MINERVA

EP8102 PCIe x8 Gen 5 with ReDriver to MCIO 38P Dual port

Performance & Burn In Test   Rev 1.0

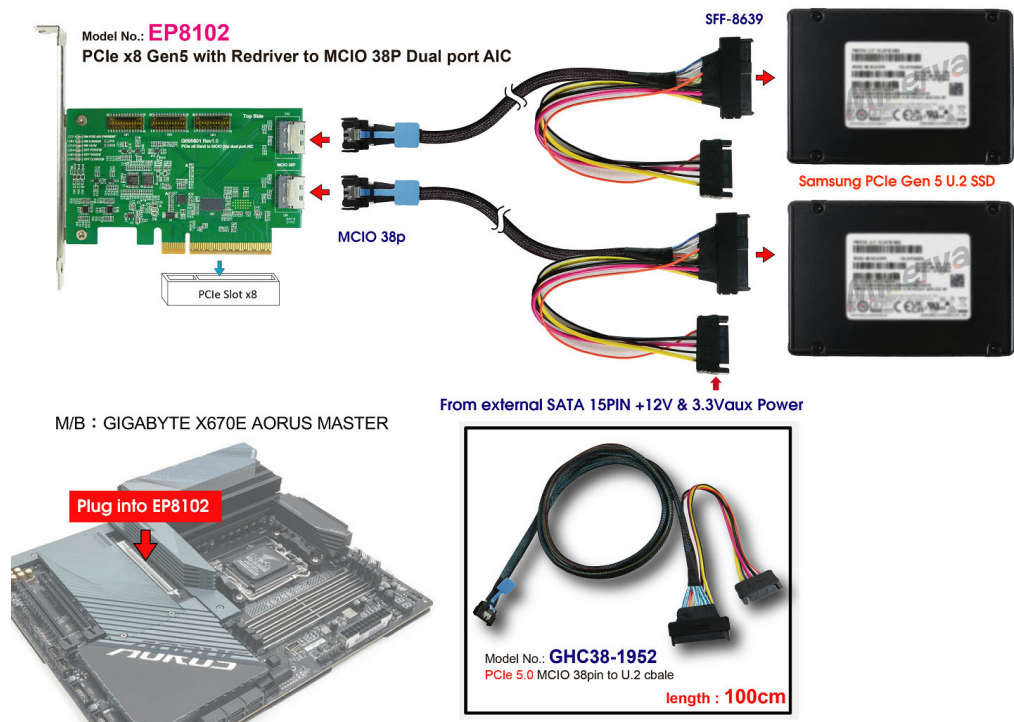## Table of Contents

EP8102 Add-in Card

1. Overview

This Add-on Card is built-in MCIO 38P(SFF-TA-1016) dual port connector. It is designed for be used by PCIe x8 link width to configure two 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: EP8102 PCIe x8 Gen 5 with Redriver to MCIO 38P dual 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: EP8102 AIC & Samsung **U.2 PM1783** / **15.36TB** **NVMe SSD**

2.3   Install Hardware

First inserts the U.2 SSD into the GHC38-1952 cable's SFF-8639 connector and connects to the EP8102 AIC card (PCIe x8 Gen 5 to MCIO 38Px2). The EP8102 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 10 OS.

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

EP8102 Add-in Card

2.5   CrystalDiskMark 8.0.0 x64 performance test
    ※Benchmark (Sequential Read & Write / default = 1MB)
    2.5.1   Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

