

EP8102 PCIe x8 Gen 5 with ReDriver to MCIO 38P Dual port

Performance & Burn In Test Rev 1.0

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1. Overview

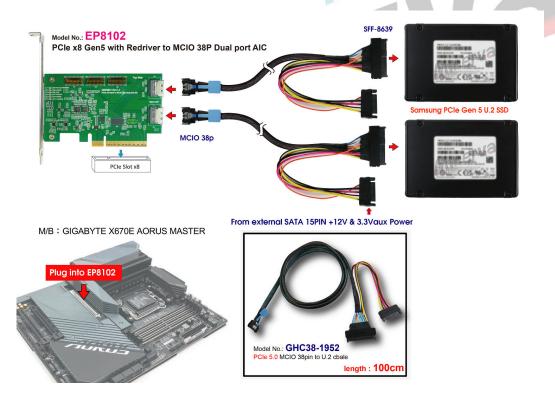
This Add-on Card is built-in MCIO 38P(SFF-TA-1016) dual port connector. It is designed for be used by PCIe x8 link width to configure two x4 bifurcations which could be extended PCIe 5.0 signals. The ReDriver on board may support CTLE to boost up to 22 dB at 16 GHz.

2. Tools and Results of Performance Measurement

2.1 Test Platform:

M/B :	GIGABYTE X670E AORUS MASTER
CPU :	AMD Ryzen 5, 7600X 6-Core
Memory :	Kingston KF556C36BBEK2, DDR5-5600MT/s, 64GB(32GB DIMM*2)
ATX Power :	Apexgaming AN-550, 550W ATX , 12V V2.2 Power Supply
AIC:	EP8102 PCIe x8 Gen 5 with Redriver to MCIO 38P dual port ADD-in Card
Cable:	PCIe 5.0 MCIO 38P to U.2(SFF-8639), 100cm Cable
OS :	Microsoft Windows 11 64bit OS

2.2 Test target: EP8102 AIC & Samsung U.2 PM1783 / 15.36TB NVMe SSD



2.3 Install Hardware

First inserts the U.2 SSD into the GHC38-1952 cable's SFF-8639 connector and connects to the EP8102 AIC card (PCIe x8 Gen 5 to MCIO 38Px2). The EP8102 AIC plugs into PCIe x16 Slot of GIGABYTE **X670E AORUS MASTER**.

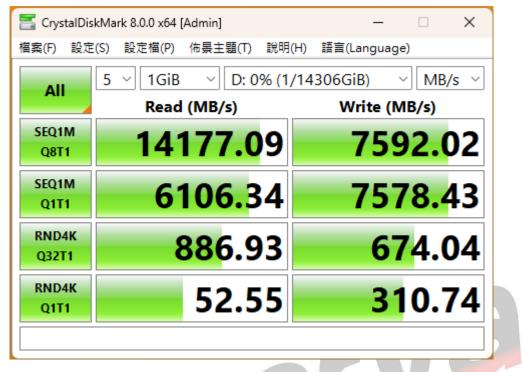
- 2.4 BIOS & Windows 10 OS environment setup
 - 2.4.1 Primary SATA NVMe SSD install Windows 10 OS.
 - 2.4.2 U.2 NVMe SSD, formatted to NTFS Mode. Don't install any program.



2.5 CrystalDiskMark 8.0.0 x64 performance test

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

2.5.1 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:



2.5.2 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

📑 Random \	🔚 Random Write (3/5) [Admin] - 🗆 🗙							
檔案(F) 設定	E(S) 設定檔(P) 佈曇主題(T) 說明	(H) 語言(Language)						
Stop		14306GiB) MB/s						
	Read (MB/s)	Write (MB/s)						
Stop	14177.5 9	7578.88						
Stop	6093.75	7569.7 2						
Stop	888.63	<mark>67</mark> 9.63						
Stop	52.59	<mark>31</mark> 0.35						

2.6 AS SSD Benchmark 2.0 performance test

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

2.6.1 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

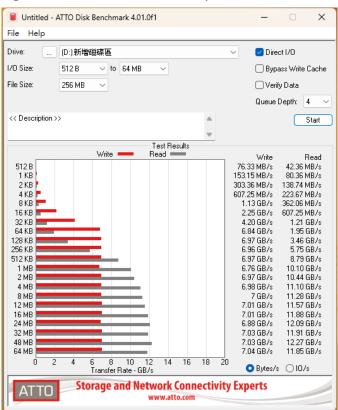
D: SAMSUNG MZWL015THBLA-00A07, V 1 GB V SAMSUNG OPPA3B5Q stornyme - OK 16384 K - OK 14306.00 GB							
2 Seq	10393.62	7207.96 MB/s					
2 4K	49.43 MB/s	282.08 MB/s					
4K-64Thrd	2838.97 MB/s	3890.95 MB/s					
Acc.time	0.022 ms	0.014 ms					
Score:	3928	4894					
10651							

