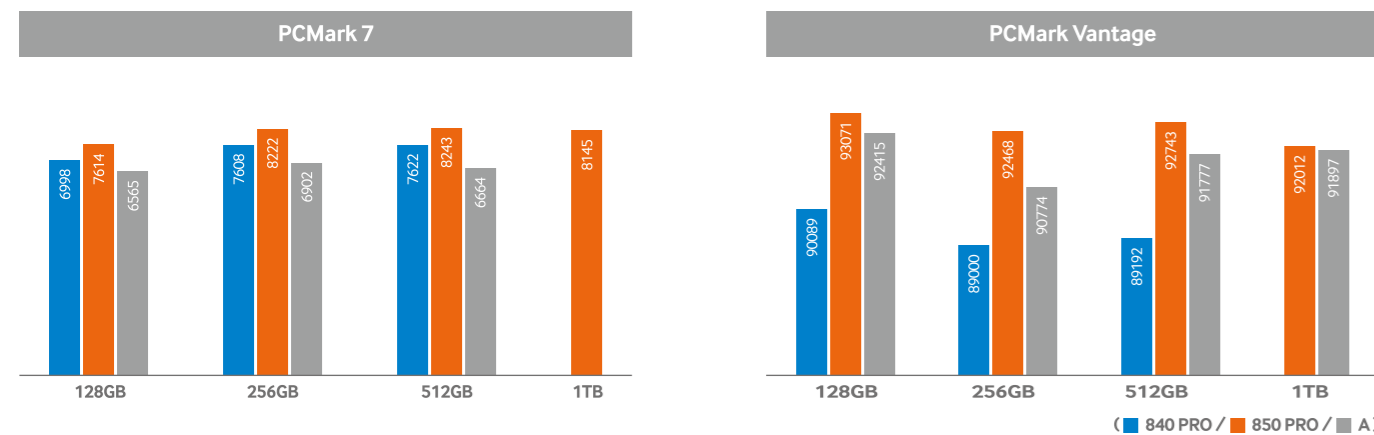
You can kick up the performance when you need it with the RAPID mode. Just like shifting gears in a car, Magician software gives you the option to gain 1.8 times faster performance in the RAPID mode* by processing data on a system level using free PC memory (DRAM) as a cache. Magician increases the maximum memory in RAPID mode from 1GB, in the previous version, to up to 4GB when implementing 16GB of DRAM for an enhanced user experience.

Enhanced RAPID mode

Depending on your PC's memory, you can expect higher performance and more efficient command processing, which improves with repetitive tasks. You can shift into high gear to vastly improve queue depth (QD)1 random write performance to almost the same level as QD32 - achieving blazing-fast speeds.

* PCMark Vantage score (512GB) : 53K > 97K (in RAPID mode)

Unmatched performance, endurance and energy efficiency

Low Power **Device Sleep**

Rely on an SSD that won't quit before you do

10 year WARRANTY

The 850 PRO won't disappoint you when it comes to endurance, with twice that of the previous model, the 840 PRO. Samsung's V-NAND technology is built to handle 150 Terabytes Written (TBW), which equates to a 40GB daily read/write workload over a ten-year period. Plus, it comes with the industry's top-level, ten-year limited warranty.

	850 PRO	840 PRO
Total Bytes Written (TBW)	150	73
Daily workload (GB/day)	40	40
Warranty (year)	10	5

Work longer with high-efficiency innovation

Efficient Power Management

Samsung prides itself on its innovations in efficient power management technologies that help you work longer and more productively. The 850 PRO is no exception, boasting the lowest idle power consumption of any SSD, which is extremely important considering that SSDs spend most of their time in idle mode.

In fact, the 850 PRO fully supports the sleep mode on the Ultrabook™, consuming only 2 m watts of power. Plus, its LPDDR2 cache memory offers higher performance while consuming 30 percent less power when active and 93 percent less power when idle than typical DDR2 or DDR3 memory.

The efficient power management of the 850 PRO saves up to 40 percent more power than the 840 PRO because the 3D V-NAND consumes half that of a 2D planar NAND and is among the lowest in active write power consumption.