    2.5.2   Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

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 PM1783 / 15.36TB SSD** performance with 100cm cable as below:
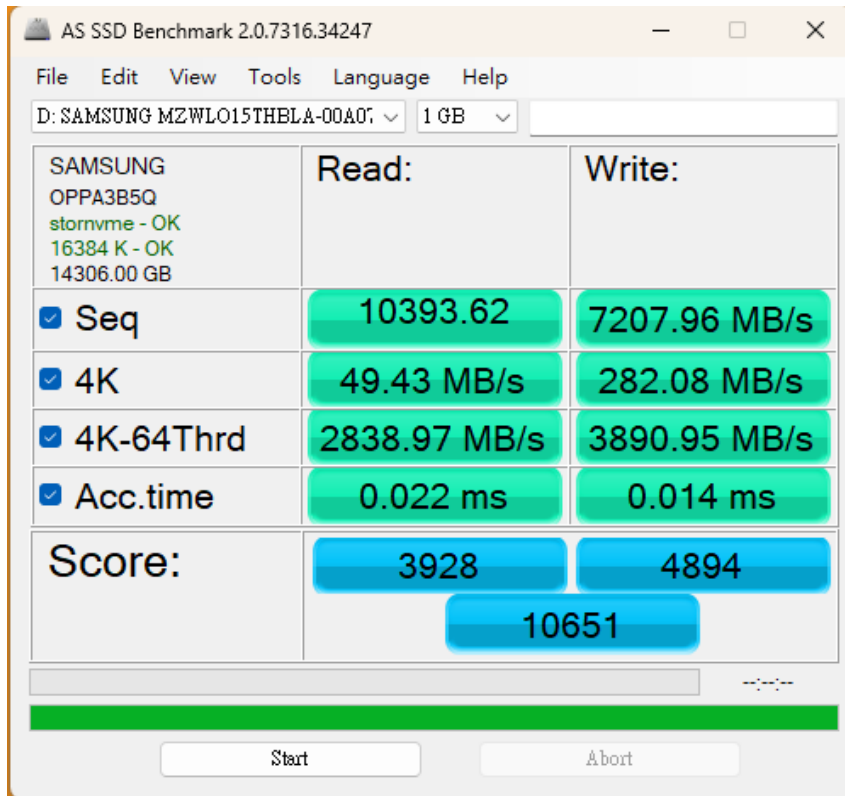
2.6.2 Samsung **U.2 PM1783 / 15.36TB SSD** performance with 100cm cable as below:

2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1   Samsung **U.2 PM1783 / 15.36TB SSD** performance with 100cm cable as below:

2.7.2   Samsung **U.2 PM1783 / 15.36TB SSD** with 100cm cable as below:

2.8   AnvilBenchmark_V110_B337

2.8.1   Samsung **U.2 PM1783 / 15.36TB SSD** performance with 100cm cable as below:

Anvil's Storage Utilities 1.1.0 (2014-January-1)

File | Benchmarks | IOmeter | System Info | Settings | Test size 1GB | Drive [d: 新增磁碟區] | Screenshot | Help

SSD Benchmark   SAMSUNG MZWLO15THBLA-00A07
                                                        15360GB/OPPA3B5Q

Read	Resp. time	MB read	IOPS	MB/s
Seq 4MB	0.4883ms	2,048.0	2,048.00	8,192.00
4K	0.0776ms	629.2	12,886.76	50.34
4K QD4	0.0780ms	2,503.9	51,279.67	200.31
4K QD16	0.0830ms	9,407.8	192,670.59	752.62
32K	0.0823ms	4,000.0	12,154.59	379.83
128K	0.1041ms	16,000.0	9,603.84	1,200.48

