

DP9504 PCIe x4 Gen 4 with ReDriver for Gen-Z 1C AIC

ocal

Performance & Burn In Test Rev. 1.0

Table of Contents

- 1. Overview
- 2. Performance Measurement Tools and Results
 - 2.1 Test Platform
 - 2.2 Test target and U.2 NVMe SSD
 - 2.3 Install Hardware
 - 2.4 BIOS & Windows 10 OS environment setup
 - 2.5 CrystalDiskMark 8.0 x64 performance test
 - 2.6 AS SSD Benchmark 2.0.7 performance test
 - 2.7 ATTO Disk Benchamrk 4.0.1 performance test
 - 2.8 AnvilBenchmark_V110_B337 Benchmark performance test

3. Burn In Tests and Results

- 3.1 BurnInTest v8.1 Pro burn in test
- 4. Summary

1. Overview

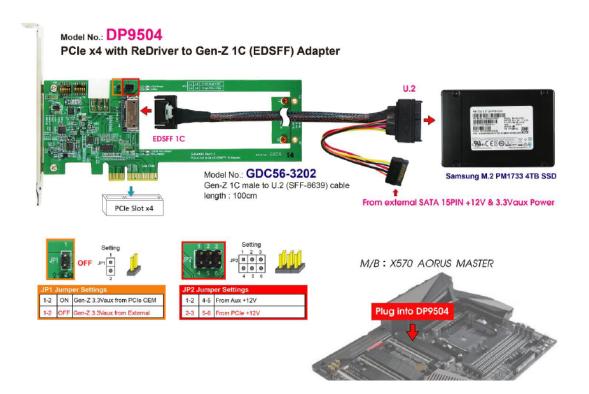
The Host Bus Adapter may provide PCIe x4 Gen4, 16GT/s high-speed signals extension with ReDriver controller to Gen-Z 1C (EDSFF).

2. Tools and Results of Performance Measurement

2.1 Test Platform:

GIGABYTE X570 AORUS MASTER
AMD Ryzen 7, 3700X 8-Core
Kingston KVR26N19D8/16, DDR4-2666MHz, 32GB(16GB DIMM*2)
COOLER MASTER G750M, 750W ATX , 12V V2.2 Power Supply
DP9504 PCIe x4 Gen 4 with Redriver to Gen-Z 1C ADD-in Card
Gen-Z 1C to U.2(SFF-8639) PCIe Gen 4, 100cm Cable
Microsoft Windows 10 64bit OS

2.2 Test target: DP9504 & Samsung U.2 PM1733 / 4TB NVMe SSD



2.3 Install Hardware

Inserts U.2 NVMe SSD into Gen-Z 1C cable, and connects cable to DP9504 AIC. The DP9504 plugs into PCIe x16 Slot of GIGABYTE X570 AORUS MASTER

2.4 BIOS & Windows 10 OS environment setup

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



2.5 CrystalDiskMark 8.0 x64 performance test

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

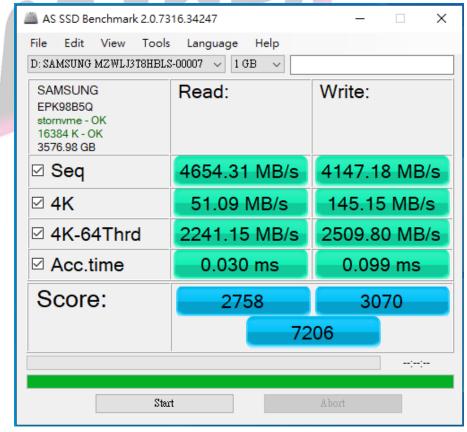
2.5.1 Samsung U.2 PM1733 / 4TB NVMe SSD performance as below:

\overline CrystalDi	skMark 8.0.0 x64 [Admin]	– 🗆 X
檔案(F) 設定	E(S) 設定檔(P) 佈景主題(T) 說明	(H) 語言(Language)
All	5 ~ 1GiB ~ D: 0% (1	/3577GiB) ~ MB/s ~
All	Read (MB/s)	Write (MB/s)
SEQ1M	7423.42	3729.67
Q8T1	7423.42	5725.07
SEQ1M	1991.76	3810.39
Q1T1	1331.70	5010.55
RND4K	52 7.61	58 7.36
Q32T1	527.01	507.50
RND4K	52.31	36.90
Q1T1	52.51	50.50

