

DP8412 PCIe x8 Gen 4 with ReTimer to SlimSAS 8i A.I.C

## Performance & Burn In Test Rev 1.0

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### 1. Overview

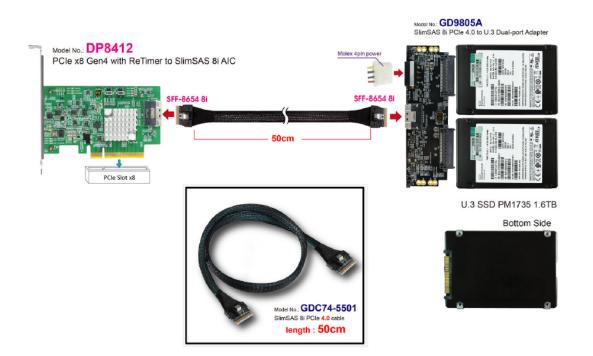
This riser card is built-in PCIe 4.0 ReTimer controller and with SlimSAS(SFF-8654) 8i connector. It is designed for use by PCIe x8 to configure two x4 bifurcations. The controller Channel insertion loss is **28 dB at 8 GHz**.

### 2. Tools and Results of Performance Measurement

2.1 Test Platform

M/B :	ASUS PRIME X570-PRO
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:	DP8412 PCIe x8 Gen4 bulit-in ReTimer to SlimSAS(SFF-8654) 8 <mark>i</mark> AlC
Cable:	PCIe Gen 4 SlimSAS(SFF-8654) 8i to SlimSAS(SFF-8654) 8i, 50cm Cable
Adapter:	GD9805A SlimSAS(SFF-8654) 8i to U.3 dual ports adapter
OS :	Microsoft Windows 10 64bit OS

2.2 Test target: DP8412, GD9805A adapter with SAMSUNG U.3 1.6TB x2pcs



#### 2.3 Install Hardware

First inserts the U.3 SSD into the GD9805A U.3 connector, then to connect the GD9805A adapter to the DP8412 AIC card (PCIe x8 Gen 4 with ReTimer to SFF-8654 8i) using the **GDC74-5501, 50cm Cable**, and Plugs DP8412 AIC into ASUS **PRIME X570-PRO**.

- 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 2.5 ※Benchmark (Sequential Read & Write / default = 1MB) 2.5.1 U.3 NVMe SAMSUNG / 1.6TB in Drive D: performance as below: 🔚 CrystalDiskMark 8.0.0 x64 [Admin]  $\times$ 檔案(F) 設定(S) 設定檔(P) 佈景主題(T) 說明(H) 語言(Language) 1GiB D: 0% (0/1490GiB) MB/s ~ 5 All Read (MB/s) Write (MB/s) SEQ1M 7451.37 **2592.18** Q8T1 SEQ1M 2819.73 2601.88 Q1T1 RND4K **551.89** 476.36 Q32T1 RND4K 194.50 53.56 01T1
  - U.3 NVMe SAMSUNG / 1.6TB in Drive E: performance as below: 2.5.2 🔚 CrystalDiskMark 8.0.0 x64 [Admin] × 設定檔(P) 佈景主題(T) 說明(H) 語言(Language) 檔案(F) 設定(S) MB/s 5 1GiB E: 0% (0/1490GiB) All Read (MB/s) Write (MB/s) SEQ1M **2591**.23 7444.26 Q8T1 SEQ1M 2818.87 2598.68 Q1T1 RND4K 549.76 475.53 Q32T1 RND4K 53.73 194.96 Q1T1

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### 2.6 AS SSD Benchmark 2.0 performance test

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

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

AS SSD Benchmark 2.0.73	- 🗆 X						
File Edit View Tools	Language Help						
D: MZXL51T6HBJR-000H3 V 1 GB V							
MZXL51T6HBJR-000H MPK70H5Q stornyme - OK 1024 K - OK 1490.41 GB	Read:	Write:					
⊠ Seq	5163.48 MB/s	2485.80 MB/s					
⊠ <b>4</b> K	50.28 MB/s	175.58 MB/s					
☑ 4K-64Thrd	2012.49 MB/s	2486.25 MB/s					
☑ Acc.time	0.027 ms	0.027 ms	B				
Score:	2579	2910					
6670							
Start Abort							

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

AS SSD Benchmark 2.0.73	16.34247	- 🗆 🗙	<	
File Edit View Tools			_	
E: MZXL51T6HBJR-000H3	~ 1 GB ~			
MZXL51T6HBJR-000H MPK70H5Q stornvme - OK 1024 K - OK 1490.41 GB	Read:	Write:		
⊠ Seq	5149.32 MB/s	2528.50 MB/s		
⊠ 4K	50.43 MB/s	176.95 MB/s		
☑ 4K-64Thrd	2012.73 MB/s	2497.75 MB/s		
☑ Acc.time	0.027 ms	0.027 ms		
Score:	2578	2928		
	66	89		
		::		
Star	t	Abort		