Run read 12,467.02

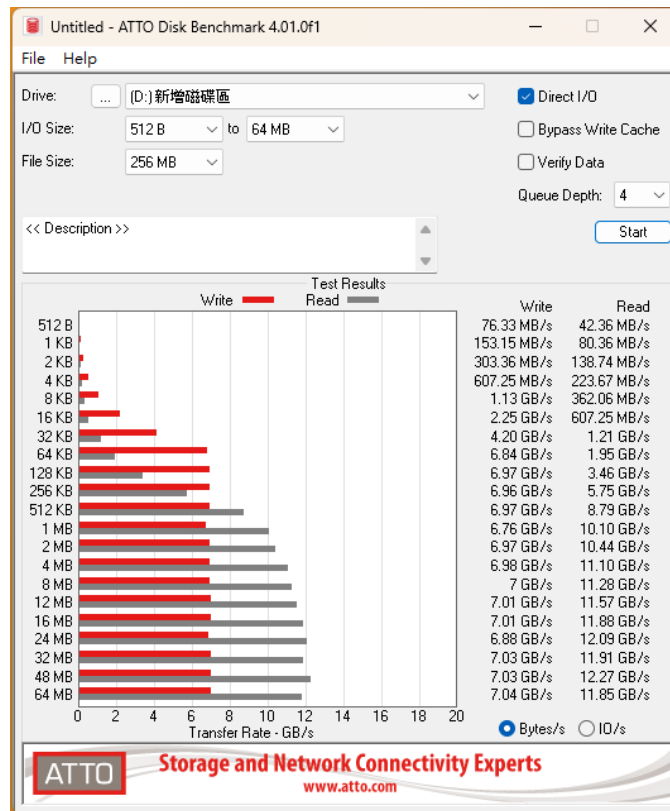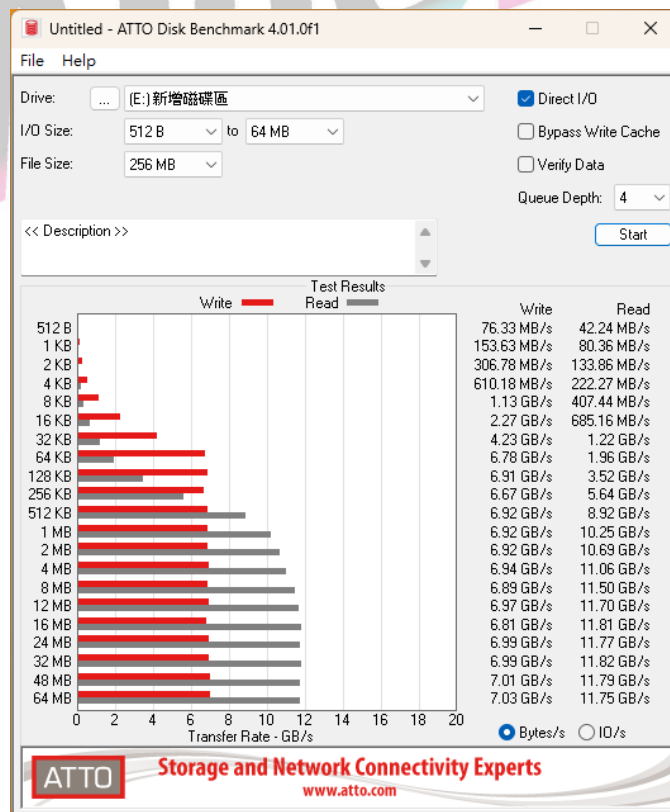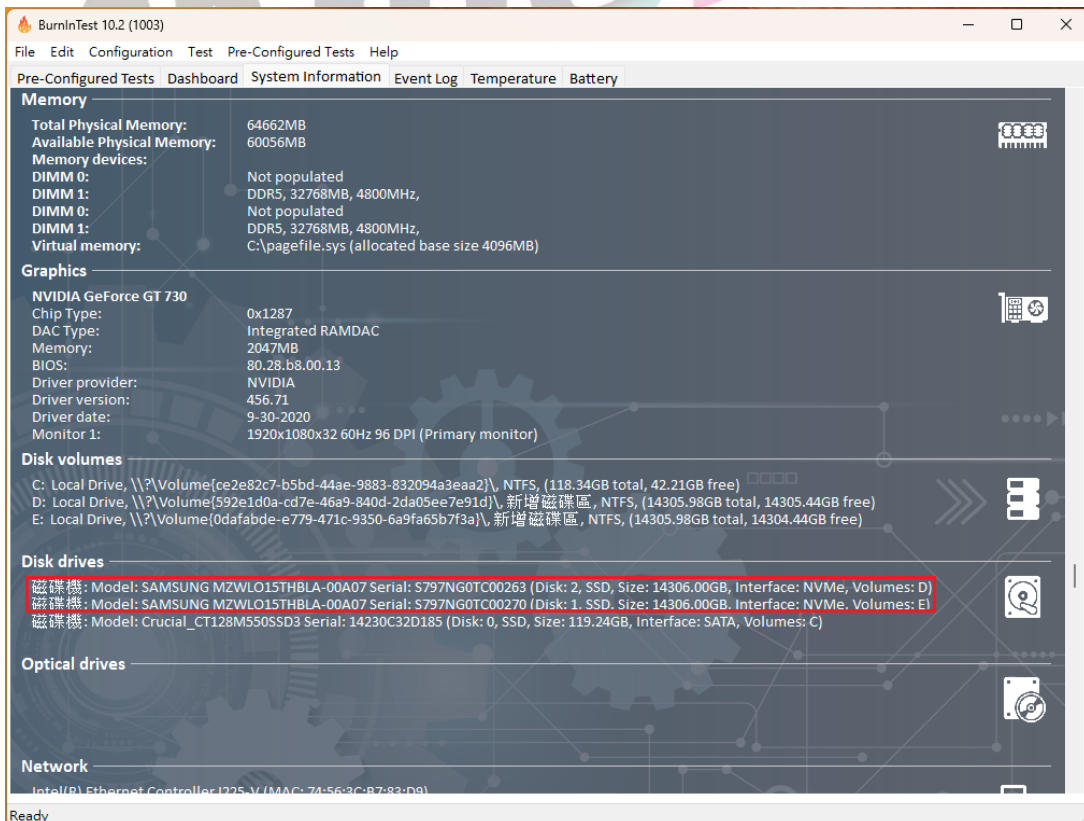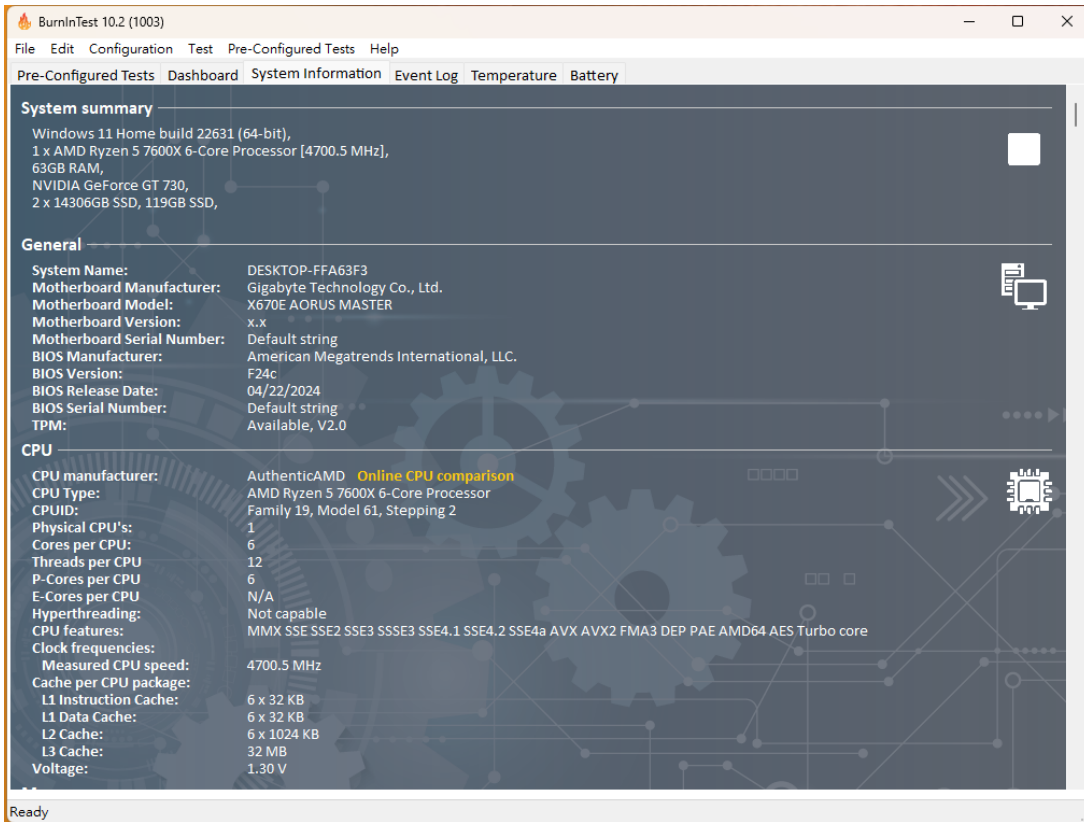| Write	Resp. time	MB written	IOPS	MB/s
Seq 4MB	0.6094ms	1,024.0	1,641.03	6,564.10
4K	0.0130ms	640.0	77,202.28	301.57
4K QD4	0.0141ms	640.0	284,168.63	1,110.03
4K QD16	0.0216ms	640.0	743,044.93	2,902.52