2.6 AS SSD Benchmark 2.0.7 performance test

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

2.6.1 Samsung U.2 PM1733 / 4TB NVMe SSD performance as below:



Minerva Innovation Company

2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1 Samsung U.2 PM1733 / 4TB NVMe SSD performance as below:

File Help			— - :			
Drive: (D:)新增磁碟區		\sim	🗹 Dire	ct 1/0		
/O Size: 512 B v to 64 MB	\sim		🗌 Вур	ass Write	Cache	
File Size: 256 MB 🗸 🗸			Veri	y Data		
			Queue	Depth:	4 ~	
<< Description >>	< >				Start	
	est Results					
Write R	ead 💻	_	Write	I	Read	
512 B			I4 MB/s	24.051		
1 KB			58 MB/s	46.51		
2 KB			07 MB/s	43.51 1		
4 KB 8 KB			04 MB/s 52 MB/s	121.981		
16 KB			5∠ мв/s 49 GB/s	229.91 I 531.53 I		
32 KB			43 GB/S 50 GB/S	994.091		
64 KB			58 GB/s	1.59		
128 KB			52 GB/s	2.48		
256 KB			50 GB/s	2.93		
512 KB		3.9	57 GB/s	3.15	GB/s	
1 MB			50 GB/s	4.63		
2 MB			71 GB/s	6.23		
4 MB			65 GB/s	6.76		. /
8 MB			53 GB/s	6.67		
12 MB			56 GB/s	6.621 C.751		
16 MB			57 GB/s 57 GB/s	6.75 I 6.88 I		1.1
32 MB			52 GB/s	6.921		
48 MB			56 GB/s	6.91		
64 MB			52 GB/s	6.891		
0 0.8 1.6 2.4 3.2 4 4.8 Transfer Rate - GB/s	5.6 6.4 7.2	8	Bytes/s	0107	s	
Storage and Netw	and Comments	tere Eren				

2.8 AnvilBenchmark_V110_B337

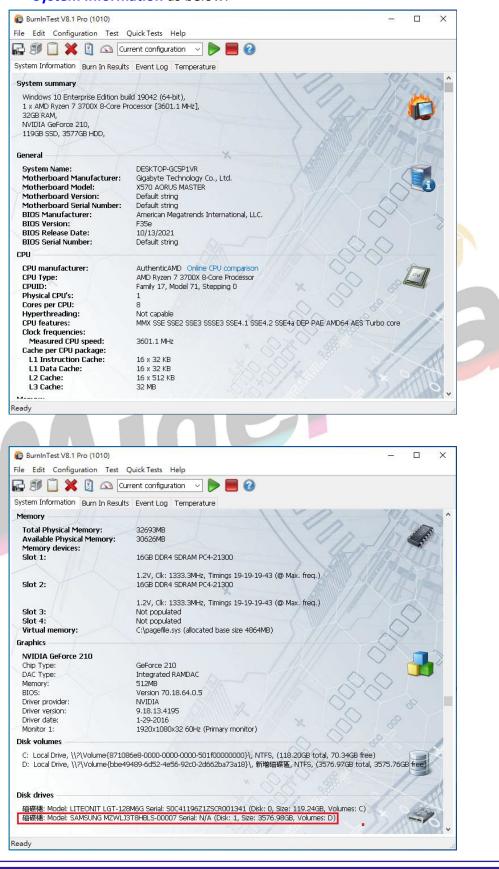
2.8.1 Samsung U.2 PM1733 / 4TB NVMe SSD performance as below:

File Benchmarks IOmeter System Info Settings Test size 1GB SSD Benchmark Read Resp. time MB read IOPS Seq 4MB 1.1289ms 2,048.0 885.81 4K 0.0747ms 654.0 13,394.29 4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 348,626.54	3,543.25 52.32 194.99 716.62 287.98 860.62 Run ^{7,147.92} 7,147.92 7,147.92 7,147.92 17,464.10 17,464.10
Seq 4MB 1.1289ms 2,048.0 885.81 4K 0.0747ms 654.0 13,394.29 4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.00 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	3840GB/EPK98 MB/s 3,543.25 52.32 194.99 716.62 Run read 7,147.92 7,147.92 287.98 860.62 Run 17,464.10
Seq 4MB 1.1289ms 2,048.0 885.81 4K 0.0747ms 654.0 13,394.29 4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	MB/s 3,543.25 52.32 194.99 716.62 287.98 860.62 Run 17,464.10 17,464.10
Seq 4MB 1.1289ms 2,048.0 885.81 4K 0.0747ms 654.0 13,394.29 4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	3,543.25 52.32 194.99 716.62 287.98 860.62 Run ^{7,147.92} 7,147.92 7,147.92 7,147.92 17,464.10 17,464.10
4K 0.0747ms 654.0 13,394.29 4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	52.32 194.99 716.62 287.98 860.62 Run 17,464.10 17,464.10
4K QD4 0.0801ms 2,437.4 49,917.31 4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	194.99 7,147.92 716.62 Run read 287.98 17,464.10 860.62 17,464.10
4K QD16 0.0872ms 8,957.8 183,455.23 32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	716.62 Run read 7,147.92 287.98 860.62 17,464.10 Run
32K 0.1085ms 4,000.0 9,215.26 128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	287.98 860.62 Run 17,464.10
128K 0.1452ms 12,922.3 6,884.98 Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	860.62 Run 17,464.10 17,464.10
Write Resp. time MB written IOPS Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	Run 17,464.10
Seq 4MB 0.9766ms 1,024.0 1,024.00 4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	MB/s Run 17,464.10
4K 0.0221ms 640.0 45,232.34 4K QD4 0.0328ms 640.0 121,852.79	
4K QD4 0.0328ms 640.0 121,852.79	4,096.00
	176.69 Run write 10,316.18
4K QD16 0.0459ms 640.0 348,626.54	475.99 Run write 10,316.18
	1,361.82
Microsoft Windows 10 企業版 64 位元 Build (19042)	SAMSUNG MZWLJ3T8HBLS-00007
X570 AORUS MASTER/F35e, AM4 Drives : AMD Rivzen 7 3700X 8-Core Processor Notes :	Drive D: 3,577.0/3,575.8GB free (100.0 NTFS - Cluster size 4096B
AMD Ryzen 7 3700X 8-Core Processor Notes : Memory : 32,693 MB	Storage driver stornvme
Professional Edition	

Minerva Innovation Company

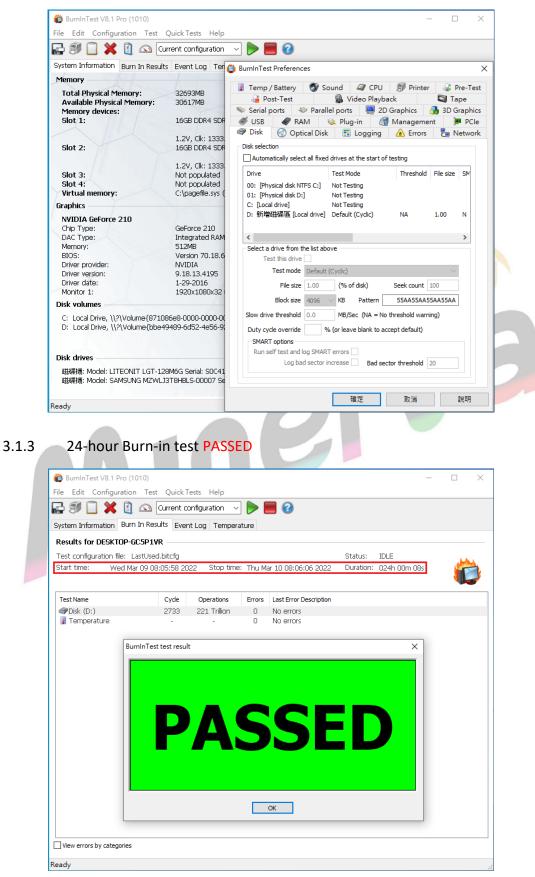
3. Burn In Tests and Results

- 3.1 BurnInTest v8.1 Pro for Samsung U.2 PM1733 / 4TB NVMe SSD
 - 3.1.1 System Information as below:



Minerva Innovation Company

3.1.2 Disk test mode(10 ways cycle test)



Minerva Innovation Company

4. Summary

- 4.1 U.2 NVMe SSD is PCIe Gen 4, 16GT/s , 4 Lanes Interface, I/O speed, max. to 64Gbps.
- 4.2 DP9504 Host Bus Adapter I/O performance is based on U.2 NVMe SSD.

