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### 1. Overview

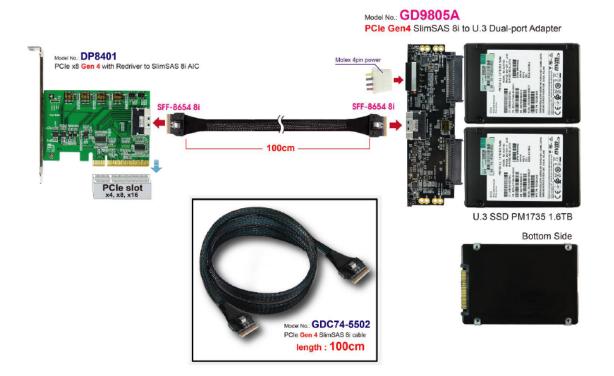
This adapter has built-in SlimSAS(SFF-8654) 8i connector and U.3 connector dual port which can be inserted into two U.2 NVMe SSDs. It is designed for use by supporting PCIe Gen 4 x8, x16 bifurcation AIC and SFF-9402 pinout PCIe Switch RAID Card.

### 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, <b>750W ATX</b> , 12V V2.2 Power Supply
Add in Card:	DP8401 PCIe x8 to SlimSAS(SFF-8654) 8i AIC
Cable:	PCIe Gen 4 SlimSAS(SFF-8654) 8i Maleto Male, 100cm Cable
Adapter:	GD9805A SlimSAS(SFF-8654) 8i to U.3 dual port adapter
OS :	Microsoft Windows 10 64bit OS

2.2 Test target: GD9805A & SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB x2



2.3 Install Hardware

First inserts the U.3 SSD into the GD9805A U.3 connector dual port and connect to the DP8401 AIC card (PCIe x8 Gen 4 to SFF-8654 8i) using the GDC74-5502 Cable, and Plugs DP8401 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 U.3 NVMe SSDs, formatted to NTFS Mode. Don't install any program.



#### CrystalDiskMark 8.0.0 x64 performance test

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

2.5.1 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive D: performance as below:

🔚 CrystalDis	kMark 8.0.0 x64 [Admin]		– 🗆 X
檔案(F) 設定	(S) 設定檔(P) 佈綦主題(T) 說明	(H) 語言(Language)	
All	5 ~ IGiB ~ E: 0% (0/	/1490GiB) ~ MB/s ~	R70%/W30% ~
	Read (MB/s)	Write (MB/s)	Mix (MB/s)
SEQ1M Q8T1	7456.42	2621.35	<b>3970.</b> 39
SEQ1M Q1T1	2776.80	<mark>2626</mark> .00	2246.35
RND4K Q32T1	<mark>55</mark> 3.28	<mark>50</mark> 2.66	<mark>54</mark> 2.49
RND4K Q1T1	51.64	<mark>1</mark> 86.55	64.19

#### 2.5.2 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive E: performance as below:

🔚 CrystalDis	kMark 8.0.0 x64 [Admin]		– 🗆 X
檔案(F) 設定	(S) 設定檔(P) 佈景主題(T) 說明	(H) 語言(Language)	
All	5 ~ 1GiB ~ E: 0% (0/	′1490GiB) ∽ MB/s ∽	R70%/W30%
AII	Read (MB/s)	Write (MB/s)	Mix (MB/s)
SEQ1M	7459.86	2613.57	<b>3997.</b> 45
Q8T1	7455.00	2015.57	<u>5997.</u> 45
SEQ1M	2726.67	2613.43	2208.72
Q1T1	2120.07	2013.43	2200.72
RND4K	<b>55</b> 3.10	<b>49</b> 7.76	<b>54</b> 0.78
Q32T1	<b>JJ</b> 5.10	437.70	<b>J4</b> 0.70
RND4K	50.96	186.08	65.40
Q1T1	50.90	100.00	05.40

#### 2.6 AS SSD Benchmark 2.0 performance test

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

2.6.1 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive D: performance as below:

🛎 AS SSD Benchmark 2.0.73	16.34247	- 🗆 X	
File Edit View Tools			
D: MZXL51T6HBJR-000H3	~ 1 GB ~		
MZXL51T6HBJR-000H MPK70H5Q stornyme - OK 1024 K - OK 1490.41 GB	Read:	Write:	
⊠ Seq	5099.75 MB/s	2507.84 MB/s	
⊠ 4K	49.90 MB/s	186.73 MB/s	
☑ 4K-64Thrd	2026.56 MB/s	2695.87 MB/s	
☑ Acc.time	0.026 ms	0.026 ms	
Score:	2586	3133	
	69	08	
-			
Star	t	Abort	

2.6.2 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive E: performance as below:

👗 AS SSD Benchmark 2.0.73	16.34247	- 🗆 X		
File Edit View Tools E: MZXL51T6HBJR-000H3	Language Help			
MZXL51T6HBJR-000H MPK70H5Q stornyme - OK 1024 K - OK 1490.41 GB	Read:	Write:		
⊠ Seq	5118.07 MB/s	2530.92 MB/s		
⊠ 4K	49.74 MB/s	184.51 MB/s		
☑ 4K-64Thrd	2032.23 MB/s	2629.41 MB/s		
☑ Acc.time	0.027 ms	0.026 ms		
Score:	2594	3067		
	6853			
Star	t	Abort		

#### 2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive D: performance as below:

Untitled - ATTO Disk Benchmark 4.01.0f1	- 🗆 X
Drive: (D:) 新增磁碟區	✓ ✓ Direct I/O
1/0 Size: 512 B 🗸 to 64 MB 🗸	Bypass Write Cache
File Size: 256 MB 🗸	🗌 Verify Data
	Queue Depth: 4 🗸
<< Description >>	Start
Test Results	
Write     Read       512 B     1 KB       1 KB     4 KB       4 KB     1 KB       32 KB     1 KB       128 KB     1 KB       256 KB     1 KB       256 KB     1 KB       24 MB     1 KB       32 MB     1 KB       32 MB     1 KB       44 MB     1 KB       44 MB     1 KB	Write         Read           23.26 MB/s         30.52 MB/s           35.16 MB/s         54.44 MB/s           91.12 MB/s         117.71 MB/s           394.74 MB/s         117.71 MB/s           394.74 MB/s         117.42 MB/s           793.39 MB/s         332.84 MB/s           1.48 GB/s         591.63 MB/s           2.44 GB/s         591.63 MB/s           2.44 GB/s         2.28 GB/s           2.44 GB/s         2.82 GB/s           2.44 GB/s         3.62 GB/s           2.44 GB/s         3.62 GB/s           2.44 GB/s         6.30 GB/s           2.41 GB/s         6.30 GB/s           2.41 GB/s         6.30 GB/s           2.41 GB/s         6.30 GB/s           2.41 GB/s         6.83 GB/s           2.41 GB/s         6.83 GB/s           2.41 GB/s         6.83 GB/s           2.41 GB/s         6.83 GB/s           2.42 GB/s         6.35 GB/s           2.43 GB/s         6.84 GB/s           2.42 GB/s         6.85 GB/s           2.43 GB/s         6.84 GB/s           2.42 GB/s         6.85 GB/s           2.42 GB/s         6.84 GB/s           2.42 GB/s         6.81 GB/s </td
0 0.8 1.6 2.4 3.2 4 4.8 5.6 6.4 7.2 8 Transfer Rate - GB/s ATTO Storage and Network Connectivit www.atto.com	Bytes/s 0 10/s

