

Samsung MZ-77Q1T0 V-NAND SSD Datasheet

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Samsung MZ-77Q1T0 V-NAND SSD



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- To download the latest software & manuals, please visit **www.samsung.com/samsungssd**

Revision History

Revision Number	Description	Revision Date
1.0	Initial Release	June 2020
1.1	Change in improved sustained performance figure (30%→21%) (p.4)	June 2020

The Quality and Value Optimized SSD

870 QVO is Samsung's 2nd generation high-density 4-bit MLC-based SSD with the new MKX controller, which comes in capacities up to 8TB, making it the world's largest client SSD. The predecessor 860 QVO contributed greatly to the growth of terabyte capacity sales in the SATA SSD market. Also, despite the concerns regarding the 4-bit

MLC SSD's performance and quality, 860 QVO has received overwhelmingly positive feedback from customers and tech media.
870 QVO gives enhanced optimized performance and proven reliability, which makes it an ideal solution for general users who require terabyte-capacity SSDs with improved everyday computing experiences.

Optimal Performance for Everyday Computing Experience

The 870 QVO provides best-in-class performance as sequential read (up to 560 MB/s) and writes (up to 530 MB/s) approaches the limits of performance available with the SATA interface. These improvements are accompanied by enhanced random performance, bringing up to 13% higher speeds than 860 QVO in low queue depth workloads (QD1) which makes it an ideal solution for everyday computing experiences.

Proven Reliability

With enhanced 9x layer V-NAND characteristics and a refined new controller with an advanced ECC algorithm, the 870 QVO promises to deliver worry-free endurance of up to 2,880TB of Total Bytes Written* along with a 3-year limited warranty. The sustained performance has been enhanced up to 21% higher than the predecessor 860 QVO, allowing 870 QVO to reliably provide better performance continuously for a longer time. Also, the endurance of Intelligent TurboWrite has been enhanced to last up to 3.8 times longer.

All documented endurance test results are obtained in compliance with JESD218 Standards. Please visit www.jedec.org for detailed information on JESD218 Standards

Overwhelming Capacity

The 870 QVO is the world's largest client SSD boasting 8TB capacity, which surpasses even the largest capacity HDDs with 2.5" form factors. The fine-tuned MKX controller and enhanced V-NAND technology made it possible to build an 8TB SSD in a 2.5" 7mmT form factor.

The largest capacity of SSD 8TB & HDD 5TB as of Q3, 2020.

Samsung Data Migration and Magician Software

Samsung Magician and Data Migration software support the 870 QVO. These software programs provide consumers with powerful and convenient features with simple to use in managing their Samsung SSDs. The Samsung Magician software offers a personalized experience that varies based on the Samsung SSD in use, with different functions available for different SSDs. Samsung Data Migration software is renewed with a unified design with Magician, giving a very convenient upgrade experience to Samsung SSD users. It provides a very powerful “Custom Cloning” feature that enables migration work even when source data is greater than the SSD’s capacity.

To download Samsung Magician and Data Migration, please visit www.samsung.com/samsungssd

TECHNICAL SPECIFICATIONS

Samsung SSD 870 QVO						
Usage Application	Client PCs					
Interface	SATA 6 Gbps Interface, compatible with SATA 3 Gbps & 1.5 Gbps interfaces					
Hardware Information	Capacity1)		1TB	2TB	4TB	8TB
	Controller		Samsung MKX Controller			
	NAND Flash Memory		Samsung 4bit MLC V-NAND			
	DRAM Cache Memory		1GB LPDDR4	2GB LPDDR4	4GB LPDDR4	8GB LPDDR4
	Dimension		100x 69.85x 6.8(mm)			
	Form Factor		2.5 inch			
Performance (Up to)2)	Sequential Read		560 MB/s			
	Sequential Write3)		530 MB/s			
	4KB Ran. Read (QD1)4)		11,000	11,000	11,000	11,000
	4KB Ran. Write (QD1)4)		35,000	35,000	35,000	35,000
	4KB Ran. Read (QD32)5)		98,000	98,000	98,000	98,000
	4KB Ran. Write (QD32)5)		88,000	88,000	88,000	88,000
Power Consumption6)	Idle	DIPM on	30mW	30mW	35mW	45mW
	Active (Avg.)	Read/Write	2.1W/2.2W	2.1W/3.0W	2.2W/3.2W	2.4W/3.3W
	Device Sleep		3mW	4mW	7mW	10mW
	Temp.	Operating	0°C to 70°C			
		Non-Operating	-45°C to 85°C			

Reliability	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	Total Byte Written7)		360TB	720TB	1,440TB	2,880TB
	Period		3 years limited8)			
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)					