2.6.2 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

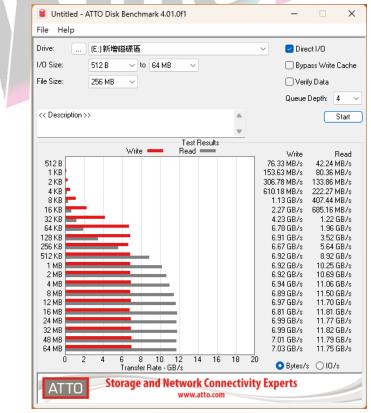
E: SAMSUNG MZWL015THBLA-00A07 V 1 GB V						
OPPA3B5Q stornyme - OK 16384 K - OK 14306.00 GB	Read:	Write:				
Seq	10342.39	7121.34 MB/s				
☑ 4K	49.57 MB/s	279.89 MB/s				
4K-64Thrd	2848.16 MB/s	3897.52 MB/s				
Acc.time	0.023 ms	0.014 ms				
Score:	3932	4890				
10651						
	1	;;				

2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:



2.7.2 Samsung U.2 PM1783 / 15.36TB SSD with 100cm cable as below:



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2.8 AnvilBenchmark_V110_B337

2.8.1	Samsung U.2 PM1783	15.36TB SSD performance with 100cm cable as below:

혠 Anvil's Storage U	Itilities 1.1.0 (2014-Jan	uary-1)				- 0 X
File Benchmarks	IOmeter System	n Info Settings	Test size 1GB	🔹 Drive 🖃 d: 僚	増磁碟區]	 ✓ Screenshot Help
SSD Benchr	mark				SAN	ISUNG MZWLO15THBLA-00A0 15360GB/OPPA3B5
			1000			
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	0.4883ms	2,048.0	2,048.00	8,192.00		
4K	0.0776ms	629.2	12,886.76	50.34		
4K QD4	0.0780ms	2,503.9	51,279.67	200.31		12,467.02
4K QD16	0.0830ms	9,407.8	192,670.59	752.62	Run read	12,467.02
32K	0.0823ms	4,000.0	12,154.59	379.83		
128K	0.1041ms	16,000.0	9,603.84	1,200.48		32,275.06
Write	Resp. time	MB written	IOPS	MB/s	Run	32,275.06
Seq 4MB	0.6094ms	1,024.0	1,641.03	6,564.10		
4K	0.0130ms	640.0	77,202.28	301.57		19,808.05 19,808.05
4K QD4	0.0141ms	640.0	284,168.63	1,110.03	Run write	19,808.05
4K QD16	0.0216ms	640.0	743,044.93	2,902.52		
	11家用版 64 位元 Build	(22631)	Duitana			SAMSUNG MZWL015THBLA-00A07 15
X670E AORUS MAST AMD Ryzen 5 7600			Drives : Notes :			Drive D: 14,306.0/14,304.4GB free (100.0 NTFS - Cluster size 4096B
Memory : 64,662 MB			NULES .			Storage driver stornvme
Professional Ed						Alignment 16384KB OK Compression 100% (Incompressible)

2.8.2 Samsung U.2 PM1783 / 15.36TB SSD performance with 100cm cable as below:

le Benchmarks	IOmeter Syste	m Info Settings	Test size 1GB	▼ Drive 🖃 e: 篩	-	Screenshot Help
SD Benchn	nark				SAN	ISUNG MZWLO15THBLA-00, 15360GB/OPPA3E
Read	Resp. time	MB read	IOPS	MB/s		
Seq 4MB	0.4883ms	2,048.0	2,048.00	8,192.00		
4K	0.0776ms	629.5	12,892.25	50.36		
4K QD4	0.0780ms	2,505.4	51,310.56	200.43		12,342.63
4K QD16	0.0830ms	9,410.4	192,723.44	752.83	Run read	^{12,342.63} 12,342.63
32K	0.0896ms	4,000.0	11,160.52	348.77		
128K	0.1099ms	16,000.0	9,101.90	1,137.74	Dum	32,830.83 32,830.83
Write	Resp. time	MB written	IOPS	MB/s	Run	32,030.03
Seq 4MB	0.5508ms	1,024.0	1,815.60	7,262.41		
4K	0.0130ms	640.0	77,129.80	301.29	Run write	20,488.21 20,488.21
4K QD4	0.0142ms	640.0	281,405.43	1,099.24	Trantwike	20,400.21
4K QD16	0.0215ms	640.0	744,356.13	2,907.64		
Microsoft Windows 11 家用版 64 位元 Build (22631) X670E AORUS MASTER/F24c, AM5						SAMSUNG MZWL015THBLA-00A07
AMD Ryzen 5 7600X			Notes :			NTFS - Cluster size 4096B Storage driver stornvme
4emory : 64,662 MB P rofessional Edi						Alignment 16384KB OK

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3. Burn In Tests and Results

3.1 BurnInTest v8.1 Pro

3.1.1 system information as below:

