MINERVA
GCE36-2001 SFF-8644 1x1,4X,200cm Cable

Performance & Burn In Test   Rev 1.0

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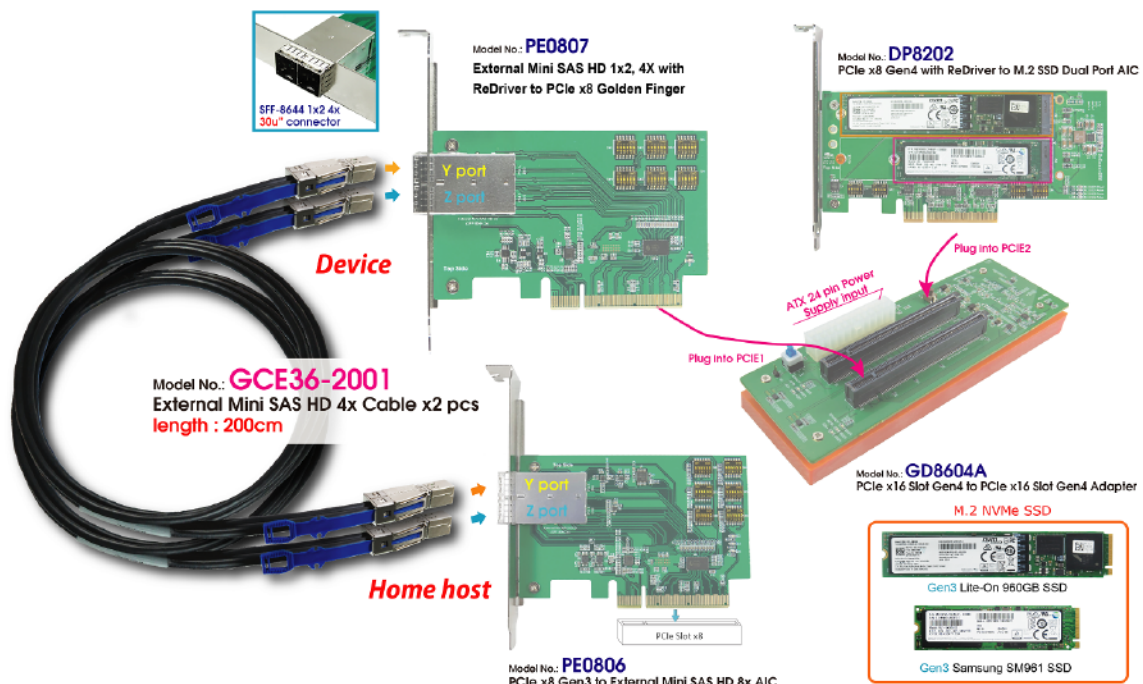# SFF-8644 1x1, 4X male to male Cable

1. Overview

This riser card has built-in external Mini SAS HD(SFF-8644) 1x2,4X connector. It is designed to for extend PCIe x8 channel reach. The ReDriver may support CTLE boosts up to **15 dB at 4 GHz.**

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
Add in Card: PE0806 PCIe x8 with ReDriver to SFF-8644 1x2, 4X AIC for Host
Add in Card: PE0807 SFF-8644 1x2, 4X with ReDriver to PCIe x8AIC for Device
Cable: PCIe Gen 3 external Mini SAS 1x1,4X, **200cm** Cable x2pcs
Adapter: GD8604A PCIe x16 Slot to PCIe x16 Slot adapter
Add in Card: DP8202 PCIe x8 to M.2 dual port
OS : Microsoft **Windows 10 64bit OS**

2.2 Test target: PE0806, PE0807,GD8604A & PE0802 with PCIe Gen M.2 NVMe SSD

2.3   Install Hardware

First inserts the M.2 SSD into the PE0802 M.2 connector, then with copper nuts, and screws to fix SSDs. (Please refer to the Installation Notes). Plugs PE0802 into GD8604A device port PCIe x16 Slot and PE0807 into GD8604A host port PCIe x16 Slot. The PE0807 connects to the PE0806 AIC card (PCIe x16 Gen 4 to SFF-8644 1x2, 4X), using the **GCE36-2001 Cable**, and Plugs PE0806 AIC into GIGABYTE **X570 AORUS MASTER**.

