



# MINERVA

## PE1604 PCIe 16 Lanes to OCulink 8i x2 Converter Card

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### Performance & Burn In Test Rev 1.0

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# PE1604 Rev1.0 PCIe x16 for SFF-8612 8i Dual ports Riser Card

## 1. Overview

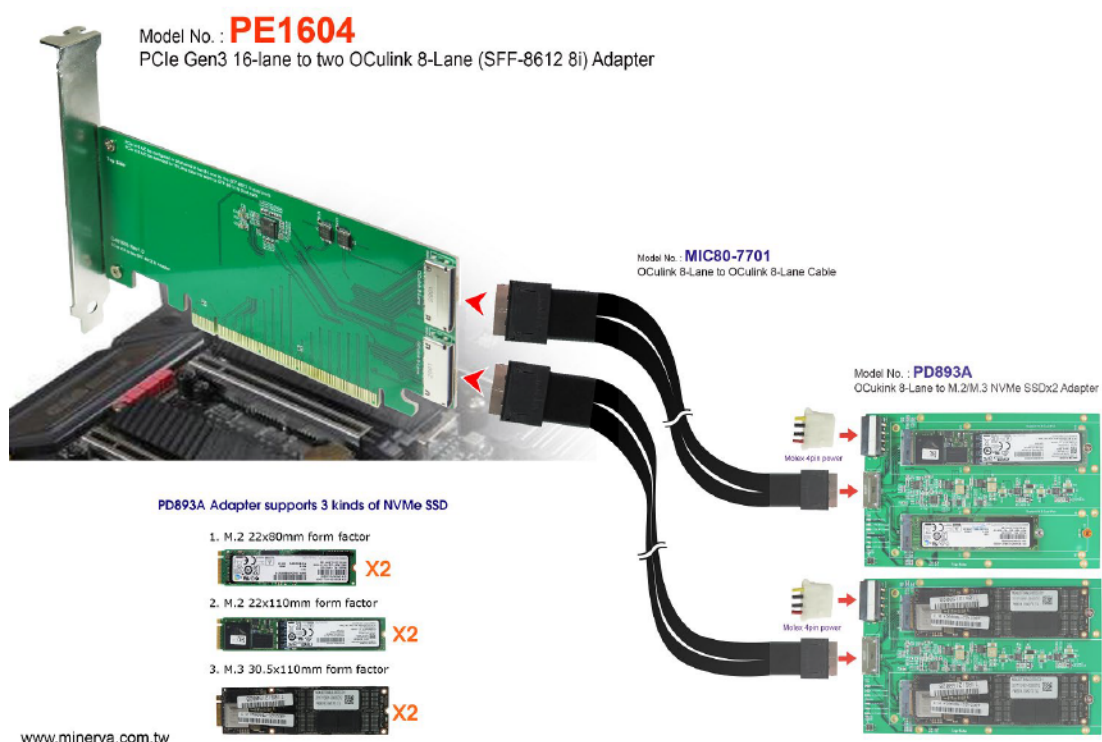
This riser card has built-in SFF-8612 8i dual ports connector. It is designed for use by PCIe x16 to configure two SFF-8612 8i bifurcations for x4 NVMe 4 ports.

## 2. Tools and Results of Performance Measurement

### 2.1 Test Platform

M/B : GIGABYTE **X570 AORUS MASTER**  
CPU : AMD **Ryzen 7, 3700X 8-Core**  
Memory : Kingston **KVR26N19D8/16, DDR4-2666MHz, 32GB**(16GB DIMM\*2)  
ATX Power : COOLER MASTER G750M, **750W ATX**, 12V V2.2 Power Supply  
AIC: PE1604 PCIe x16 to OCulink 8i dual ports ADD-in Card  
Adapter: PD893A SFF-8612 8i to M.2/M.3 dual ports Storage Adapter  
Cable: SFF-8611 8i(OCulink) to SFF-8612 8i(OCulink) Cable x2  
OS : Microsoft **Windows 10 64bit OS**

### 2.2 Test target: PE1604 AIC, PD893A adapter and M.3 NF1 & M.2 NVMe SSD



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## 2.3 Install Hardware

First inserts PE1604 AIC into GABYTE **X570 AORUS MASTER** PCIe x16 Slot and, using the MIC80-7701 Cable to connect PD893A adapter with M.3 NF1, M.2 NVMe SSD.

