



MINERVA

PU412G Converter Card

Performance & Burn In Test Rev. 1. 0

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4. Summary

PU412G Converter Card

1. Overview

PU412G adapter, providing M.2 M-key connector can be M.2 (PCI-e I/F NVMe) SSD converted into U.2(SFF-8639), PCI-e Gen 3 / 4 Lanes interface.

2. Tools and Results of Performance Measurement

2.1 Test Platform

M/B : GIGABYTE **Z170X UD5 TH**
CPU : Intel **i5-6500**, 3.2GHz/ 6M Cache/ LGA1150
Memory : Kingston **KVR21N15D8/8**, **DDR4-2133MHz**, **16G**(8GB DIMM*2)
ATX Power : COOLER MASTER G750M, **750W ATX**, 12V V2.2 Power Supply
Graphic : Z170 Chipsets built-in **HD Graphics 530**
Adapter: PE0405 PCIe to SFF-8654 Slimline Cable
Cable: Amphenol SFF-8654 Slimline SAS to U.2(SFF-8639) Cable
OS : Microsoft **Windows 10 64bit OS**

2.2 Test target: PU412G adapter & Samsung SM961 512GB NVMe SSD



PU412G Adapter



Samsung SM961 M.2 NVMe SSD

2.3 Install Hardware

Insert M.2 SSD into PU412G converter's M.2 M-key connector, and then connect PU412G converter to PE0405 adapter(PCI-e 4-lane to SFF-8643 Slimline SAS) using SFF-8654 Slimline SAS to U.2(SFF-8639), Plug PE0405 into **PCI-e slot of Z170X UD5 TH**.

2.4 BIOS & Windows 10 OS environment setup

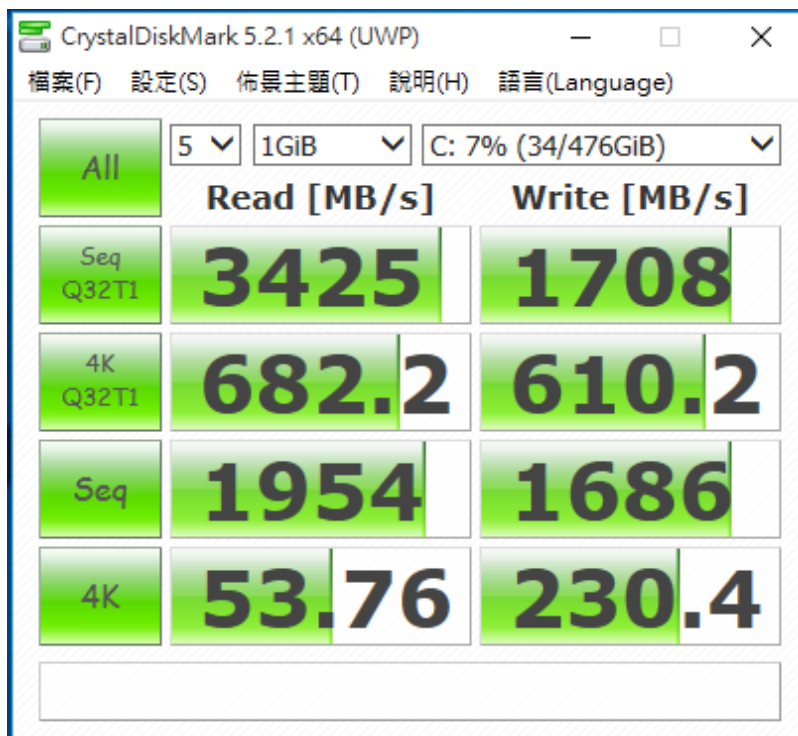
2.4.1 Install Windows 10 64bit OS into PU412G

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2.5 CrystalDiskMark 5.2.1 x64 performance test