2.4   BIOS & Windows 10 OS environment setup

2.4.1   Primary SATA NVMe SSD install Windows 10 OS.

2.4.2   Two M.2 NVMe SSDs , formatted to NTFS Mode. Don't install any program.

2.5 <u>CrystalDiskMark 8.0.0 x64 performance test</u>

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

2.5.1 **Samsung SM961 M.2 22x80mm** /**512GB** in **Drive D:** performance as below:

CrystalDiskMark 8.0.0 x64 [Admin]	— □ ×
檔案(F)　設定(S)　設定檔(P)　佈景主題(T)　說明(H)　語言(Language)	

	5 ∨	1GiB ∨	D: 0% (0/477GiB) ∨	MB/s ∨
All		**Read (MB/s)**	**Write (MB/s)**	
SEQ1M Q8T1		3532.40	1828.89	
SEQ1M Q1T1		2996.93	1832.95	
RND4K Q32T1		561.67	537.81	
RND4K Q1T1		56.79	191.15	

2.5.2 **LITEON M.2 22x110mm** /**1TB** in **Drive E:** performance as below:

CrystalDiskMark 8.0.0 x64 [Admin]	— □ ×
檔案(F)　設定(S)　設定檔(P)　佈景主題(T)　說明(H)　語言(Language)	

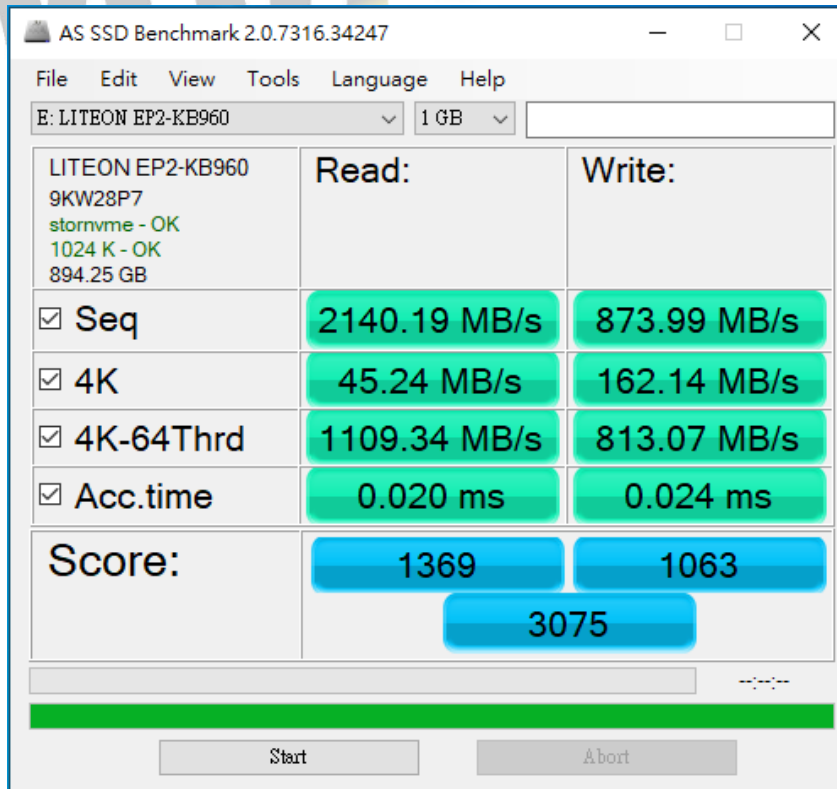|	5 ∨	1GiB ∨	E: 0% (0/894GiB) ∨	MB/s ∨
All		**Read (MB/s)**	**Write (MB/s)**	
SEQ1M Q8T1		2115.83	923.94	
SEQ1M Q1T1		1803.30	925.12	
RND4K Q32T1		529.78	506.78	
RND4K Q1T1		47.80	168.69	