#### 2.7 ATTO Disk Benchamrk 4.01 performance test

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

🛢 Untitled - ATTO Disk Benchmark 4.01.0f1 File Help	– 🗆 X
Drive: (D:)新增磁碟區	V Direct I/0
1/0 Size: 512 B v to 64 MB v	Bypass Write Cache
File Size: 256 MB 🗸	🗌 Verify Data
	Queue Depth: 4 🗸
<< Description >>	Start
v .	
Test Results	
Write —— Read ——	, Write Read
512 B	23.44 MB/s 30.27 MB/s
1 KB (	33.36 MB/s 54.93 MB/s
2 KB	99.40 MB/s 119.18 MB/s
4 KB 📂	372.73 MB/s 116.73 MB/s
8 KB	750.88 MB/s 332.01 MB/s
16 KB	1.40 GB/s 578.46 MB/s
32 KB	2.42 GB/s 988.78 MB/s
64 KB	2.41 GB/s 1.62 GB/s
128 KB	2.42 GB/s 2.27 GB/s
256 KB	2.42 GB/s 2.75 GB/s
512 KB	2.41 GB/s 3.54 GB/s
1 MB	2.41 GB/s 4.73 GB/s
2 MB	2.43 GB/s 6.22 GB/s
4 MB	2.40 GB/s 6.65 GB/s
8 MB	2.41 GB/s 6.58 GB/s
12 MB	2.42 GB/s 6.75 GB/s
16 MB	2.41 GB/s 6.23 GB/s
24 MB	2.40 GB/s 6.64 GB/s
32 MB	2.41 GB/s 6.84 GB/s
48 MB	2.39 GB/s 6.75 GB/s
64 MB	2.40 GB/s 6.79 GB/s
0 0.8 1.6 2.4 3.2 4 4.8 5.6 6.4 7.2 8 Transfer Rate - GB/s	<sup>8</sup> ● Bytes/s ○ 10/s
ATTO Storage and Network Connectivit	ty Experts

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

	sk Benchmark 4.(	71.011		_	
elp					
(E:)新增	磁碟區		~	🗹 Direc	t1/0
512 B	✓ to 64 MB	$\sim$		🗌 Вура:	ss Write Cache
256 MB	~			Verify	Data
				queue D	epin. 4 🗸
ription >>			<u>_</u>		Start
		Test Results			
	Write 💻	Read 🚃		Write	Read
					30.76 MB/s
			-		54.69 MB/s
E					118.39 MB/s
					140.70 MB/s
					330.89 MB/s 582.36 MB/s
	-				991.63 MB/s
	-				1.66 GB/s
	-				2.27 GB/s
					2.84 GB/s
				2.41 GB/s	3.57 GB/s
				2.41 GB/s	4.70 GB/s
				2.42 GB/s	6.38 GB/s
					6.72 GB/s
					6.59 GB/s
					6.85 GB/s
					6.72 GB/s
					6.69 GB/s
					6.80 GB/s 6.82 GB/s
					6.85 GB/s
0.0.0.1.6	24 22 4	49 56 64		2.42 0073	0.05 GD/S
0.0 1.0			1.2 0	Bytes/s	○10/s
TO St	orage and Ne	twork Conne www.atto.com	ectivity Ex	perts	
	elp 	elp 	elp 	elp 	ielp       Image: Constraint of the second se

### 2.8 AnvilBenchmark\_V110\_B337

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

📵 Ar	wil's Storage U	tilities 1.1.0 (a	2014-Januar	y-1)				-	- 🗆	×
File	Benchmarks	IOmeter	System Info	Settings	Test size 1GB	🔹 Drive 🖃 d: 僚	「増磁碟區」	<ul> <li>✓ Screenshot</li> </ul>	Help	
SSE	) Benchn	nark						T6HBJR-		
	Read	Resp. t		MB read	IOPS	MB/s				
	Seq 4MB	1.0371	ms	2,048.0	964.22	3,856.87				
	4K	0.0764	ms	638.7	13,080.89	51.10				
	4K QD4	0.0797	ms	2,450.1	50,177.69	196.01		7,308.01		
	4K QD16	0.0881	ms	8,865.9	181,573.36	709.27	Run read	7,308.0	1	
	32K	0.1050	ms	4,000.0	9,525.94	297.69			-	
	128K	0.1640	ms 1	1,444.1	6,097.44	762.18		16,515.4	8	
	Write	Resp. t	ime M	B written	IOPS	MB/s	Run	10,	515.48	
	Seq 4MB	1.5898	ms	1,024.0	628.99	2,515.97				
	4K	0.0210	ms	640.0	47,518.10	185.62	Run write	9,207.48 <b>9,207.4</b> 8	2	
	4K QD4	0.0289	ms	640.0	138,309.28	540.27	Hun white	3,207.40		
	4K QD16	0.0434	ms	640.0	369,341.76	1,442.74				
PRIN AME	Microsoft Windows 10 企業版 64 位元 Build (19045) PRIME X570-PRO/3604, AM4 AMD Ryzen 7 3700X 8-Core Processor Memory : 32,672 MB			5)	Drives : Notes :			MZXL51T6HBJR-00 Drive D: 1,490.4/1,490 NTFS - Cluster size 409 Storage driver storm	).3GB free (10 96B	
	Professional Edition							Alignment 1024KB OK Compression 100% (In	compressible)	