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

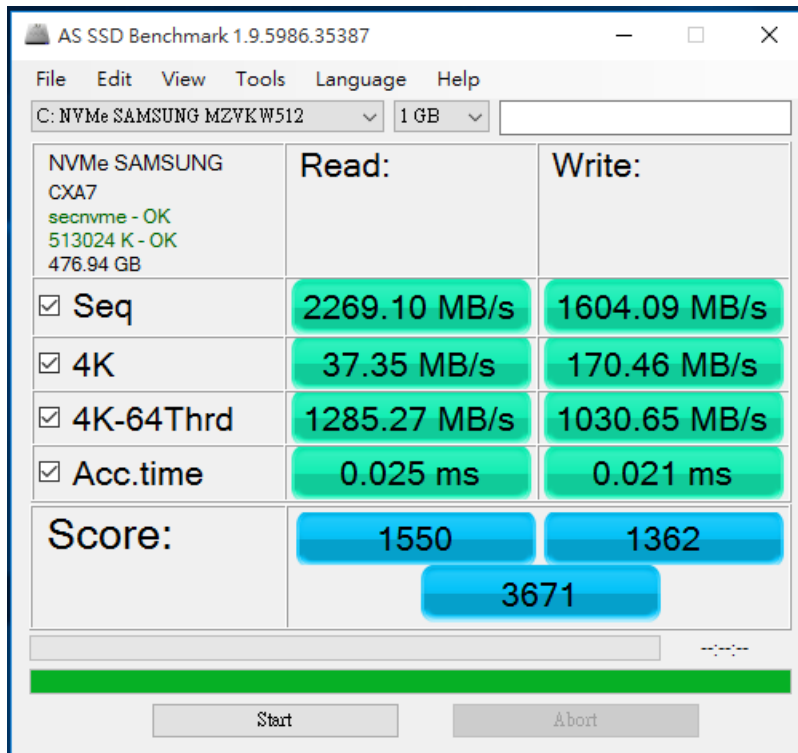
2.5.1 Show [Samsung SM961 M.2\(NVMe\)/512GB](#) performance as below:



2.6 AS SSD Benchmark 1.9 performance test

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

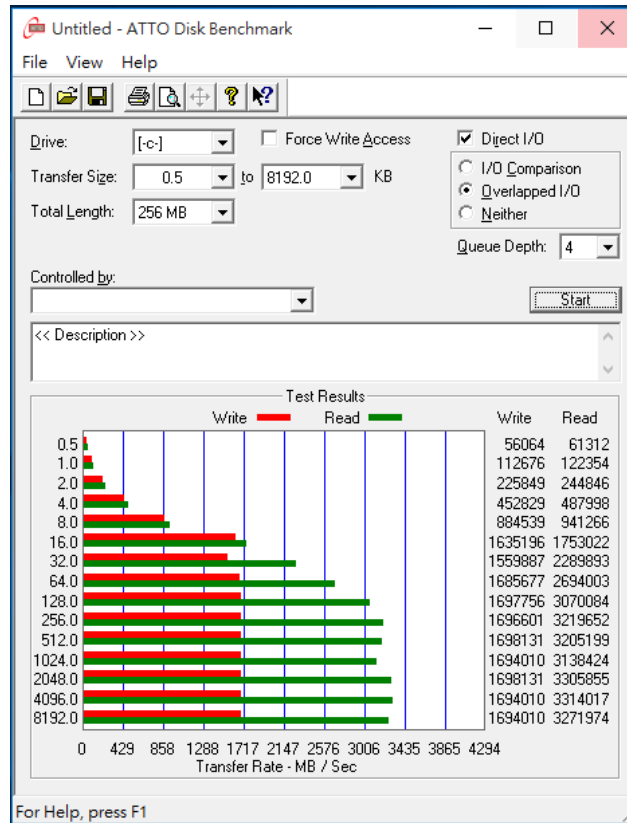
2.6.1 Show [Samsung SM961 M.2\(NVMe\)/512GB](#) performance as below:



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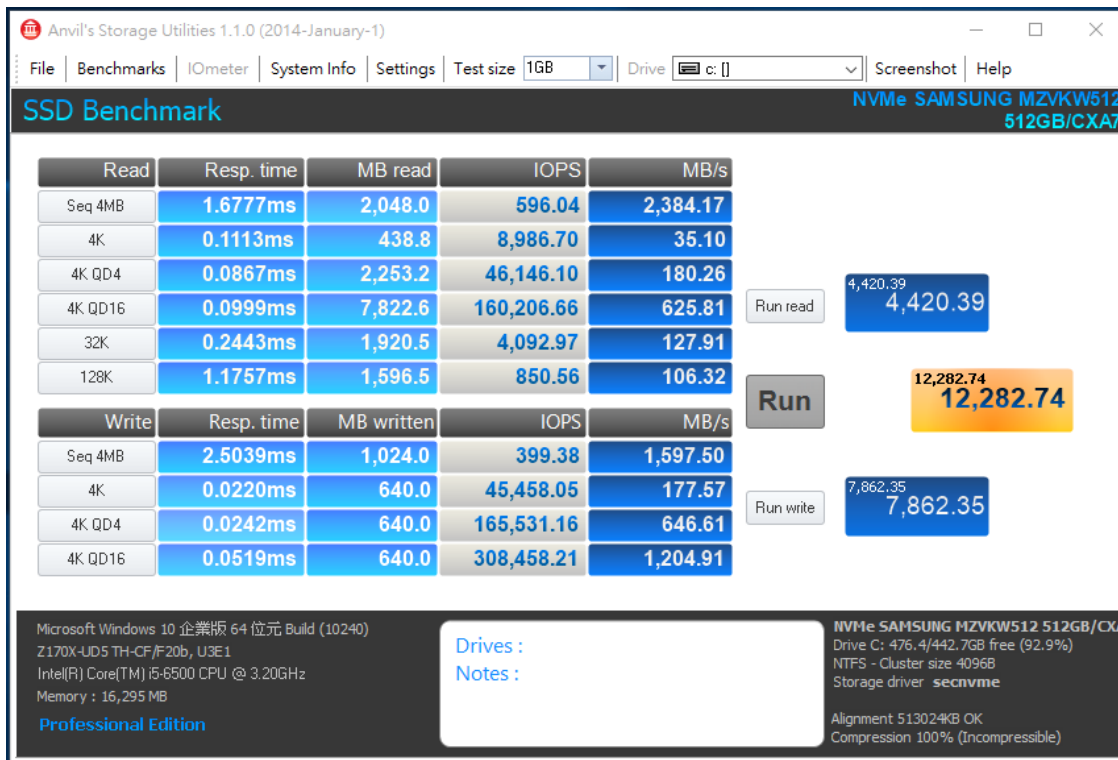
2.7 ATTO Disk Benchmark 2.47 performance test