## 2.4 BIOS & Windows 10 OS environment setup

2.4.1 Primary SATA SSD installed Windows 10 OS.

2.4.2 M.3 NF1, M.2 NVMe SSD, formatted to NTFS Mode. Don't install any program.



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## 2.5 CrystalDiskMark 7.0 x64 performance test

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

### 2.5.1 M.2 NVMe Samsung/512GB performance as below:

CrystalDiskMark 7.0.0 x64 [ADMIN] window showing performance results for Samsung M.2 NVMe 512GB drive. The interface includes a menu bar (檔案(F), 設定(S), 設定檔(P), 佈景主題(T), 說明(H), 語言(Language)), a toolbar (All, 5, 1GiB, D: 0% (0/477GiB), MB/s), and a table of results.

	Read [MB/s]	Write [MB/s]
SEQ1M Q8T1	3561.39	1740.60
SEQ1M Q1T1	3004.09	1744.45
RND4K Q32T16	1343.60	1358.62
RND4K Q1T1	55.68	218.30

### 2.5.2 M.2 NVMe LITEON/960GB performance as below:

CrystalDiskMark 7.0.0 x64 [ADMIN] window showing performance results for LITEON M.2 NVMe 960GB drive. The interface includes a menu bar (檔案(F), 設定(S), 設定檔(P), 佈景主題(T), 說明(H), 語言(Language)), a toolbar (All, 5, 1GiB, E: 0% (0/894GiB), MB/s), and a table of results.

	Read [MB/s]	Write [MB/s]
SEQ1M Q8T1	2170.13	920.62
SEQ1M Q1T1	1841.74	894.29
RND4K Q32T16	1180.08	886.38
RND4K Q1T1	48.99	186.41

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2.5.3 **M.3 NF1 Samsung/4TB** performance as below:

Stop	Read [MB/s]	Write [MB/s]
Stop	2827.84	1961.98
Stop	2129.81	1941.94
Stop	2313.68	1638.78
Stop	47.87	200.85

2.5.4 **M.3 NF1 Samsung/4TB** performance as below:

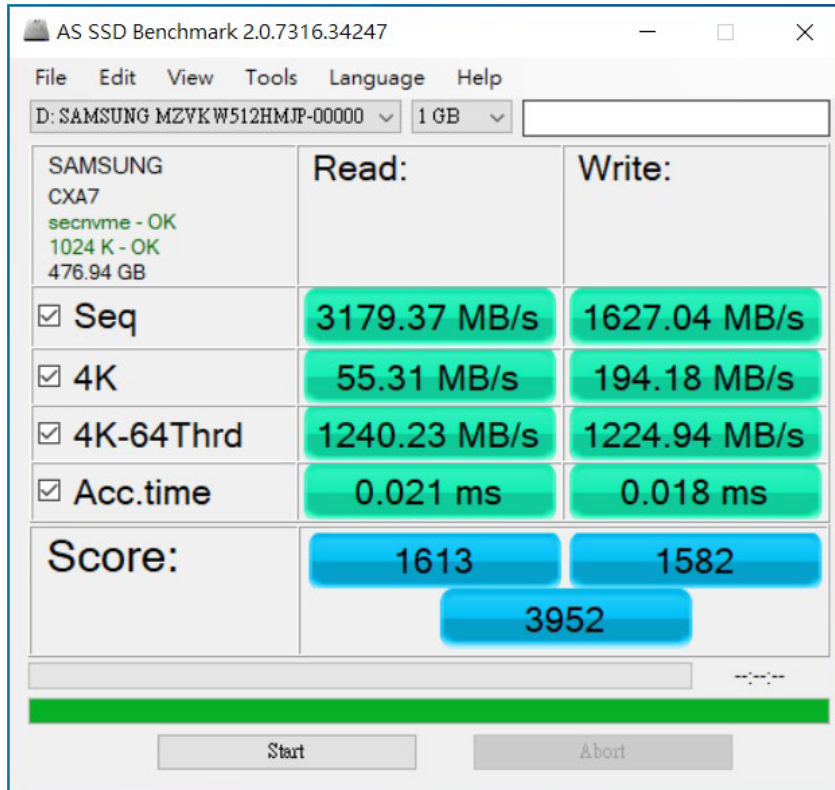
All	Read [MB/s]	Write [MB/s]
SEQ1M Q8T1	2826.43	1963.47
SEQ1M Q1T1	2121.90	1941.55
RND4K Q32T16	2314.14	1653.03
RND4K Q1T1	47.60	200.31

