



MINERVA

EP6104 PCIe x16 Gen 5 with ReDriver to MCIO 38P Quad Port

Performance & Burn In Test Rev 1.0

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4. Summary

EP6104 Add-in Card

1. Overview

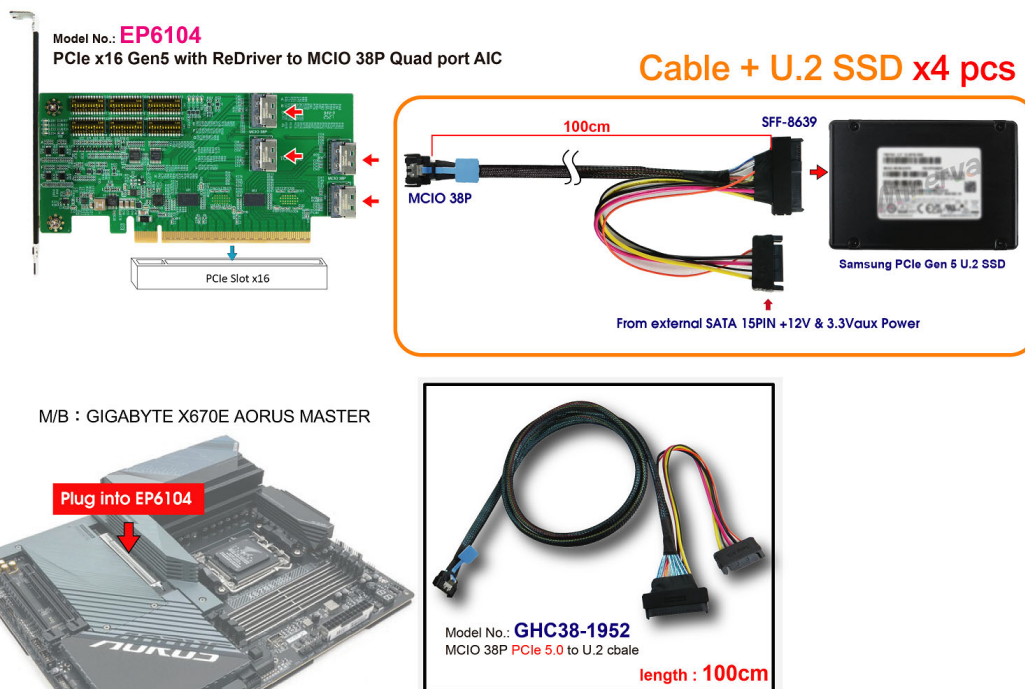
This Add-on Card is built-in MCIO 38P(SFF-TA-1016) quad port connector. It is designed for be used by PCIe x16 link width to configure four x4 bifurcations which could be extended PCIe 5.0 signals. The ReDriver on board may support CTLE to boost up to **22 dB at 16 GHz**.

2. Tools and Results of Performance Measurement

2.1 Test Platform:

- M/B : GIGABYTE **X670E AORUS MASTER**
- CPU : AMD **Ryzen 5, 7600X 6-Core**
- Memory : Kingston **KF556C36BBEK2, DDR5-5600MT/s, 64GB**(32GB DIMM*2)
- ATX Power : Apexgaming AN-550, **550W ATX**, 12V V2.2 Power Supply
- AIC: EP6104 PCIe x16 Gen 5 with Redriver to MCIO 38P quad port ADD-in Card
- Cable: PCIe 5.0 MCIO 38P to U.2(SFF-8639), **100cm** Cable
- OS : Microsoft **Windows 11 64bit OS**

2.2 Test target: EP6104 AIC & Samsung **U.2 PM1783 / 15.36TB NVMe SSD**



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2.3 Install Hardware

First inserts the U.2 SSD into the GHC38-1952 cable's SFF-8639 connector and connects to the EP6104 AIC card (PCIe x16 Gen 5 to MCI0 38Px4). The EP6104 AIC plugs into PCIe x16 Slot of GIGABYTE **X670E AORUS MASTER**.