2.6 AS SSD Benchmark 2.0 performance test

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

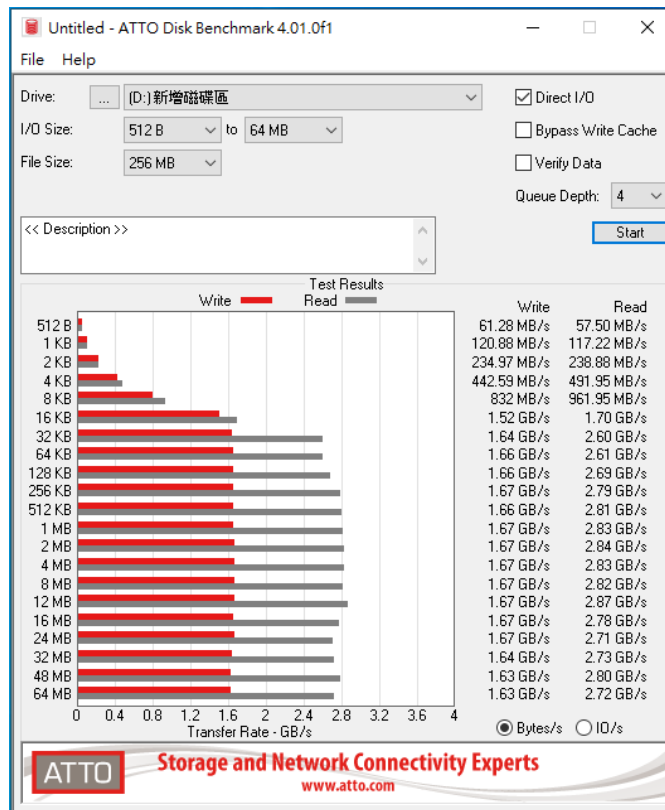2.6.1 **Samsung SM961 M.2 22x80mm /512GB** in **Drive D:** performance as below:

```
AS SSD Benchmark 2.0.7316.34247                    —   □   ×

File   Edit   View   Tools   Language   Help

D: SAMSUNG MZVKW512HMJP-00000      ▼    1 GB   ▼

SAMSUNG              Read:              Write:
CXA7
secnvme - OK
1024 K - OK
476.94 GB

☑ Seq         3097.40 MB/s        1768.70 MB/s

☑ 4K           53.04 MB/s          166.30 MB/s

☑ 4K-64Thrd   1214.16 MB/s        1164.57 MB/s

☑ Acc.time     0.022 ms            0.020 ms

Score:          1577               1508
                      3833

                  Start                Abort
```

2.6.2 **LITEON M.2 22x110mm /1TB** in **Drive E:** performance as below:

```
AS SSD Benchmark 2.0.7316.34247                    —   □   ×

File   Edit   View   Tools   Language   Help

E: LITEON EP2-KB960                ▼    1 GB   ▼

LITEON EP2-KB960     Read:              Write:
9KW28P7
stornvme - OK
1024 K - OK
894.25 GB

☑ Seq         2140.19 MB/s         873.99 MB/s

☑ 4K           45.24 MB/s          162.14 MB/s

☑ 4K-64Thrd   1109.34 MB/s         813.07 MB/s

☑ Acc.time     0.020 ms            0.024 ms

Score:          1369               1063
                      3075

                  Start                Abort
```

2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1 <u>Samsung SM961</u> **M.2 22x80mm** /**512GB** in **Drive D:** performance as below:

2.7.2 **LITEON M.2 22x110mm** /**1TB** in **Drive E:** performance as below:

2.8 AnvilBenchmark_V110_B337

2.8.1 **Samsung SM961 M.2 22x80mm /512GB** in **Drive D:** performance as below:

2.8.2 **LITEON M.2 22x110mm /1TB** in **Drive E:** performance as below:
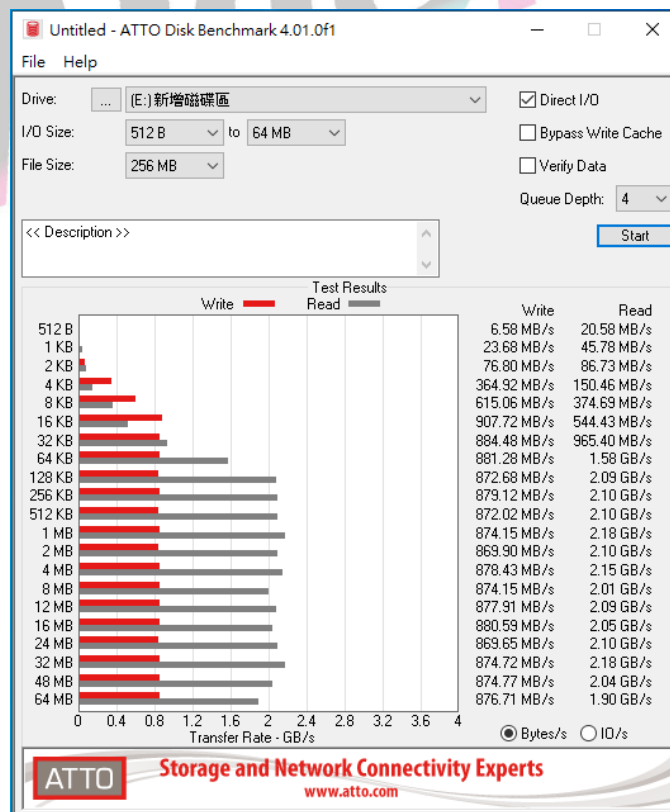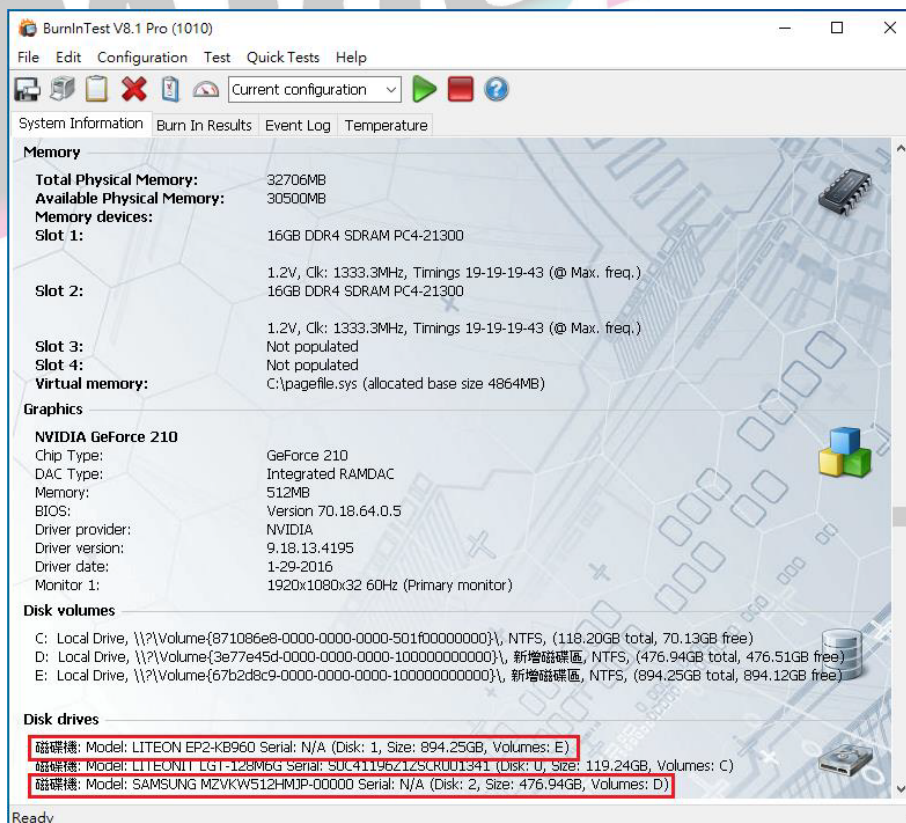