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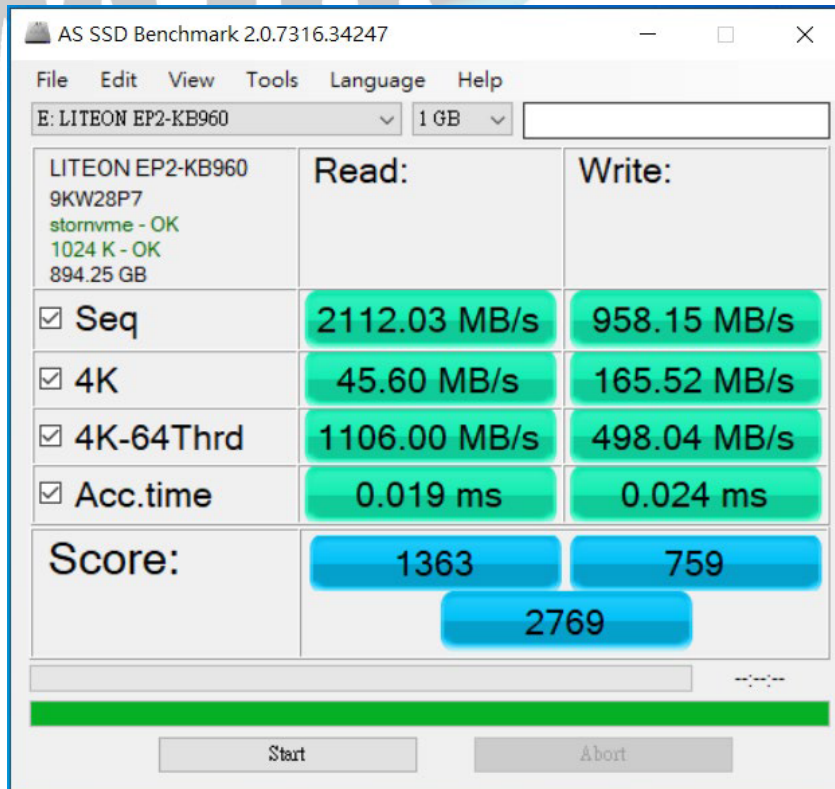
## 2.6 AS SSD Benchmark 2.0.7 performance test