#### 2.7.2 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive E: performance as below:

🔋 Untitled - /	ATTO Disk I	Benchn	nark 4.0	1.0f1			-		×
File Help									
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File Size:	256 MB	$\sim$					🗌 Verif	y Data	
							Queue I	Depth:	4 ~
<< Description >	、 、								
CC Description 2	/								Start
				Test Res					
		Write 💻	_	Read 💻	_		Write		Read
512 B							22.65 MB/s	29.35	
1 KB							30.93 MB/s	52.36	
2 KB							01.34 MB/s	115.76	
4 KB 🗖							91.81 MB/s	120.34	
8 KB						0	91.44 MB/s	309.91	
16 KB							1.46 GB/s	527.63	
32 KB 64 KB							2.41 GB/s	960.61	
128 KB							2.44 GB/s 2.43 GB/s		GB/s GB/s
256 KB		_					2.43 GB/s		GB/s
512 KB	_						2.42 GB/s		GB/s
1 MB	_						2.43 GB/s		GB/s
2 MB	_				- 1		2.43 GB/s		GB/s
4 MB							2.43 GB/s		GB/s
8 MB							2.43 GB/s	6.56	GB/s
12 MB							2.42 GB/s	6.83	GB/s
16 MB							2.44 GB/s	6.84	GB/s
24 MB		_					2.43 GB/s	6.08	GB/s
32 MB		_					2.43 GB/s	6.81	GB/s
48 MB		_	_				2.44 GB/s		GB/s
64 MB							2.43 GB/s	6.54	GB/s
0 0.8			4 4 Rate - GB	.8 5.6 /s	6.4 7.2	2 8		010/	's
ATTO	Stor	age a		work C		tivity E	xperts		

#### 2.8 AnvilBenchmark\_V110\_B337

#### 2.8.1 SAMSUNG PM1735 U.3 NVMe SSD/ 1.6TB in Drive D: performance as below:

le Benchmarks		anuary-1)				- 0
	IOmeter System	m Info Settings	Test size 1GB	🔹 Drive 🖃 d: (新	増磁碟區]	✓ Screenshot Help
SD Benchn	nark					MZXL51T6HBJR-000
						1600GB/MPK70H
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	1.0371ms	2,048.0	964.22	3,856.87		
4K	0.0759ms	643.3	13,175.29	51.47		
4K QD4	0.0800ms	2,441.6	50,004.32	195.33		7,279.33
4K QD16	0.0888ms	8,798.7	180,195.75	703.89	Run read	7,279.33
32K	0.1042ms	4,000.0	9,593.05	299.78		
128K	0.1671ms	11,233.1	5,984.62	748.08	Run	16,686.91 <b>16,686.91</b>
Write	Resp. time	MB written	IOPS	MB/s	Itan	
Seq 4MB	1.5859ms	1,024.0	630.54	2,522.17		
4K	0.0204ms	640.0	49,011.47	191.45	Run write	9,407.58 9,407.58
4K QD4	0.0287ms	640.0	139,140.80	543.52		
4K QD16	0.0418ms	640.0	383,065.87	1,496.35		
lemory: 32,712 MB			Notes :			Storage driver <b>stornvme</b> Alignment 1024KB OK Compression 100% (Incompressible)
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 Microsoft Windows 10 企業版 64 位元 Build (19042)
 MZXL51T6HBJR-000H3 1600GB/MPK70

 X570 AORUS MASTER/F33, AM4
 Drives:

 AMD Ryzen 7 3700X 8-Core Processor
 Notes:

 Memory: 32,712 MB
 Storage driver stornvme

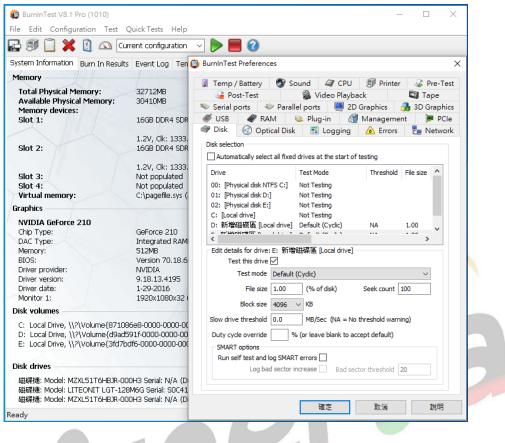
 Professional Edition
 Alignment 1024KB OK Compressible)