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

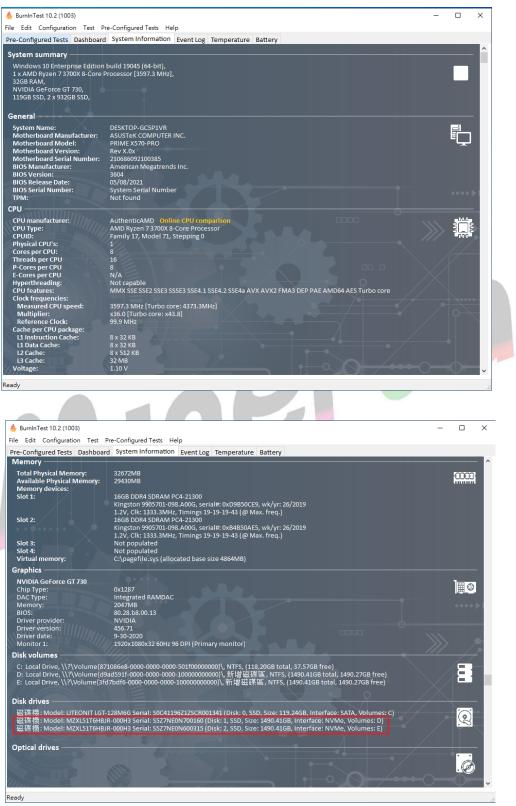
D Panaha	a mult					MZXL51T6HBJR-0
D Benchm	Idrk					1600GB/MPK7
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	1.0684ms	2,048.0	936.01	3,744.06		
4K	0.0762ms	640.6	13,119.67	51.25		
4K QD4	0.0797ms	2,450.2	50,179.95	196.02		7,187.49
4K QD16	0.0882ms	8,855.9	181,368.64	708.47	Run read	<sup>7,187,49</sup> 7,187.49
32K	0.1052ms	4,000.0	9,503.30	296.98		
128K	0.1649ms	11,381.8	6,063.80	757.97		16,486.26
Write	Resp. time	MB written	IOPS	MB/s	Run	16,486.26
Seq 4MB	1.5859ms	1,024.0	630.54	2,522.17		
4K	0.0213ms	640.0	46,878.59	183.12	Run write	<sup>9,298.77</sup> 9.298.77
4K QD4	0.0289ms	640.0	138,395.35	540.61	Hun write	3,230.11
4K QD16	0.0424ms	640.0	377,370.11	1,474.10		
crosoft Windows 10 IME X570-PRO/360	) 企業版 64 位元 Build 14 AM4	(19045)	Drives :			<b>1ZXL51T6HBJR-000H3 1600GB/</b> Drive E: 1,490.4/1,490.3GB free (100
MD Ryzen 7 3700X 8-Core Processor			Notes :			ITFS - Cluster size 4096B itorage driver <b>stornvme</b>

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### 3. Burn In Tests and Results

#### 3.1 BurnInTest v10.2 Pro

#### 3.1.1 system information as below:



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#### 3.1.2 24-hour Burn-in test PASSED

🎄 BurnInTest 10.2 (1003)				– 🗆 ×
File Edit Configuration Test	Pre-Configured Tests Hel	þ		
Pre-Configured Tests Dashboar			ry 🎝	▛ᄆ밁▤▯?
	Thu Aug 22 17:45:53 202		· · · · · · · · · · · · · · · · · · ·	
	Fri Aug 23 17:46:03 2024			
	24h 00m 10s file: Last Used			
resconing	ine. Last osed			
😟 Disk (D:) Test: Results	(1 of 2)	🧕 Disk (E:) Test: Results (	2 of 2)	
Cycle Operations	6637 225 Trillion	Cycle Operations	6634 225 Trillion	
	0		0	
Last Error Description No errors		Last Error Description No errors		
<b>S</b>	🔁			
PASSEE		PASSED	)	
	-	<b>FESTS PAS</b>		
		ESTS PA.		
non-	No. of Concession, Name			
Ready				

#### 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.