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# TECHNICAL SPECIFICATIONS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Samsung SSD 980 PRO with Heatsink | | | | |
| Usage Application | Client PCs | | | |
| Interface | PCIe Gen 4.0 x4, NVMe 1.3c | | | |
| Hardware Information | Capacity1) | | 1TB | 2TB |
| Controller | | Samsung in-house Controller | |
| NAND Flash Memory | | Samsung V-NAND 3bit MLC | |
| DRAM Cache Memory | | 1GB LPDDR4 | 2GB LPDDR4 |
| Dimension | | Max 80.15 x Max 24.15 x Max 8.6 (mm) | |
| Form Factor | | M.2 (2280) | |
| Performance  (Up to.)2) 3) 4) | Sequential Read | | 7,000 MB/s | 7,000 MB/s |
| Sequential Write | | 5,000 MB/s | 5,100 MB/s |
| QD 1 Thread 1 | Ran. Read | 22K IOPS | 22K IOPS |
| Ran. Write | 60K IOPS | 60K IOPS |
| QD 32 Thread 16 | Ran. Read | 1,000K IOPS | 1,000K IOPS |
| Ran. Write | 1,000K IOPS | 1,000K IOPS |
| Power  Consumption (Up to)5) | Idle (ASPT on) | | 35mW | |
| Active (Avg.) | Read | 6.2 W | 6.1W |
| Write | 5.7 W | 5.6W |
| L1.2 mode | | 5 mW | |
| Reliability | Temp. | Operating | 0°C to 70°C  (Measured by S.M.A.R.T. Temperature Proper airflow recommended) | |
| Non-Operating | -40°C to 85°C | |
| Humidity | | 5% to 95% non-condensing | |
| Shock | Non-Operating | 1,500G(Gravity), duration: 0.5ms, 3 axis | |
| Vibration | Non-Operating | 20~2,000Hz, 20G | |
| MTBF | | 1.5 million hours | |
| Warranty6) | TBW | | 600TB | 1,200TB |
| Period | | 5 years limited | |
| 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. 1GB = 1,000,000,000 bytes by IDEMA. A certain portion of capacity may be used for system file and maintenance use, thus the actual available capacity may differ from the labeled capacity.
2. 980 PRO with Heatsink is backward compatible with PCIe 3.0. Sequential performances (up to): 3500 MB/s for reads, 3450 MB/s (1TB), 3470MB/s (2TB) for writes. Random performances (up to): 690K IOPS (1TB), 680K IOPS (2TB) for reads, 660K IOPS (1TB), 630K IOPS (2TB) for writes.
3. Sequential and random performance measurements are based on IOmeter1.1.0. Performance may vary based on SSD’s firmware version, system hardware & configuration. Test System: AMD Ryzen 9 3900X 12-Core Processor CPU@3.79GHz, DDR4 2666MHz 16GBx2, OS-Windows 10 Pro 64bit, Chipset-ASUS-X570-ROG CROSSHAIR VIII FORMULAv
4. Sequential and random write performance was measured with Intelligent Turbo Write technology being activated. Intelligent TurboWrite operates only within a specific data transfer size. For detailed information, please contact your local service center
5. Power consumption is measured with IOmeter1.1.0 version with AMD Ryzen 7 3700X 8 Core @3.6GHz, DDR4 8GBx2, OS-Windows 10 Pro 64bit, Chipset-GIGABYTE-X570-AORUS MASTER
6. Samsung's warranty will be void if any of the following instructions violated.
   * When assembling the 980 PRO, do not overtighten the 980 PRO with Heatsink to the motherboard.
   * The 980 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 980 PRO with Heatsink with heatsink are 80.15 mm [L] x 24.15 mm [W] x 8.6mm [H]. Please check your host system provides sufficient space for installation in advance.
   * Product warranty will be void if a heatsink is removed from 980 PRO with Heatsink.
7. All documented endurance test results are in compliance with JESD218 Standards. Please visit www.jedec.org for detailed information on JESD218 Standards. TBW means Terabytes Written, Warranty provides coverage for the stated time period or the TBW, whichever comes first. Please refer to the detailed warranty statement here a[t http://www.samsung.com/samsungssd](http://www.samsung.com/samsungssd)

# PRODUCT LINEUP

|  |  |  |  |
| --- | --- | --- | --- |
| Density | Model Name | Box Contents | Model Code |
| 1TB  (1,000GB\*) | MZ-V8P1T0 | Samsung SSD 980 PRO with Heatsink 1TB Warranty Statement | MZ-V8P1T0CW |
| 2TB  (2,000GB\*) | MZ-V8P2T0 | Samsung SSD PRO with Heatsink PRO 2TB Warranty Statement | MZ-V8P2T0CW |

\* GB: 1GB = 1,000,000,000 bytes. 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, and to download the latest software & manuals, please visit www.samsung.com/ssd an[d www.samsungssd.com](http://www.samsungssd.com/)

# TEST CONFIGURATION

Below you will find a list of system configurations Samsung used to obtain the results reported in this Data Sheet. All performance data was measured with the SSD as a secondary drive

|  |  |  |
| --- | --- | --- |
|  | Read/Write Performance | Power Consumption |
| Interface | PCIe Gen 4.0 x4 | PCIe Gen 4.0 x4 |
| OS | Windows 10 Pro 64bit | Windows 10 Pro 64bit |
| CPU | AMD Ryzen 9 3900X 12-Core CPU@3.79GHz | AMD Ryzen 7 3700X 8 Core @3.6GHz |
| Memory | DDR4 2666MHz 16GBx2 | DDR4 8GBx2 |
| Chipset | ASUS-X570-ROG CROSSHAIR VIII FORMULAv | GIGABYTE-X570-AORUS MASTER |
| Test Program | IOmeter 1.1.0 | IOmeter 1.1.0 |

The test values in the review were obtained under the following BIOS settings.

1. BIOS version: 1201(2019/11/18)
2. Advanced/AMD CBS/CPU Common Options/Global C-state Control: Auto -> Disabled 3) Overclock
   1. Ai Overclock Tuner: Default -> Manual
   2. Memory Frequency: Auto -> DDR4-3600MHz
   3. Core Performance Boost: Auto -> Disabled
   4. CPU Core Ratio: Auto -> 43.75
   5. Precision Boos Overdrive/Precision Boost Overdrive: Auto -> Disabled
   6. DRAM Timing Control/DRAM CAS# Latency: Auto -> 17 DRAM Timing Control/Trcdrd : Auto -> 19

DRAM Timing Control/Trcdwr : Auto -> 19

DRAM Timing Control/DRAM RAS# PRE Time: Auto -> 18

DRAM Timing Control/DRAM RAS# ACT Time: Auto -> 36

* 1. DRAM Voltage: Auto -> 1.35

# Revision History

|  |  |  |
| --- | --- | --- |
| Revision Number | Description | Revision Date |
| 1.0 | Initial Release | October, 2022 |