🍐 BurnInTest 10.2 (1003)		-	×
File Edit Configuration Test Pr	re-Configured Tests Help		
System summary Windows 11 Home build 22631 1 x AMD Ryzen 5 7600X 6-Core F 63GB RAM, NVIDIA GeForce GT 730, 2 x 14306GB SSD, 119GB SSD,			1
General System Name: Motherboard Manufacturer: Motherboard Wodel: Motherboard Version: BIOS Manufacturer: BIOS Manufacturer: BIOS Version: BIOS Release Date: BIOS Serial Number: TPM:	DESKTOP-FFA63F3 Gigabyte Technology Co., Ltd. X670E AORUS MASTER x.x Default string American Megatrends International, LLC. F24c 04/22/2024 Default string Available, V2.0		
CPU CPU manufacturer: CPU Type: CPUID: Physical CPU's: Cores per CPU: Threads per CPU P-Cores per CPU E-Cores per CPU Hyperthreading: CPU features: Clock frequencies: Measured CPU speed: Cache per CPU package: L1 Instruction Cache: L1 Data Cache:	AuthenticAMD Online CPU comparison AMD Ryzen 5 7600X 6-Core Processor Family 19, Model 61, Stepping 2 1 6 12 6 N/A Not capable MMX SSE SSE2 SSE3 SSSE3 SSE4.1 SSE4.2 SSE4a AVX AVX2 FMA3 DEP PAE AMD64 AES Turbo core 4700.5 MHz 6 x 32 KB 6 x 32 KB		
Li Data Lache: L2 Cache: L3 Cache: Voltage: Ready	6 X 32 X B 6 X 1024 KB 32 MB 1.30 V		
🍐 BurnInTest 10.2 (1003)		-	×
File Edit Configuration Test Pr			
Pre-Configured Tests Dashboard Memory	System Information Event Log Temperature Battery		



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BurninText 102 (103) I de Edit Configured Texts Help Pre-Configured Texts Deshboard System Information Event Log Temperature Battery Start time: Thu Nov 21 00:19:46 2024 Stop time: Fri Nov 22 00:19:56 2024 Duration: 024h 00m 105 Test config file: Last Used Orde 1725 Cycle 7120 Operations 557 Trillion Restrop PASSED PASSED PASSED PASSED PASSED TESTS PASSED Disk (E) Test: Results (1 of 2) Cycle 7120 Operations 557 Trillion Restrict Description No errors PASSED PASSED PASSED PASSED PASSED	3.1.2	24-hour Burn-in te	est PASSED			
Pre-Configured Tests Dashboard System Information Event Log Temperature Battery Start time: Thu Nov 21 00:19:46 2024 Stop time: Fri Nov 22 00:19:56 2024 Duration: 022h 00m 105 Test config file: Last Used Objections Event Stop Trillion Event Stop Trillion	🍐 BurnInTest 10.2 (1003)				– 🗆 X
Start time: Thu Nov 21 00:19:46 2024 Stop time: Fri Nov 22 00:19:56 2024 Duration: 024h 00m 105 Test config file: Last Used Cole Operations Cole Operations For Description No errors PASSED PASSED PASSED PASSED PASSED PASSED PASSED	File Edit Configu	uration Test Pre-Configured Tests He	łp			
Stot time: Fill Nov 22 00:19:56 2024 Duration: C24h 00m 10s Test config file: Last Used Image: Config file: Last Used Orde 1715 Orde 1715 Operations 557 Trillion Image: Config file: Last Used Operations PASSED PASSED PASSED PASSED PASSED PASSED	Pre-Configured Te	ests Dashboard System Information	Event Log Temperature B	attery		
Duration: 024h 00m 10s Test config file: Last Used Disk (D:) Test: Results (1 of 2) Overations Overations Soft From Description No errors PASSED PASSED PASSED PASSED PASSED PASSED	DECET				₡₽₽	≞ [] ?
Test config file: Last Used Image: Disk (D:) Test: Results (1 of 2) Optice 1710 Operations 557 Trillion Foros 0 Use from Description 0 No errors 0 PASSED PASSED PASSED PASSED Test Config file: Last Used 0 End of the security of the securet of the security of the security of the security of	RESET					
Cycle 1715 Operations 557 Trillion Profise 0 Isst Error Description No errors 0 PASSED PASSED PASSED TESTS PASSED		Test config file: Last Used				
Cycle 1715 Operations 557 Trillion Profise 0 Isst Error Description No errors 0 PASSED PASSED PASSED TESTS PASSED	Disk (D:) T	est: Results (1 of 2)	🔘 Disk (E:) Test: Resul	lts (2 of 2)		i.
Errors Last Error Description No errors PASSED PASSED PASSED PASSED PASSED PASSED PASSED	Cycle					K:
PASSED PASSED PASSED TESTS PASSED						
PASSED PASSED TESTS PASSED						
TESTS PASSED		• 100 Barris - 100 Days	NO ETTOIS			
		PASSED	PASS	SED		
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	RIUL					
Post.			TESTS PA	ASSED		
- VERON	Ready					
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4. Summary

- 4.1 EP8102 AIC is PCIe x8 Gen 5 with MCIO 38P dual port
- 4.2 U.2 NVMe SSD is PCIe 5.0 / 4 Lane Interface, I/O speed, max. to 128Gbps.
- 4.3 EP8102 AIC I/O performance is based on U.2 NVMe SSD.