		(Watt)
Idle	840PRO	0.4
	850PRO	0.4
	A	1.3

		(Watt)
Active	840PRO	5.7
	850PRO	3.5
	A	5.8

		(mW)
DEVSLP	840PRO	Not support DEVSLP
	850PRO	2
	A	Not support DEVSLP
	B	5
	C	3
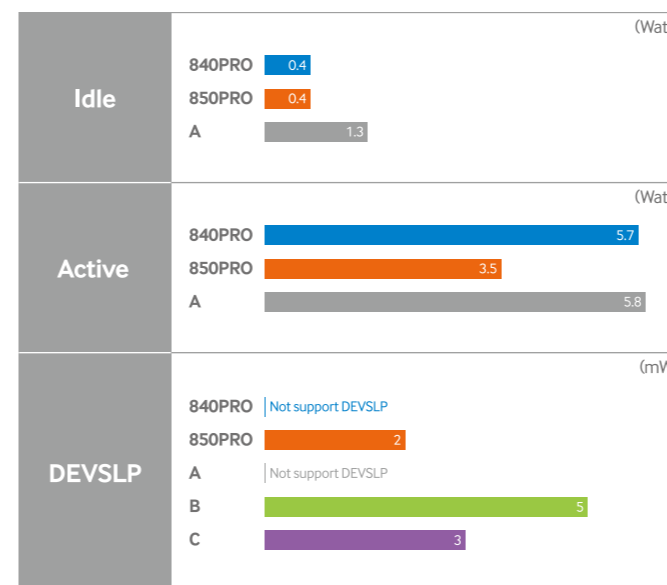
* 512GB based

Bringing you the future of high-end computing and gaming now

Safeguard precious data without sacrificing performance

Data Security

When you take your laptop on the road, you not only need to protect your PCs hardware, but your personal data, too. But don't worry.
The 850 PRO's Self-Encrypting Drive (SED) technology will help keep it safe, even if you lose your laptop. The drive includes an AES-256-bit hardware-based, full disk encryption engine that secures your data without performance degradation, which is often experienced with software-based encryption. The 850 PRO's advanced security complies with the Trusted Computing Group (TCG) Opal v2.0 standards, Physical Security ID (PSID), and is compatible with the Microsoft® eDrive Institute of Electrical and Electronics Engineers® (IEEE) 1667 protocol. You can choose from three security features to suit your individual needs. Plus, you can erase or initialize data with the crypto erase service through customer service.

TCG/Opal v2 **eDrive** **Class 0**

To ensure it won't let you down, the 850 PRO includes Dynamic Thermal Guard protection, which keeps your PC performance safe from overheat. After all, when you're totally immersed in your work or in a competitive video game, the last thing you want to have happen is for your computer to overheat. Dynamic Thermal Guard protection monitors and maintains the drive's optimal operating temperature. Its throttle feature automatically drops the SSD's temperature when necessary to protect your data and ensure the responsiveness you expect. So, your PC will stay cool, even if you overwork it - and you'll keep your cool, too.

Safe from Overheat

Level up to the 850 PRO simply without any hassle

One-Stop

Samsung has made upgrading to the 850 PRO simple using its One-stop Install Navigator software. You can migrate all the data to the 850 PRO quickly and easily. For example, 100GB of data can be migrated in just 24 minutes. The Auto Install guide, included in the toolkit, guides you through the simple, three-step migration process.
What's more, you can conveniently monitor, manage and maintain your new 850 PRO with the Samsung Magician software that's also available through the One-stop Install Navigator toolkit.

The Magician features tools to help you maximize performance, including benchmarking, advanced OS optimization, disk health status tracking and over-provisioning settings. You'll be amazed what you can do.

Ensure each component works together seamlessly

The four most crucial components of any SSD are the NAND flash memory, the controller, the DRAM and the firmware. Integration of each component is critically important in creating a high-quality, long-lasting SSD you can trust.
Samsung is one of the few manufacturers that actually design all four of these components in-house. And among those who do, Samsung has the most experience in the SSD market. Because Samsung has intimate knowledge of every component and its parts, it can fine-tune them at each stage of development to ensure they work seamlessly together. The result – enhanced performance with a 32-layer 3D V-NAND flash memory, lower power consumption with an up to 1GB LPDDR2 DRAM cache memory and improved energy efficiency with the 3-core MEX controller and firmware.