2.4 BIOS & Windows 10 OS environment setup

2.4.1 Primary SATA NVMe SSD install Windows 11 OS.

2.4.2 U.2 NVMe SSD, formatted to NTFS Mode. Don't install any program.

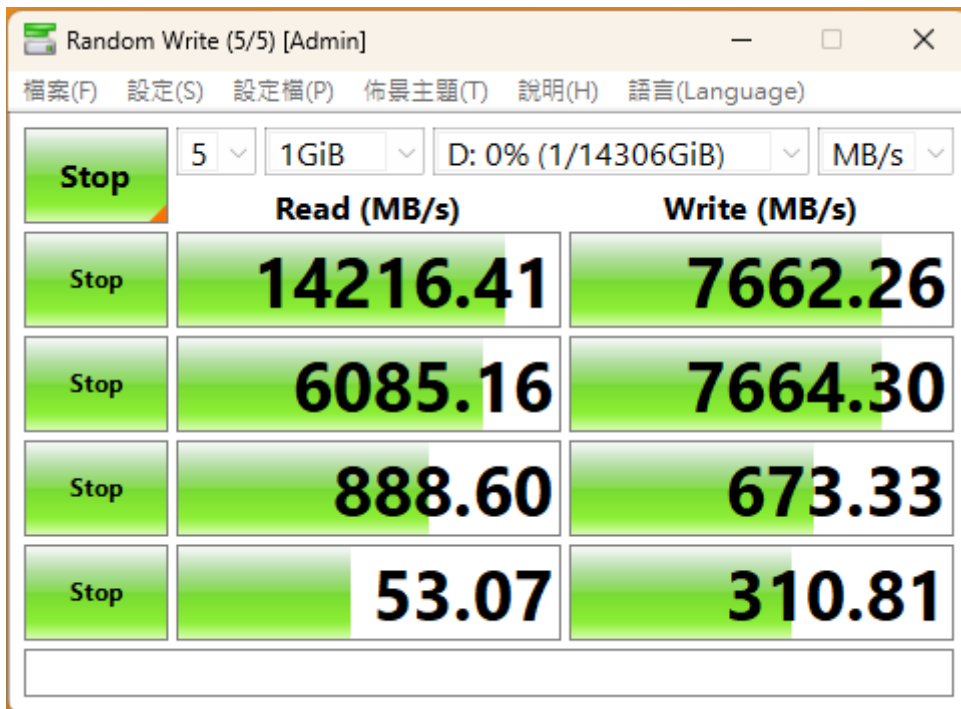


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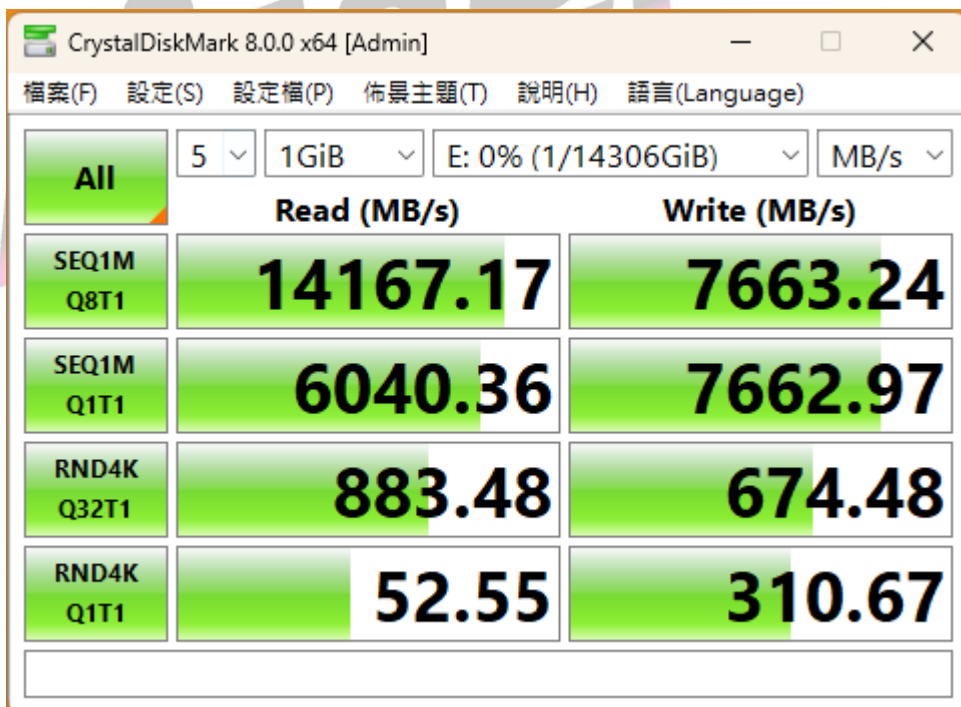
2.5 CrystalDiskMark 8.0.0 x64 performance test

※Benchmark (Sequential **Read & Write** / default = **1MB**)

2.5.1 Samsung **U.2/15.36TB** performance in Drive D: (For **Lane 0~ Lane 7**) as below:



2.5.2 Samsung **U.2/15.36TB** performance in Drive E: (For **Lane 0~ Lane 7**) as below:



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2.5.3 Samsung **U.2/15.36TB** performance in Drive D: (For **Lane 8~ Lane 15**) as below:

	Read (MB/s)	Write (MB/s)
SEQ1M Q8T1	14184.93	7663.25
SEQ1M Q1T1	6075.88	7662.91
RND4K Q32T1	878.05	671.55
RND4K Q1T1	52.52	310.67