#### 3. Burn In Tests and Results

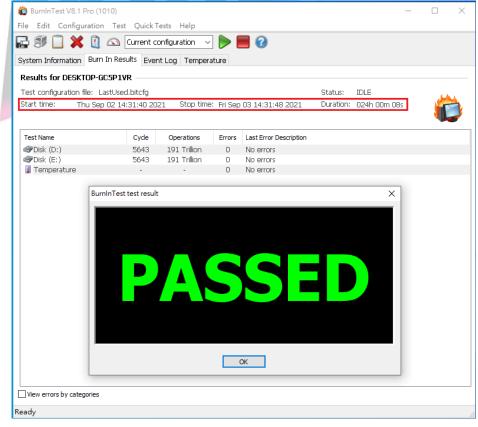
#### 3.1 BurnInTest v8.1 Pro

#### 3.1.1 system information as below: BurnInTest V8.1 Pro (1010) × File Edit Configuration Test Quick Tests Help 🔛 🗊 📋 💢 🛐 🖾 Current configuration 🖂 🍉 📕 🙆 System Information Burn In Results Event Log Temperature System summary Windows 10 Enterprise Edition build 19042 (64-bit), 1 x AMD Ryzen 7 3700X 8-Core Processor [3601.2 MHz], 32GB RAM, NVIDIA GeForce 210, 2 x 1490GB HDD, 119GB SSD, General DESKTOP-GC5P1VR System Name: Motherboard Manufacturer: Motherboard Model: Gigabyte Technology Co., Ltd. X570 AORUS MASTER Motherboard Version: Motherboard Serial Number: Default string BIOS Manufacturer: BIOS Version: American Megatrends International, LLC. F33 BIOS Release Date: BIOS Serial Number: 05/21/2021 Default string CPU CPU manufacturer: AuthenticAMD Online CPU comparison CPU Type: CPUID: AMD Ryzen 7 3700X 8-Core Processor Family 17, Model 71, Stepping 0 Physical CPU's: Cores per CPU: Hyperthreading: CPU features: Not capable MMX SSE SSE2 SSE3 SSE3 SSE4.1 SSE4.2 SSE4a DEP PAE AMD64 AES Turbo core **Clock frequencies:** Measured CPU speed: 3601.2 MHz Cache per CPU package: L1 Instruction Cache: 16 x 32 KB L1 Data Cache: 16 x 32 KB 16 x 512 KB 32 MB L2 Cache: L3 Cache: Ready BurnInTest V8.1 Pro (1010) X File Edit Configuration Test Quick Tests Help 🔛 🗊 📋 💢 🛐 🖾 Current configuration 🖂 🍉 📕 🥝 System Information Burn In Results Event Log Temperature Memory Total Physical Memory: 32712MB Available Physical Memory: Memory devices: 30410MB Slot 1: 16GB DDR4 SDRAM PC4-21300 1.2V, Clk: 1333.3MHz, Timings 19-19-19-43 (@ Max. freq.) 16GB DDR4 SDRAM PC4-21300 Slot 2: 1.2V, Clk: 1333.3MHz, Timings 19-19-19-43 (@ Max. freq.) Slot 3: Not nonulated Slot 4: Not populated C:\pagefile.sys (allocated base size 4864MB) Virtual memory: Graphics **NVIDIA GeForce 210** Chip Type: DAC Type: GeForce 210 Integrated RAMDAC Memory: 512MB Version 70.18.64.0.5 BIOS: Driver provider: NVIDIA 9.18.13.4195 Driver version: 1-29-2016 1920x1080x32 60Hz (Primary monitor) Driver date: Monitor 1: Disk volumes C: Local Drive, \\?\Volume{871086e8-0000-0000-0000-501f00000000}\, NTFS, (118.20GB total, 72.23GB free) D: Local Drive, \\?\Volume{d9ad591f-0000-0000-0000-10000000000}\,新增链碟區,NTFS, (1490.41GB total, 1490.27GB free E: Local Drive, \\?\Volume{3fd7bdf6-0000-0000-0000-10000000000}\,新增链碟區,NTFS, (1490.41GB total, 1490.27GB free) Disk drives 磁碟機: Model: MZXL51T6HBJR-000H3 Serial: N/A (Disk: 1, Size: 1490.41GB, Volumes: D) 磁碟機: Model: LITEONIT LGT-128M6G Serial: S0C41196Z1ZSCR001341 (Disk: 0, Size: 119.24GB, Volumes: C) 190.41GB, Volumes: E) 磁碟機: Moo Ready

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



#### 3.1.3 24-hour Burn-in test PASSED



#### 4. Summary

- 4.1 U.3 NVMe SSD is PCIe Gen 4 / 4 Lane Interface, I/O speed, max. to 64Gbps.
- 4.2 GD9805A adapter I/O performance is based on U.3 NVMe SSD.