- **GB:** 1GB = 1,000,000,000 bytes. A certain portion of capacity may be used for system file and maintenance use, thus the actual capacity may differ from that indicated on the product label.
- 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 i7-7700K CPU@4.20GHz, DDR4 1200MHz 32GB, OS-Windows 10 Pro 64bit, Chipset-ASUS PRIME Z270-A.
- Sequential write performance measurements are based on Intelligent TurboWrite technology. Performances after Intelligent Turbowrite are 80 MB/s (1TB), and 160 MB/s (2/4/8TB).
- QD1 Random performances after Intelligent TurboWrite are 0K IOPS (1/2/4/8TB) for reads, 22K IOPS (1TB), and 34K IOPS (2/4/8TB) for writes.
- QD32 Random performances after Intelligent TurboWrite are 45K IOPS (1TB) and 74K IOPS (2/4/8TB) for reads, and 22K IOPS(1TB), 42K IOPS(2/4/8TB) for writes.
- Power consumption is measured with IOmeter1.1.0 version with Intel Core i7-7700K @ 4.2GHz, SAMSUNG DDR4 8GB, Gigabyte GA-Z270X, OS – Windows 10 PRO
- All documented endurance test results are obtained in compliance with JESD218 Please visit **www.jedec.org** for detailed information on JESD218 Standards
- Please refer to the detailed warranty statement here at **http://www.samsung.com/samsungssd**

PRODUCT LINEUP

Density	Model Name	Box Contents	Model Code
1TB (1,000GB*)	MZ-77Q1T0	Samsung SSD 870 QVO 1TB Warranty Statement	MZ-77Q1T0BW MZ-77Q1T0B/AM MZ-77Q1T0B/CN
2TB (2,000GB*)	MZ-77Q2T0	Samsung SSD 870 QVO 2TB Warranty Statement	MZ-77Q2T0BW MZ-77Q2T0B/AM MZ-77Q2T0B/CN
4TB (4,000GB*)	MZ-77Q4T0	Samsung SSD 870 QVO 4TB Warranty Statement	MZ-77Q4T0BW MZ-77Q4T0B/AM MZ-77Q4T0B/CN
8TB (8,000GB*)	MZ-77Q8T0	Samsung SSD 870 QVO 8TB Warranty Statement	MZ-77Q8T0BW MZ-77Q8T0B/AM MZ-77Q8T0B/CN

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** and **www.samsungssd.com.**

FAQ's

How can I determine if my Samsung SSD is real?

With the Magician program that is provided on the CD, you may determine whether the Samsung SSD product you have purchased is genuine. On the Magician main screen, "Genuine" will be seen next to the serial number if the product is authentic. "Not Authentic" will be shown if it is not authentic.

The speed of the Samsung 1TB SSD.

Its 1TB of memory offers plenty of space for movie files, work archives, and game downloads, and its top read and write speeds of 550MB/s and 520MB/s facilitate fast data transfers. SATA 6 Gb/s, 3 Gb/s, and 1.5 Gb/s interfaces are all compatible with this Samsung 860 Evo series solid-state drive.

How long does a Samsung SSD last?

whatever occurs first, 5 years or TBW (250 GB: 75 TBW; 500 GB/1 TB: 150 TBW; 2/4 TB: 300 TBW).

How durable is my Samsung SSD?

SSDs are extremely dependable because they don't have any moving parts. In actuality, the majority of SSDs can last over five years, and the longest-lasting models can last over ten. However, the longevity of your SSD will be determined by how frequently you write data onto it; you can use this information to predict the lifespan.

A Samsung SSD may fail.

SSDs can be significantly speedier and more dependable than conventional hard disc drives (HDDs). They do, however, occasionally still run into issues and even fail.

Samsung SSD: Is a power cord required?

JUST SSD in a packet or box. To connect to this SSD, you need a SATA cable and a power supply of your own.

Which Samsung SSD is the best?

If you're seeking to add some storage via a standard 2.5-inch SATA drive rather than a tiny M. 2 "gum stick," Samsung's excellent 870 EVO is your best chance. It's the fastest SATA SSD we've tested, comes in capacities of up to 4TB, and is incredibly cost-effective considering its speed.

Where is the data stored on an SSD?

SSDs use flash memory to permanently store data on an integrated circuit.

A Samsung SSD uses how many watts?

A SATA SSD typically uses less than 4W of power at its utmost, but higher-end NVMe devices can need up to 8.5W or more.

How long is QVO effective?

In addition to the Turbo Write technology, Low-Density Parity-Check (LDPC) ECC guarantees data integrity. Samsung warrants the 870 QVO to write up to 360TB of data for every 1TB of capacity, or for a three-year lifespan, whichever comes first.

What is the Samsung SSD's maximum capacity?

While Samsung's sixth-generation, 128-layer V-NAND provides capacities as high as 30.72TB, dual ports increase dependability.

What leads to SSD failure?

SSDs will ultimately fail for the basic reason that NAND flash can only endure so many read/write cycles.

How long is the SSD powered off?

Generally, if an SSD is left without power for a long period of time, data loss may occur. An SSD can store your data for at least 2 to 5 years without a power source, according to a study. Several SSD manufacturers also assert that SSD can store data for up to 20 years without a regular power source.

Does SSD deteriorate over time?

If your device has a solid-state drive (SSD), you've definitely seen that as it fills up, performance substantially decreases. You'll notice this when operations like copying files and starting apps take longer than usual. In certain cases, this may also result in freezing problems that make it more difficult to use your device.

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