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

2.6.1 M.2 NVMe Samsung/512GB performance as below:



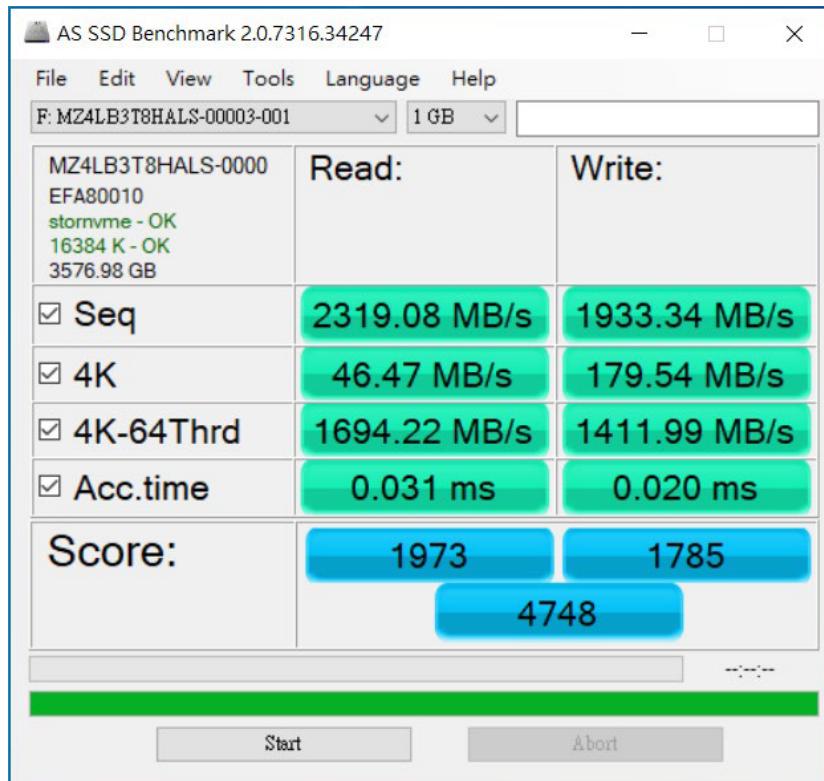
2.6.2 M.2 NVMe LITEON/960GB performance as below:



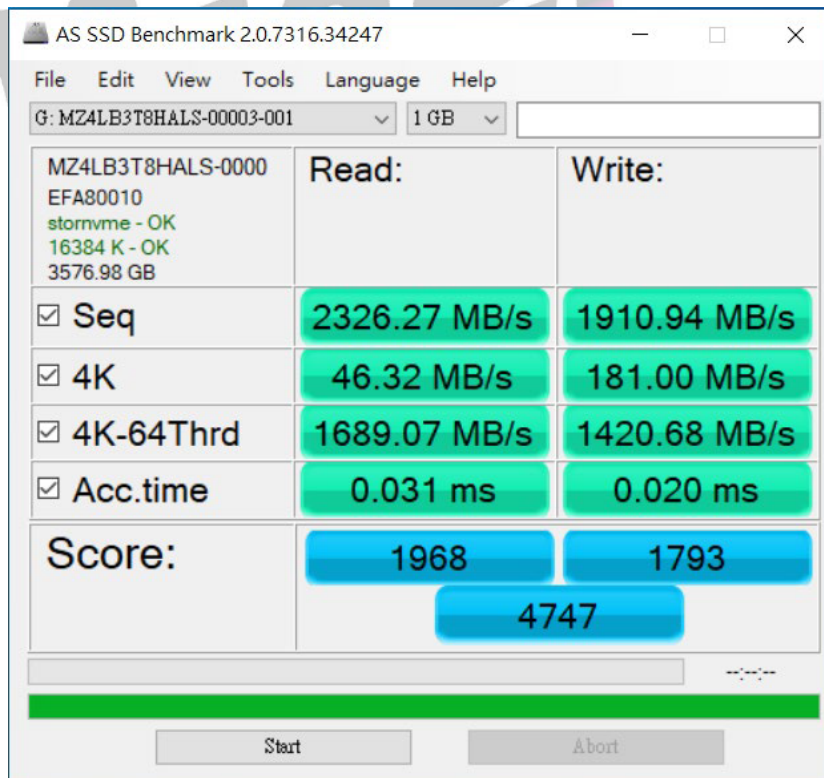


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2.6.3 **M.3 NF1 Samsung/4TGB** performance as below:



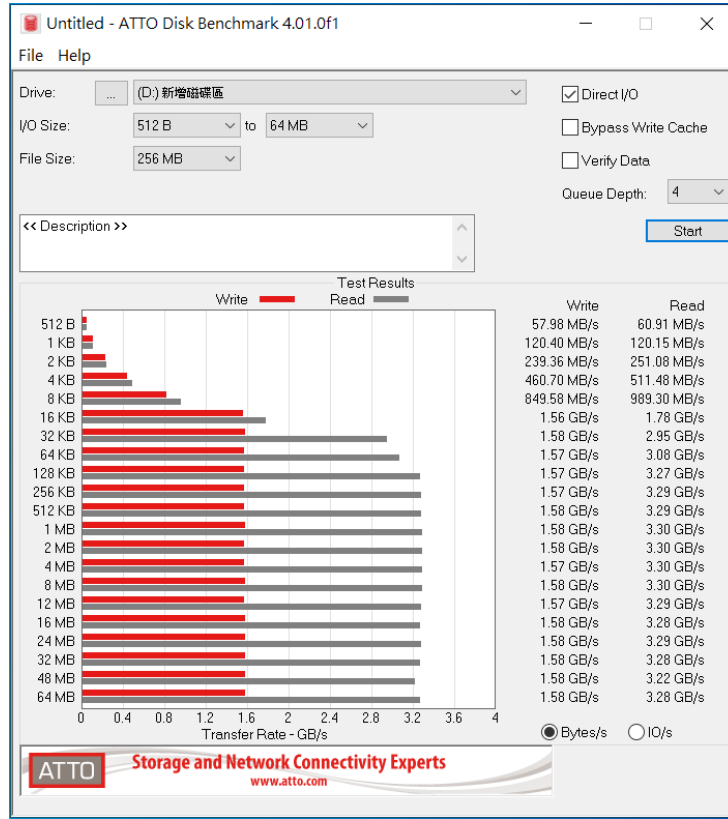
2.6.4 **M.3 NF1 Samsung/4TGB** performance as below:



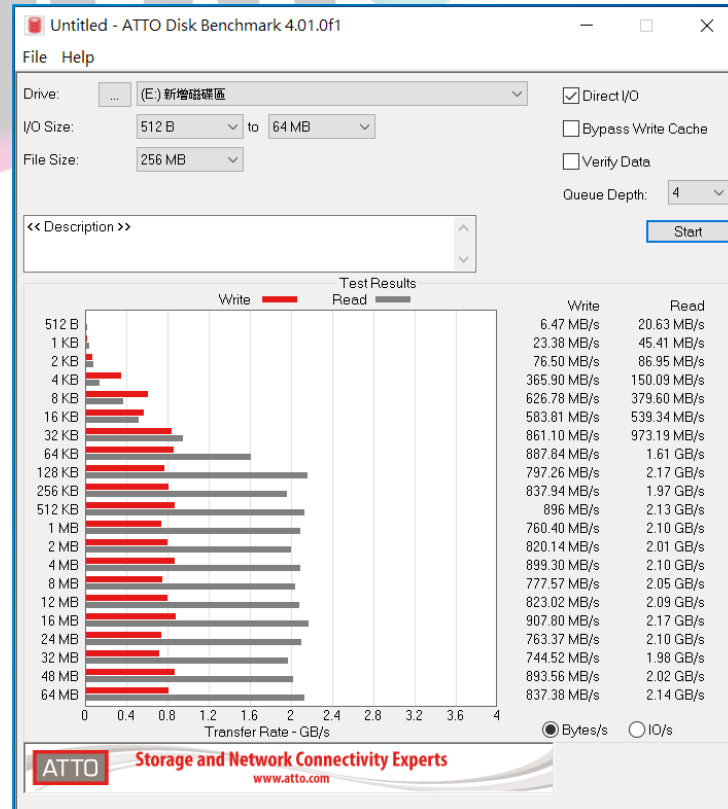
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## 2.7 ATTO Disk Benchmark 4.01. performance test