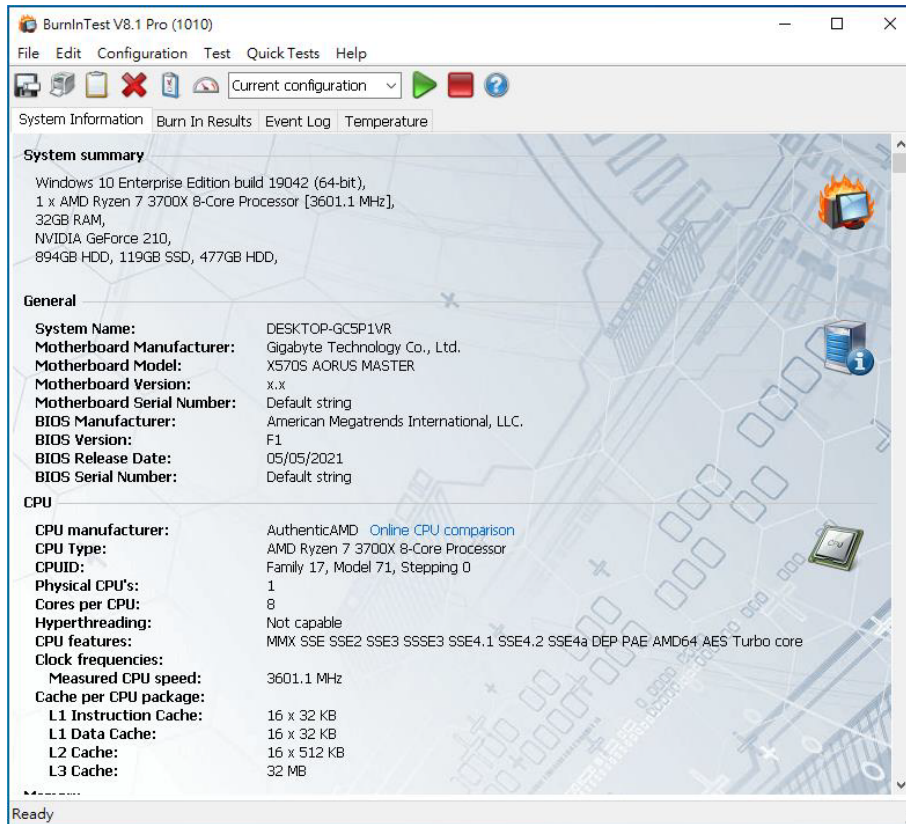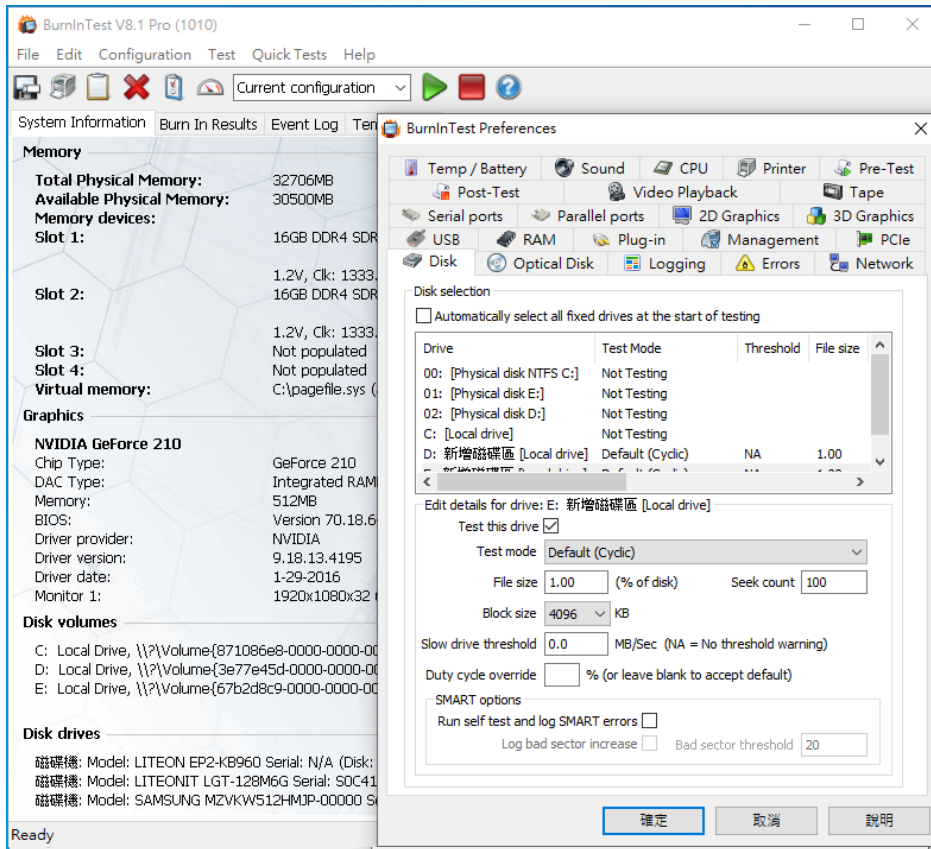
SFF-8644 1x1, 4X male to male Cable