2.5.4 Samsung **U.2/15.36TB** performance in Drive E: (For **Lane 8~ Lane 15**) as below:

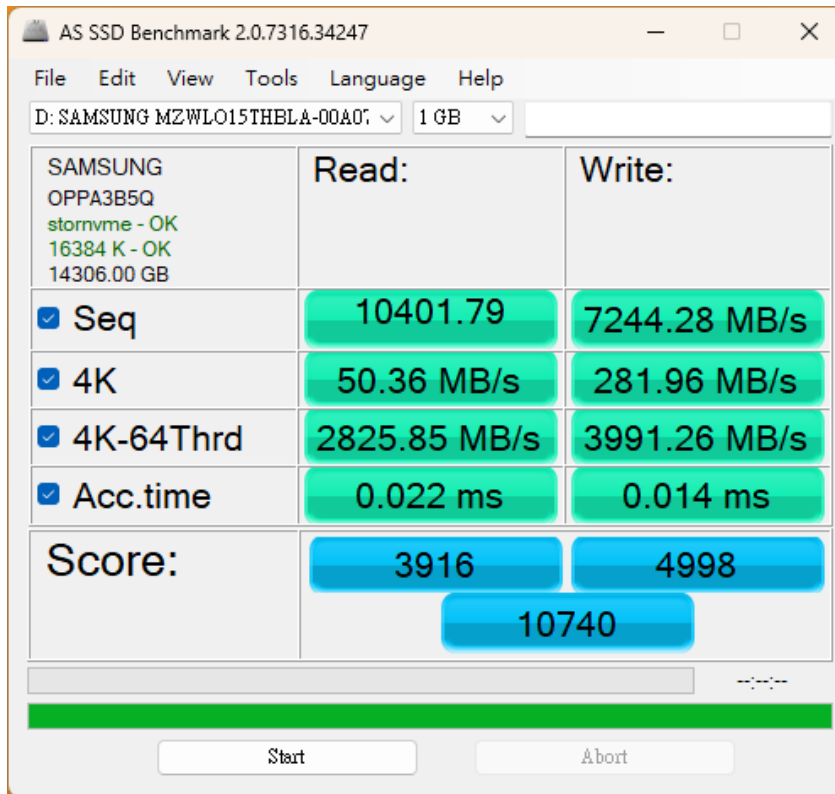
	Read (MB/s)	Write (MB/s)
SEQ1M Q8T1	14193.50	7479.52
SEQ1M Q1T1	6088.28	7505.88
RND4K Q32T1	883.28	671.34
RND4K Q1T1	52.52	310.68

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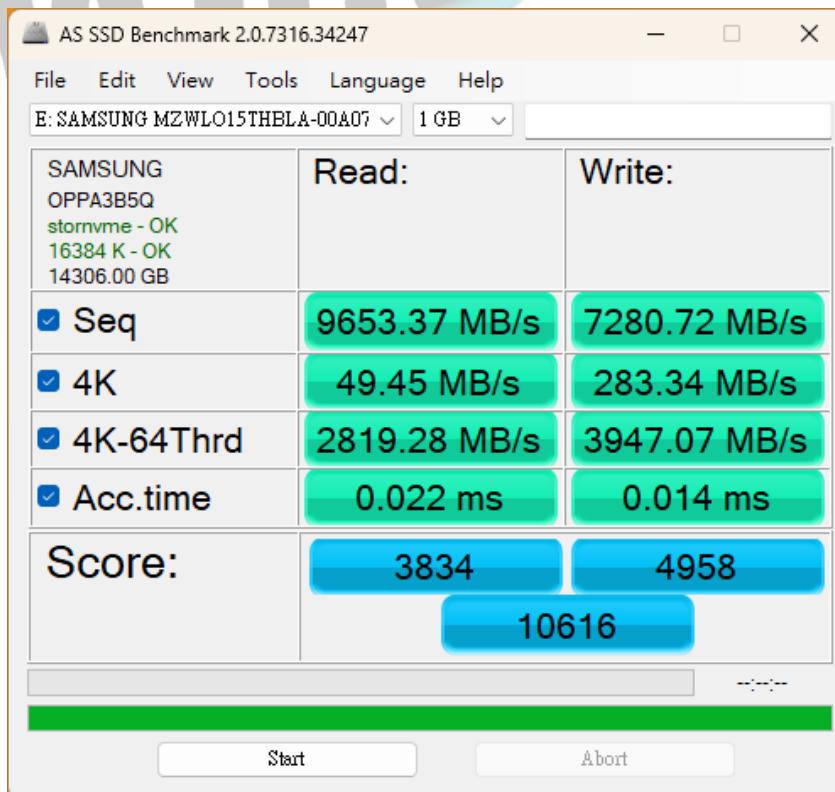
2.6 AS SSD Benchmark 2.0 performance test

✂Benchmark (Read & Write by MB/s, default block size = 16MB)

2.6.1 Samsung U.2/15.36TB performance in Drive D: (For Lane 0~ Lane 7) as below:



2.6.2 Samsung U.2/15.36TB performance in Drive E: (For Lane 0~ Lane 7) as below:



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2.6.3 Samsung U.2/15.36TB performance in Drive D: (For Lane 8~ Lane 15) as below:

	Read:	Write:
SAMSUNG OPPA3B5Q stornvme - OK 16384 K - OK 14306.00 GB		
<input checked="" type="checkbox"/> Seq	10381.66	7180.72 MB/s
<input checked="" type="checkbox"/> 4K	50.01 MB/s	283.62 MB/s
<input checked="" type="checkbox"/> 4K-64Thrd	2822.81 MB/s	3846.81 MB/s
<input checked="" type="checkbox"/> Acc.time	0.022 ms	0.014 ms
Score:	3911	4849
	10580	