2.7.1 Show [Samsung SM961 M.2\(NVMe\)/512GB](#) performance as below:



2.8 AnvilBenchmark_V110_B337

2.8.1 Show [Samsung SM961 M.2\(NVMe\)/512GB](#) performance as below:

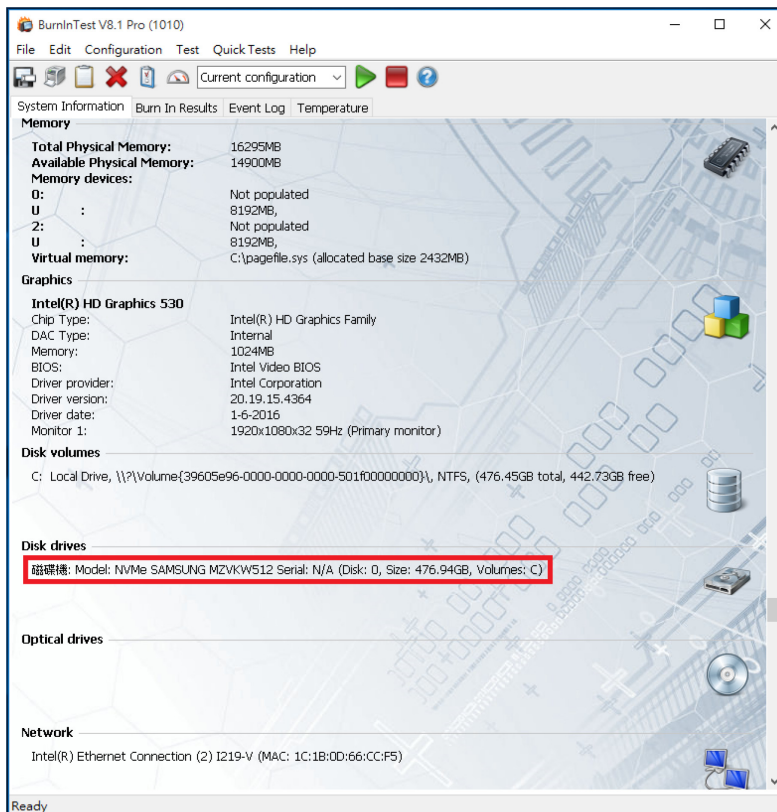
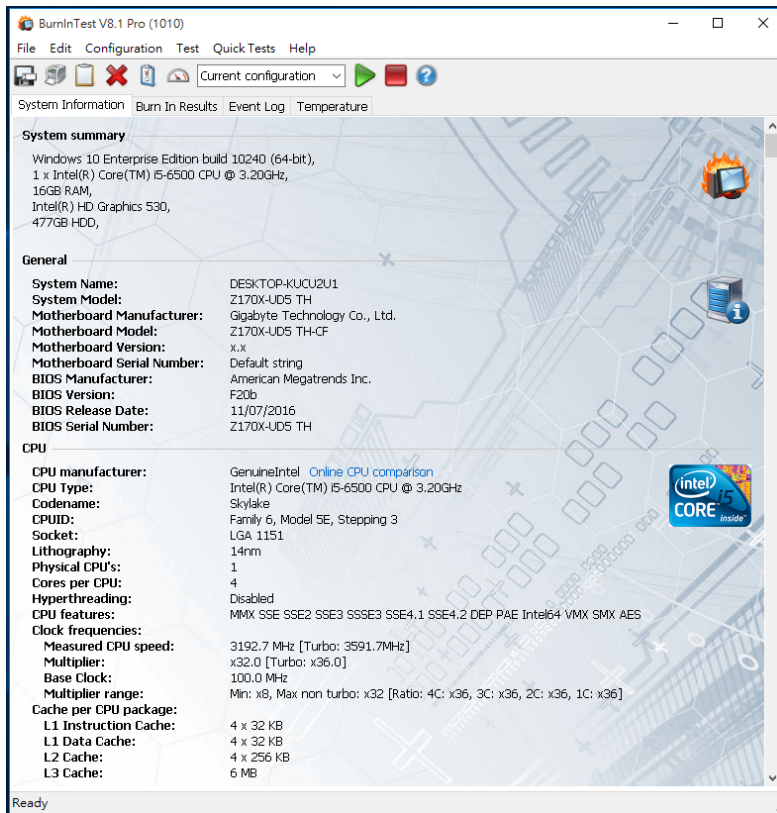


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3. Burn In Tests and Results