3. Burn In

3.1 BurnInTest v8.1 Pro

3.1.1 **system information** as below:

3.1.2 Disk test mode(10 ways cycle test)

3.1.3 24-hour Burn-in test PASSED
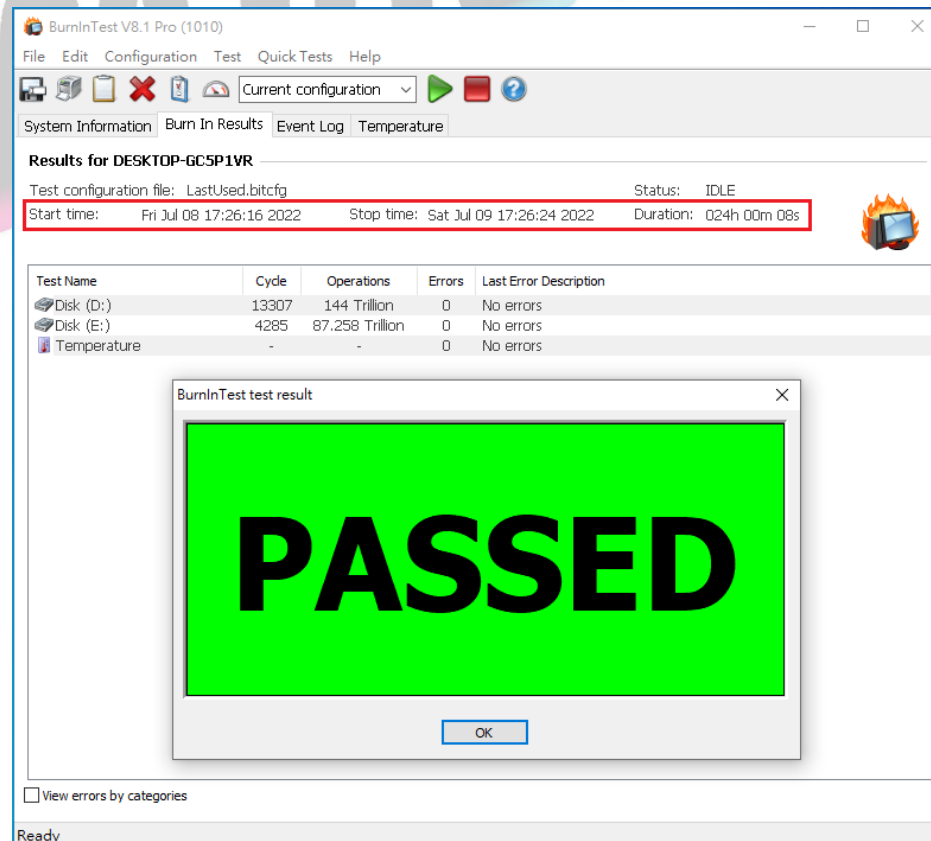
4. Summary

4.1　M.2 NVMe SSD is PCIe Gen 3 / 4 Lane Interface, I/O speed, max. to32Gbps.

4.2　PE0807 AIC I/O performance is based on NVMe SSD.