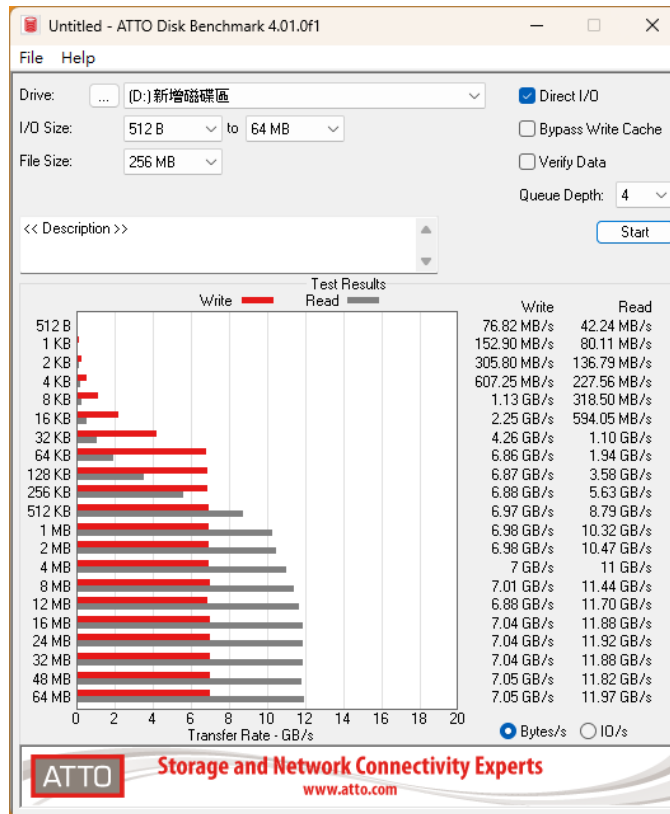
2.6.4 Samsung U.2/15.36TB performance in Drive E: (For Lane 8~ Lane 15) as below:

	Read:	Write:
SAMSUNG OPPA3B5Q stornvme - OK 16384 K - OK 14306.00 GB		
<input checked="" type="checkbox"/> Seq	9757.29 MB/s	7293.88 MB/s
<input checked="" type="checkbox"/> 4K	49.40 MB/s	281.91 MB/s
<input checked="" type="checkbox"/> 4K-64Thrd	2827.95 MB/s	3731.78 MB/s
<input checked="" type="checkbox"/> Acc.time	0.022 ms	0.014 ms
Score:	3853	4743
	10424	

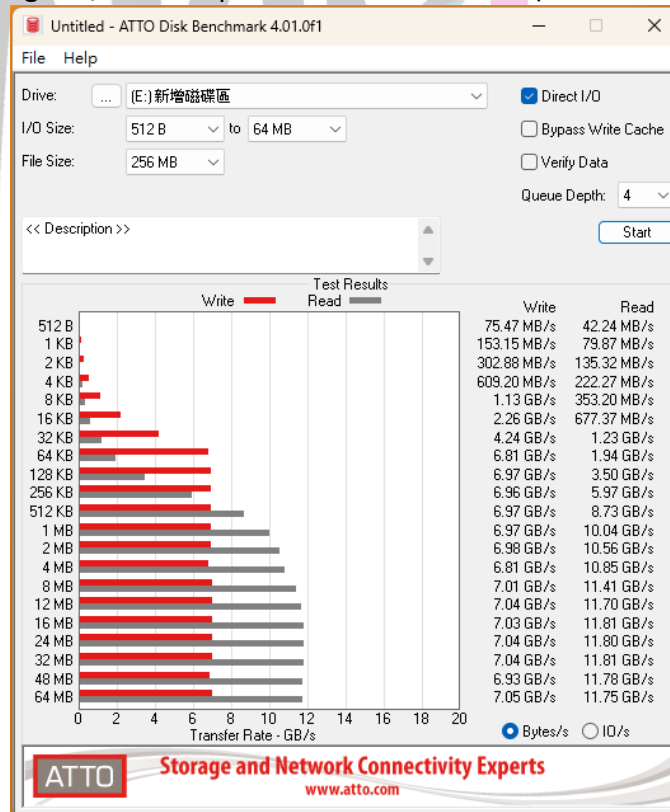
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2.7 ATTO Disk Benchmark 4.01 performance test