Run 32,275.06

Run write 19,808.05

Microsoft Windows 11 家用版 64 位元 Build (22631)
X670E AORUS MASTER/F24c, AM5
AMD Ryzen 5 7600X 6-Core Processor
Memory : 64,662 MB
Professional Edition

Drives :
Notes :

SAMSUNG MZWLO15THBLA-00A07 153
Drive D: 14,306.0/14,304.4GB free (100.0%)
NTFS - Cluster size 4096B
Storage driver **stornvme**

Alignment 16384KB OK
Compression 100% (Incompressible)

2.8.2   Samsung **U.2 PM1783 / 15.36TB SSD** performance with 100cm cable as below:

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Read	Resp. time	MB read	IOPS	MB/s
Seq 4MB	0.4883ms	2,048.0	2,048.00	8,192.00
4K	0.0776ms	629.5	12,892.25	50.36
4K QD4	0.0780ms	2,505.4	51,310.56	200.43
4K QD16	0.0830ms	9,410.4	192,723.44	752.83
32K	0.0896ms	4,000.0	11,160.52	348.77
128K	0.1099ms	16,000.0	9,101.90	1,137.74

Run read 12,342.63

Write	Resp. time	MB written	IOPS	MB/s
Seq 4MB	0.5508ms	1,024.0	1,815.60	7,262.41
4K	0.0130ms	640.0	77,129.80	301.29
4K QD4	0.0142ms	640.0	281,405.43	1,099.24
4K QD16	0.0215ms	640.0	744,356.13	2,907.64

Run 32,830.83

Run write 20,488.21

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X670E AORUS MASTER/F24c, AM5
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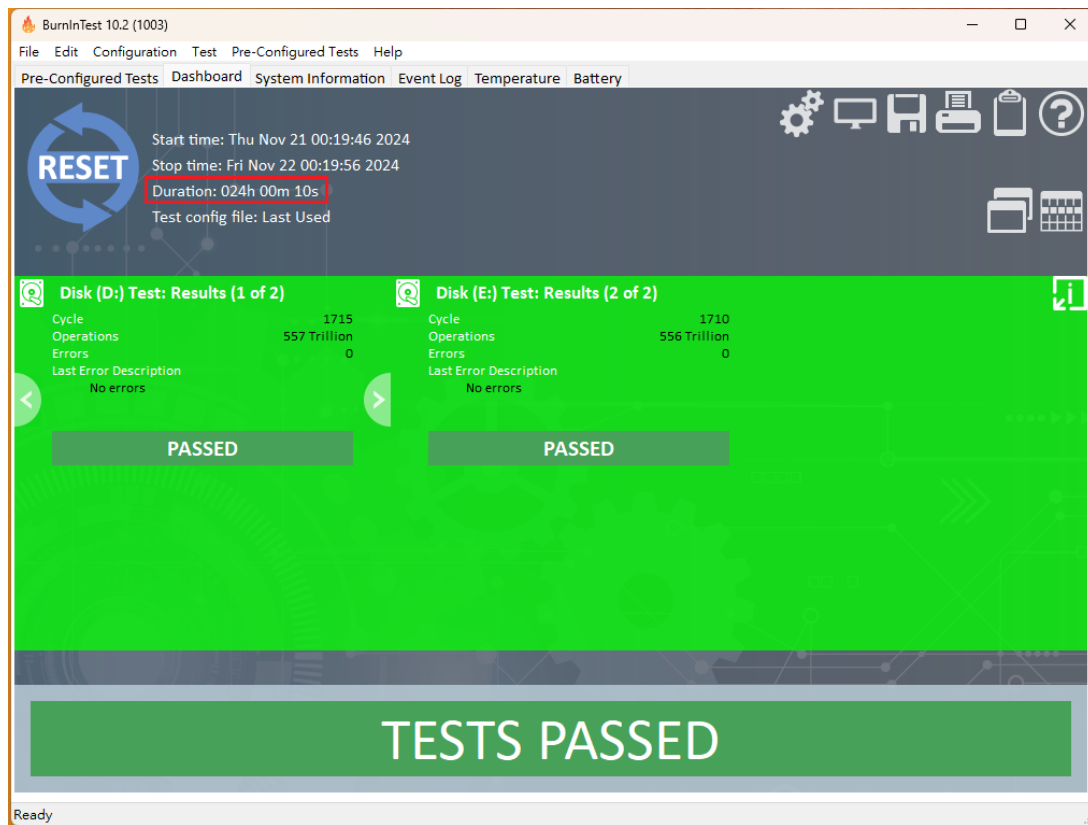
3. Burn In Tests and Results

3.1 BurnInTest v8.1 Pro

3.1.1 system information as below:

3.1.2   24-hour Burn-in test PASSED

4. Summary

4.1   EP8102 AIC is PCIe x8 Gen 5 with MCIO 38P dual port

4.2   U.2 NVMe SSD is PCIe 5.0 / 4 Lane Interface, I/O speed, max. to 128Gbps.

4.3   EP8102 AIC I/O performance is based on U.2 NVMe SSD.