

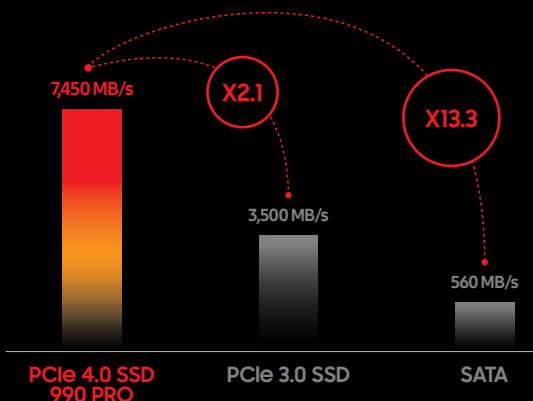
SAMSUNG

PCIe® 4.0 NVMe™ SSD 990 PRO | 990 PRO with Heatsink

Blistering speed, endless victory



* Source: 2003-2021 IHS Markit data:
NAND suppliers' revenue market share.



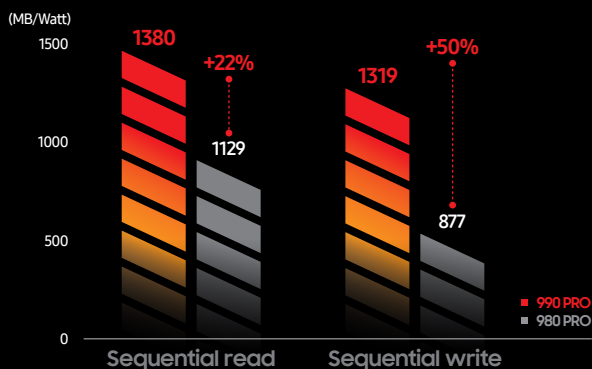
The ultimate SSD for an immersive gameplay experience

The best gameplay experience.

Sequential read/write speeds up to 7450/6900 MB/s reach near max performance of PCIe® 4.0.

Up to 55% improvement in random performance enables faster loads for ultimate gaming realism on PS5 and DirectStorage PC games.

The 990 PRO provides an optimal balance of speed, power efficiency and reliability making it an ideal solution for heavy gaming as well as creative tasks.



Breakthrough power efficiency

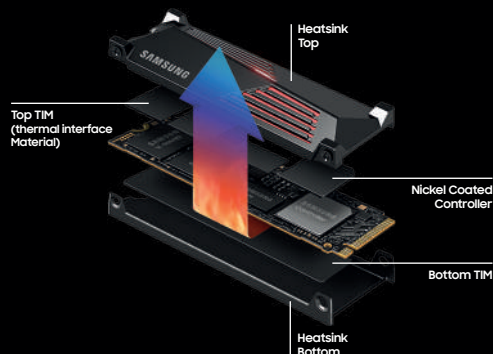
More power-efficient performance. Higher performance usually consumes more power. But, built on a low-power architecture, Samsung's newly designed controller dramatically improves SSD's power efficiency by up to 50% compared to the 980 PRO.

* Based on internal test results of the 1TB model.

Smart thermal solution

Sink that heat.

The slim heatsink dissipates heat to prevent performance drops from overheating. Get stable heat control, and minimal fan noise for heavy-graphic gaming. The thin body is compatible with PlayStation®5, desktops, and laptops meeting the PCI-SIG® D8 standard. The heatsink's futuristic design adds style to heat control, now with RGB lights.



Technical Specifications

		990 PRO			990 PRO with Heatsink		
Model Code		MZ-V9P1T0BW	MZ-V9P2T0BW	MZ-V9P4T0BW	MZ-V9P1T0CW	MZ-V9P2T0CW	MZ-V9P4T0CW
General Feature	Capacity	1TB	2TB	4TB	1TB	2TB	4TB
	Form Factor	M.2 (2280)					
	Interface	PCIe Gen 4.0 x 4, NVMe 2.0					
	Dimension (WxHxD)	80.00 x 22.00 X 2.30 (mm)			80.00 x 24.30 X 8.20 (mm)		
	Weight	Max 9.0 g			Max 28.0 g		
	Storage Memory	Samsung V-NAND 3bit TLC					
	Controller	Samsung in-house controller					
	DRAM Cache Memory	1GB LPDDR4	2GB LPDDR4	4GB LPDDR4	1GB LPDDR4	2GB LPDDR4	4GB LPDDR4
Performance	Sequential Read (MB/s)	7,450	7,450	7,450	7,450	7,450	7,450
	Sequential Write (MB/s)	6,900	6,900	6,900	6,900	6,900	6,900
	Random Read (IOPS)	1,200K	1,400K	1,400K	1,200K	1,400K	1,400K
	Random Write (IOPS)	1,550K	1,550K	1,550K	1,550K	1,550K	1,550K
Software	Management Software	Samsung Magician Software					
Warranty	TBW	600	1200	2400	600	1200	2400
	Period	5-year limited warranty					

* The NVMe Express™ design mark is a registered trademark of NVM Express, Inc.

* Results are based on a comparison with Samsung PCIe 3.0 NVMe SSDs and SATA SSDs.

* Sequential and random write performance was measured with Intelligent TurboWrite technology being activated. Intelligent TurboWrite operates only within a specific data transfer size.

* Performance may vary depending on SSD's firmware, system hardware & configuration and other factors. For detailed information, please contact your local service center.

* Test system configuration: AMD Ryzen 7 5800X 8-Core Processor CPU@3.80GHz, DDR4 3600MHz 16GBx2 (PC4-25600 Overclock), OS - Windows 10 Pro 64bit, Chipset - ASRock-X570 Taichi.

* PCIe 4.0's highest theoretical sequential read speed is 8,000 MB/s - 990 PRO reaches 7450 MB/s as of Q3 2022.

* TBW to be released in 2023.

* PCI-SIG® D8 standard spec: 8.8mm.

* DirectStorage technology from Microsoft loads games faster than before by leveraging the multiple GB/sec speed of modern NVMe SSDs.

* 1GB=1,000,000,000 bytes by IECMA. A certain portion of capacity may be used for system file and maintenance use, so the actual capacity may differ from what is indicated on the product label.

* Five years or TBW (Total Bytes Written), whichever comes first. For more information on the warranty, please refer to the enclosed warranty document in the package.

* Samsung's warranty will be void if any of the following instructions violated.

. When assembling the 990 PRO, do not overtighten the 990 PRO with Heatsink to the motherboard.

. The 990 PRO with Heatsink has a pre-installed heat sink and it should not be removed as it can damage the device.

. The max dimensions of the 990 PRO with Heatsink are 80.5 mm [L] x 25.15 mm [W] x 8.88mm [H]. Please check your host system provides sufficient space for installation in advance.

. Product warranty will be void if a heatsink is removed from 990 PRO with Heatsink.

* Samsung Electronics shall not be liable for any loss, including but not limited to loss of data or other information contained on Samsung Electronics product or loss of profit or revenue which may be incurred by user.

For more information on the warranty, please visit [samsung.com/ssd](https://www.samsung.com/ssd).

For more information about the Samsung SSD, visit [samsung.com/ssd](https://www.samsung.com/ssd)

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