2.7.1 Samsung U.2/15.36TB performance in Drive D: (For Lane 0~ Lane 7) as below:

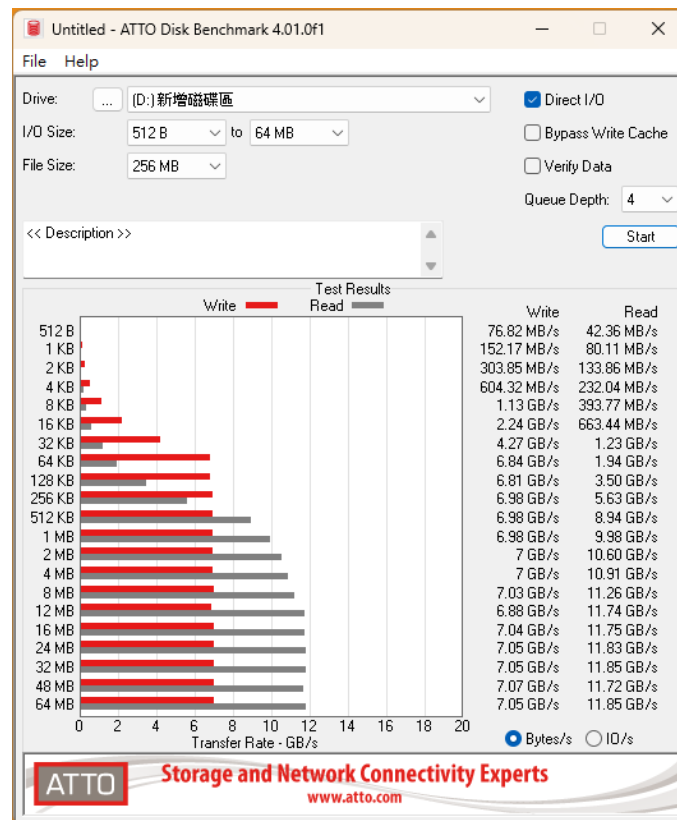


2.7.2 Samsung U.2/15.36TB performance in Drive E: (For Lane 0~ Lane 7) as below:

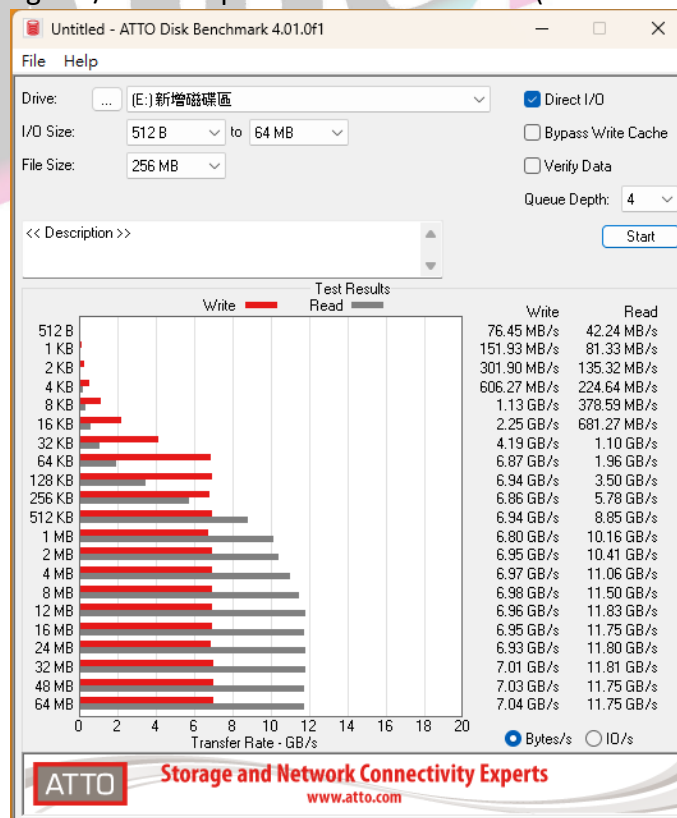


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2.7.3 Samsung U.2/15.36TB performance in Drive D: (For Lane 8~ Lane 15) as below:



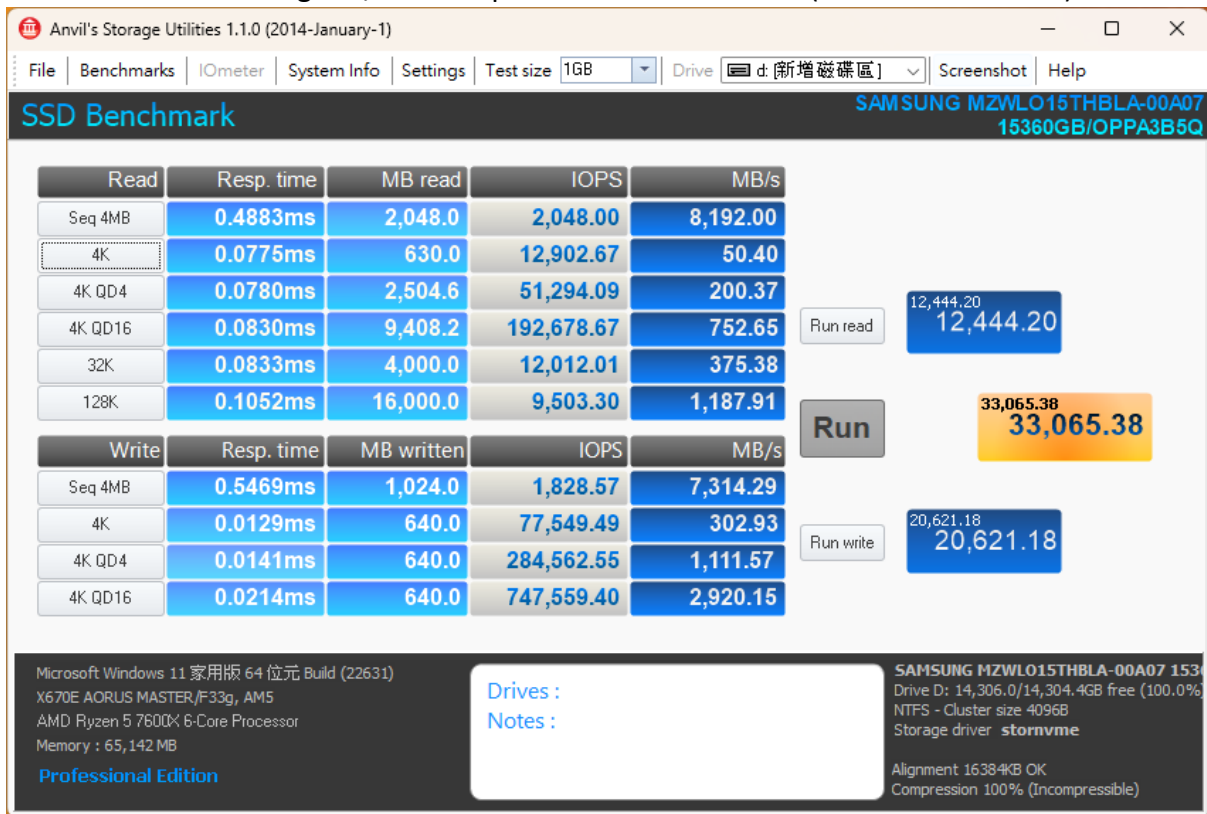
2.7.4 Samsung U.2/15.36TB performance in Drive E: (For Lane 8~ Lane 15) as below:



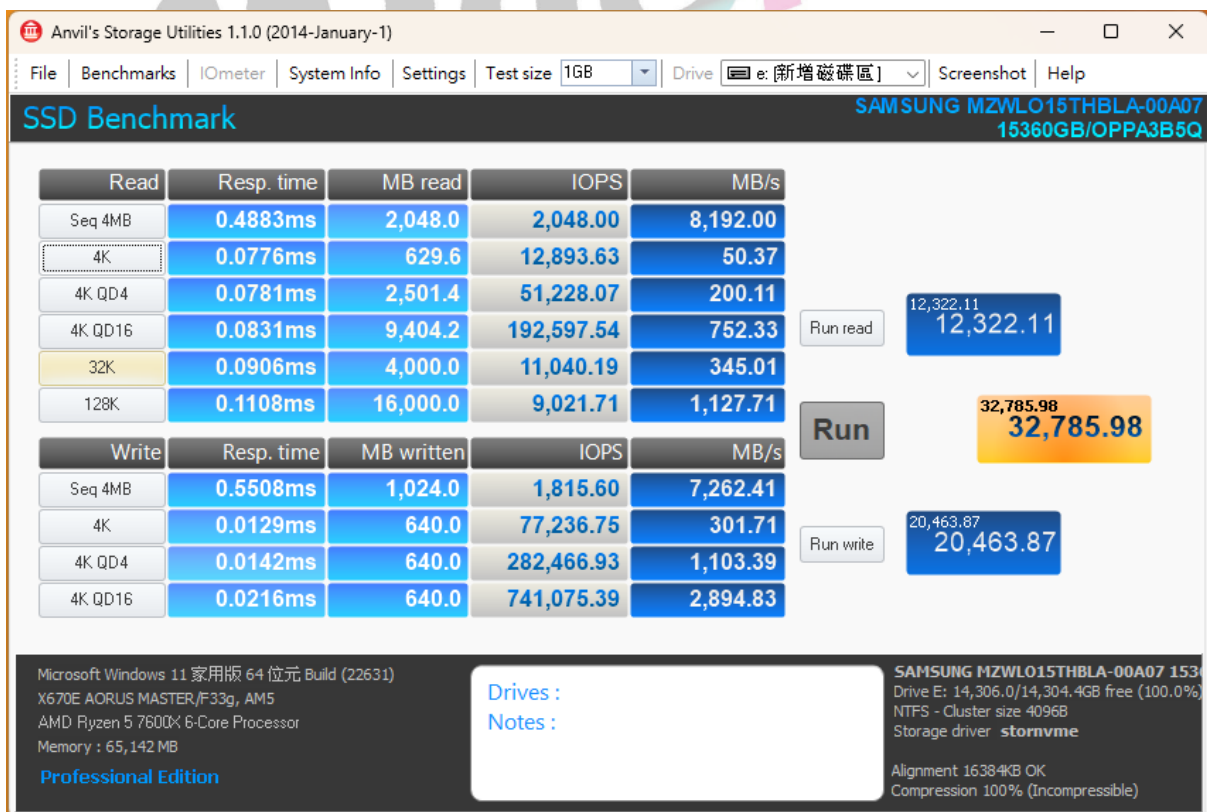
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2.8 AnvilBenchmark_V110_B337