### 2.7.1 M.2 NVMe Samsung/512GB performance as below:



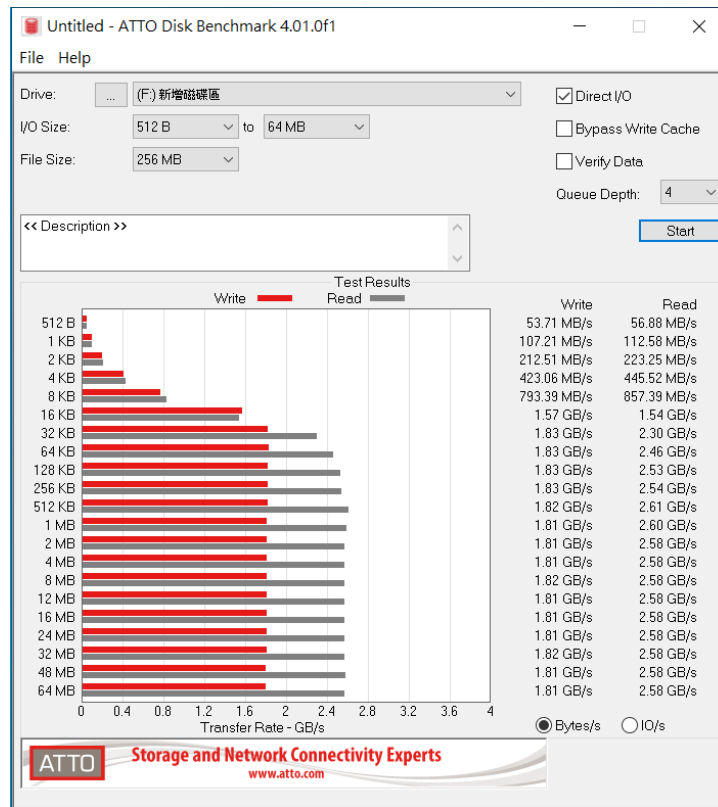
### 2.7.2 M.2 NVMe LITEON/960GB performance as below:



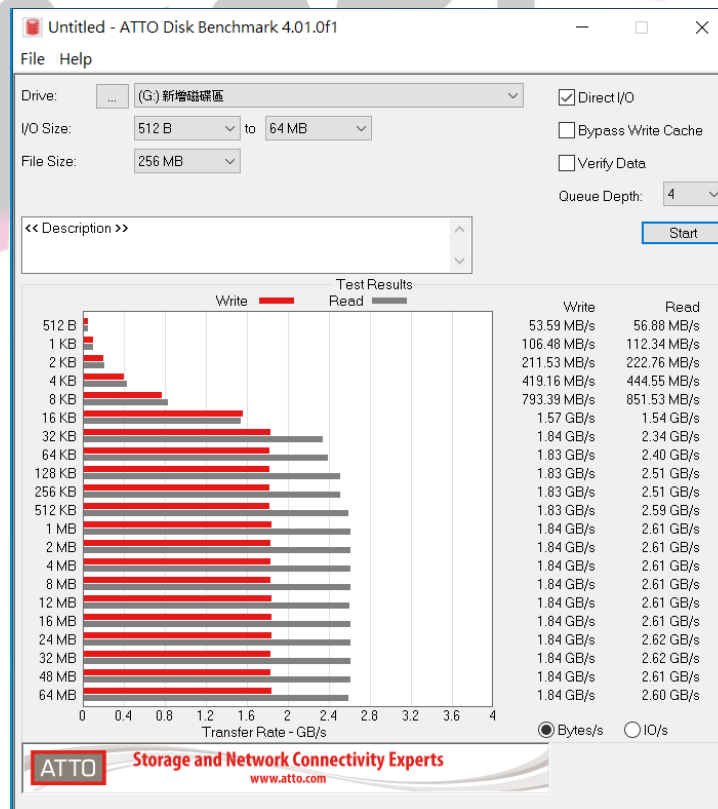


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2.7.3 **M.3 NF1 Samsung/4TGB** performance as below:



2.7.4 **M.3 NF1 Samsung/4TGB** performance as below:



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## 2.8 AnvilBenchmark\_V110\_B337

### 2.8.1 M.2 NVMe Samsung/512GB performance as below:



### 2.8.2 M.2 NVMe LITEON/960GB performance as below:



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2.8.3 **M.3 NF1 Samsung/4TGB** performance as below:



2.8.4 **M.3 NF1 Samsung/4TGB** performance as below:



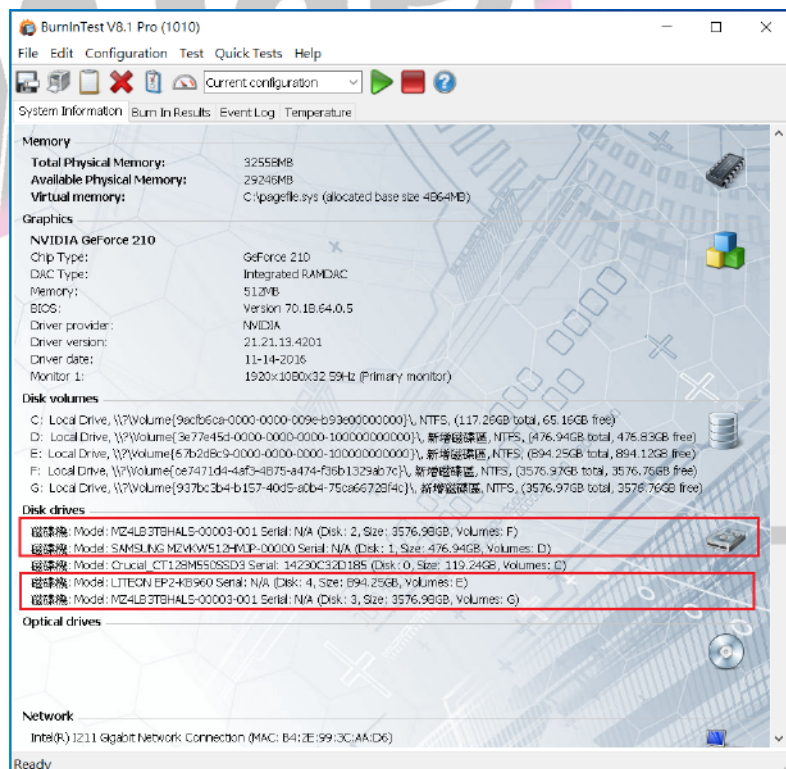
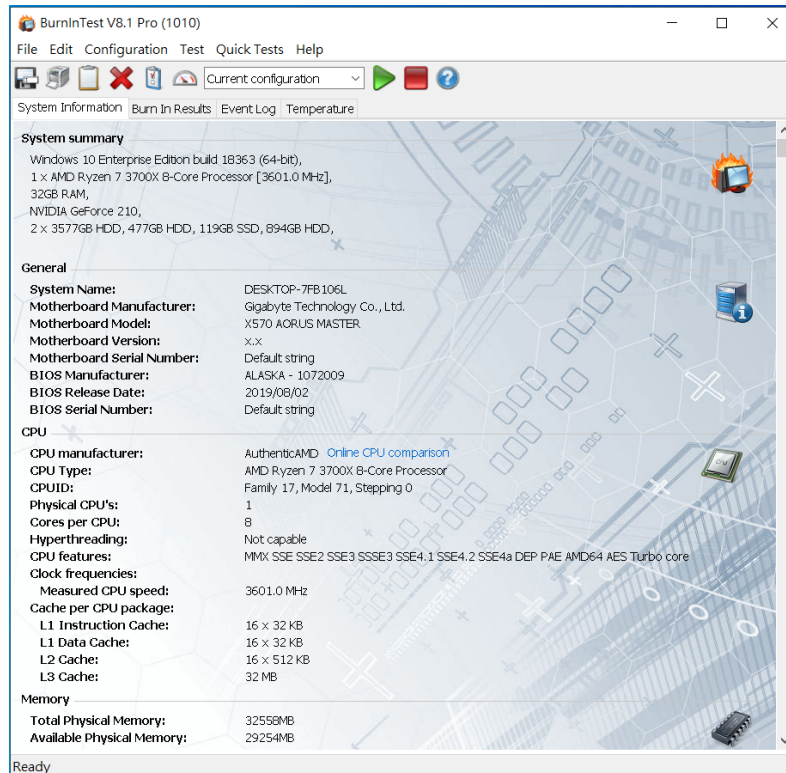


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## 3. Burn In Tests and Results