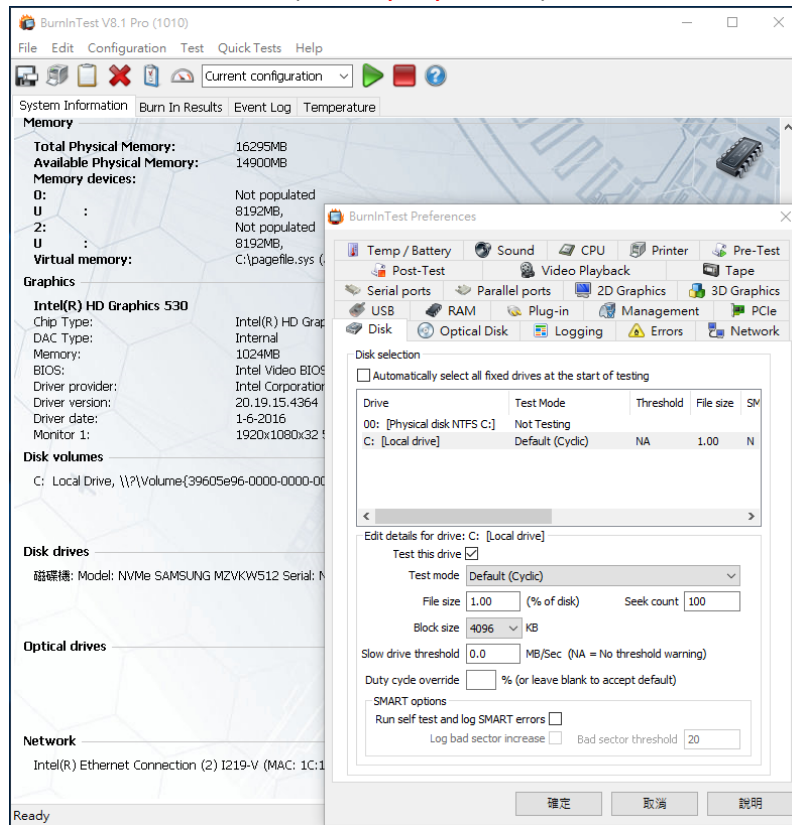
3.1 BurnInTest v8.1 Pro for [Samsung SM961 M.2\(NVMe\)/512GB](#) SSD

3.1.1 system information as below:

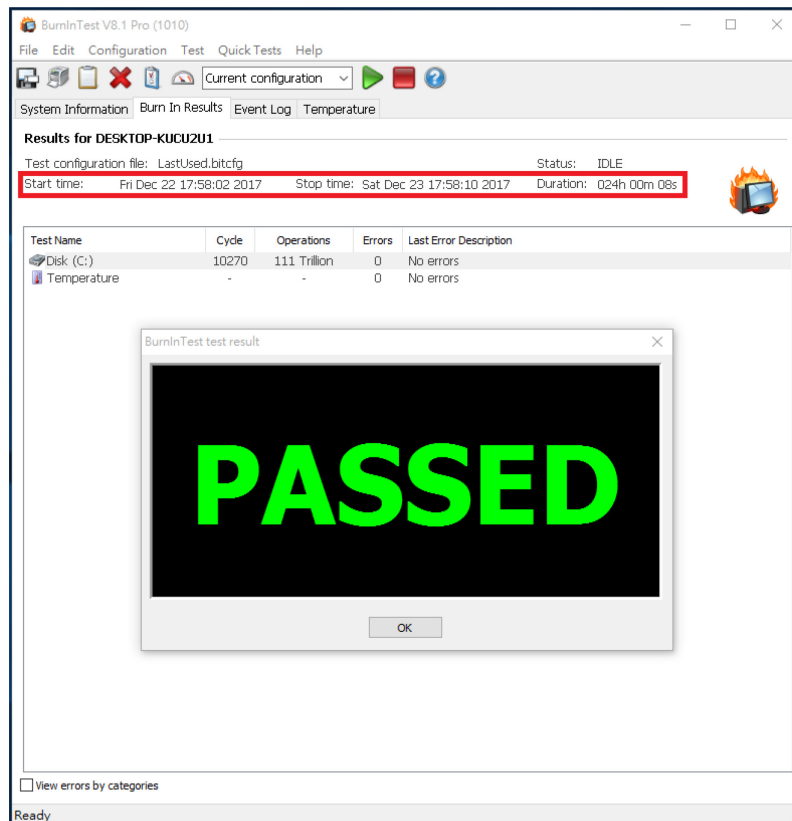


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3.1.2 show Disk test mode (10 ways cycle test)



3.1.3 show 24-hour Burn-in test PASSED



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4. Summary

- 4.1 M.2 NVMe SSD is PCI-e Gen 3 / 4 Lanes Interface, I/O speed, max. to 32Gbps.
- 4.2 PU412G adapter I/O performance is based on M.2 NVMe SSD.