2.8.1 Samsung U.2/15.36TB performance in Drive D: (For Lane 0~ Lane 7) as below:

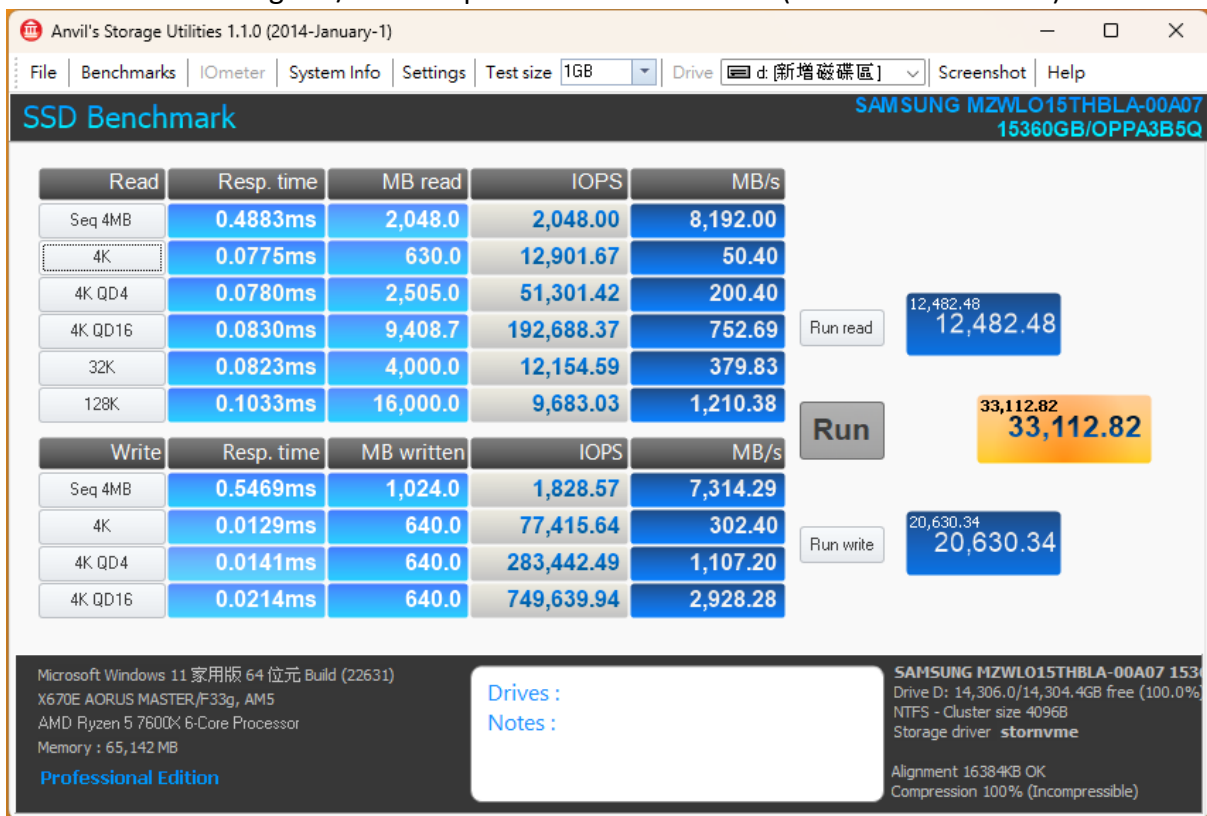


2.8.2 Samsung U.2/15.36TB performance in Drive E: (For Lane 0~ Lane 7) as below:



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2.8.3 Samsung U.2/15.36TB performance in Drive D: (For Lane 8~ Lane 15) as below:



2.8.4 Samsung U.2/15.36TB performance in Drive E: (For Lane 8~ Lane 15) as below:

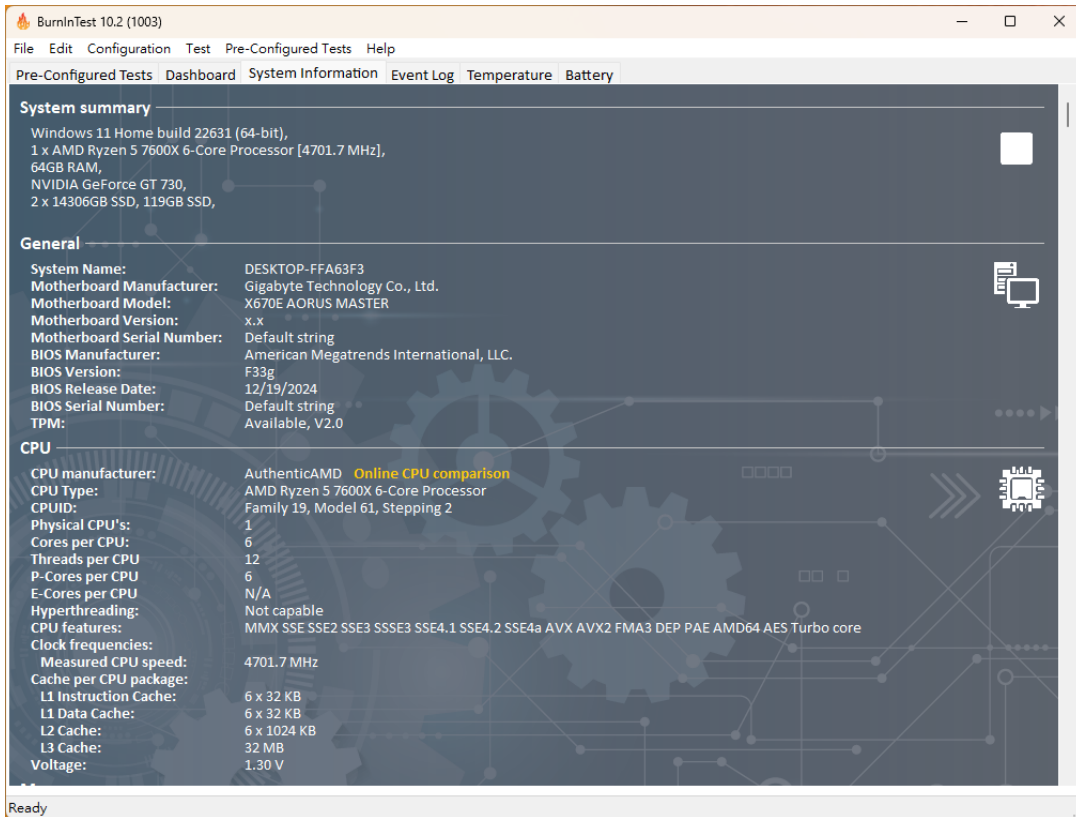


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3. Burn In Tests and Results

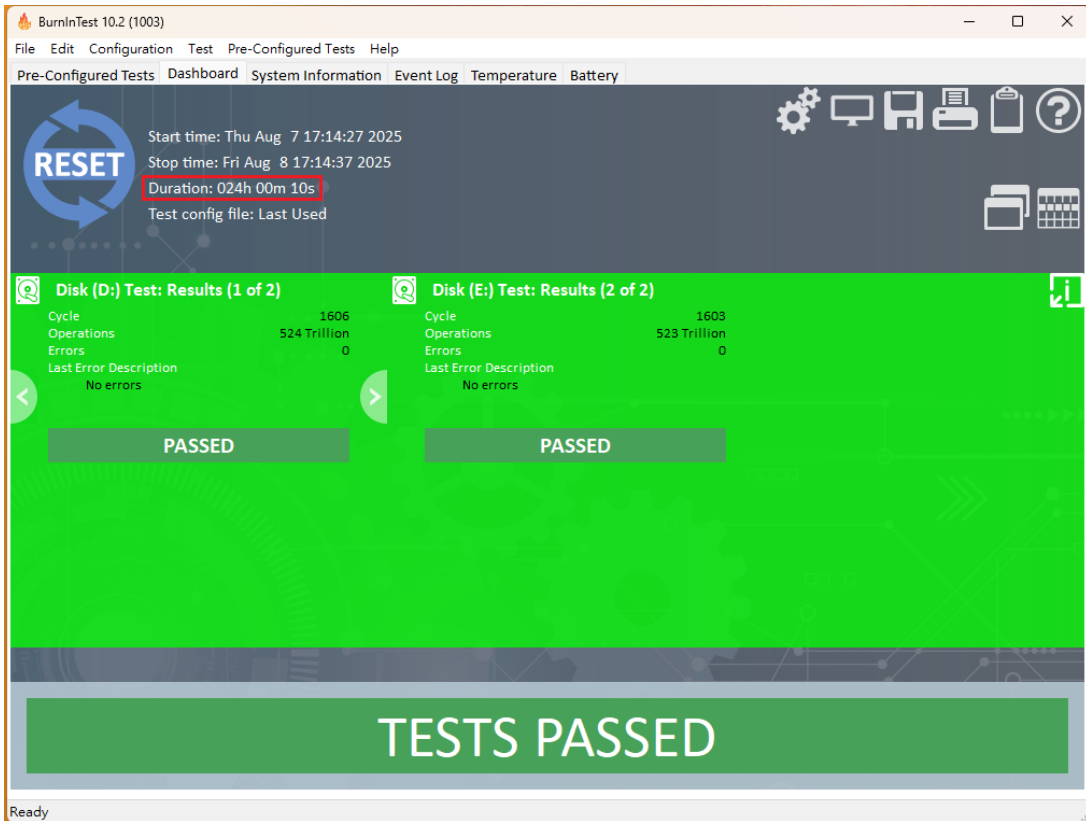
3.1 BurnInTest v10.1 Pro

3.1.1 system information as below:



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3.1.2 24-hour Burn-in test PASSED For Lane 0~ Lane 7



3.1.3 24-hour Burn-in test PASSED For Lane 8~ Lane 15



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4. Summary

- 4.1 EP6104 AIC is PCIe x16 Gen 5 with MCI/O 38P quad port
- 4.2 U.2 NVMe SSD is PCIe 5.0 / 4 Lane Interface, I/O speed, max. to 128Gbps.
- 4.3 EP6104 AIC I/O performance is based on U.2 NVMe SSD.