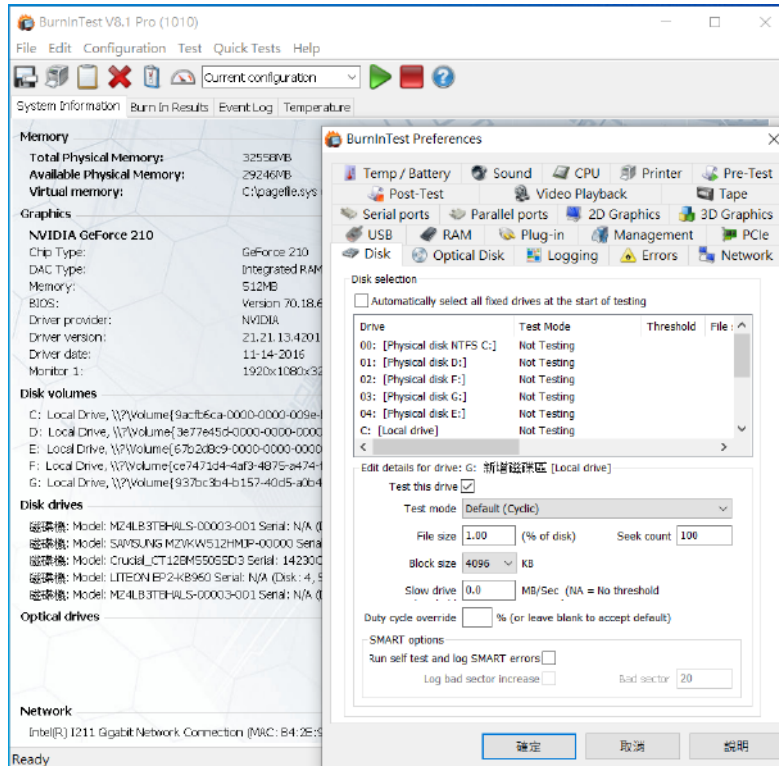
### 3.1 BurnInTest v8.1 Pro

#### 3.1.1 system information as below:

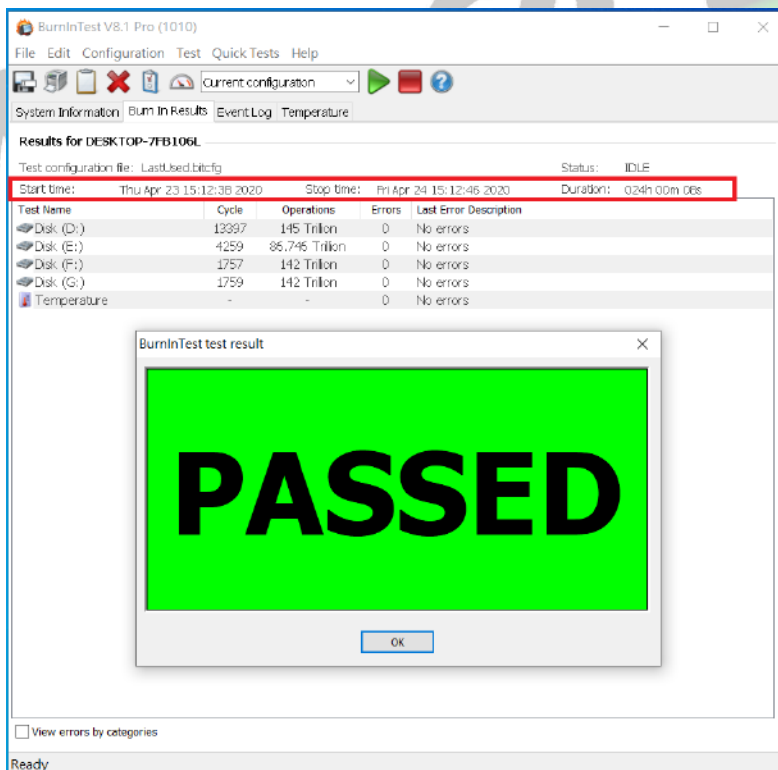


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## 3.1.2 Disk test mode( 10 ways cycle test)



## 3.1.3 24-hour Burn-in test PASSED



## 4. Summary

- 4.1 M.3 NF1, M.2 NVMe SSD is PCI-e Gen 3 / 4 Lane Interface, I/O speed, max. to 32Gbps.
- 4.2 PE1604 adapter I/O performance is based on M.3 NF1, M.2 NVMe SSD.

