

MINERVA

EP4903 M.2 PCIe 5.0 with ReDriver for ARF6-16

Performance & Burn In Test Rev. 1.0

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1. Overview

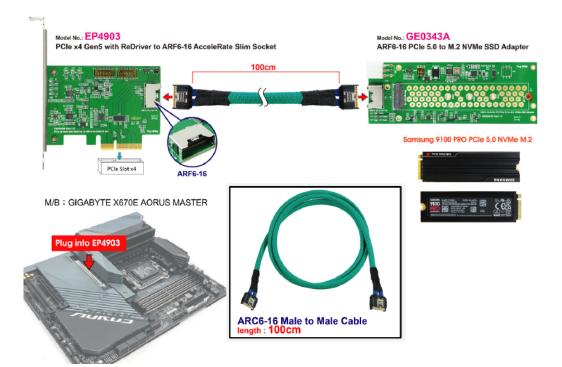
The Host Bus Adapter may provide PCIe x4 Gen 5, 32GT/s high-speed signals extension, bulit-in ReDriver controller to provide equalization up to **24 dB at 16 GHz** to ARF6-16. GE0343A Adapter, providing M.2 M-key connector can be M.2 NVMe SSD converted into ARF6-16 PCIe 5.0, 16GT/s 4-Lane interface.

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: | EP4903 PCIe x4 Gen 5 with Redriver to ARF6-16 AIC |
| Cable: | S2CEDA ARC6-16 Male to Male PCIe 5.0, 100cm Cable |
| Adapter: | GE0343A ARF6-16 to M.2 with Hot Plug Power protection adapter |
| OS : | Microsoft Windows 11 64bit OS |

2.2 Test target: EP4903 AIC, GE0343A Adapter & Samsung 9100 pro 2TB PCIe 5.0 M.2 SSD



2.3 Install Hardware

Inserts M.2 NVMe SSD into GE0343A adapter converter's M.2 M-key connector, and then with coppers, and screws to fix SSDs. (Please refer to the Installation Notes). Connects GE0343A converter to EP4903 AIC(PCIe x4 Gen 5 with Redriver to ARF6-16 AIC), Using ARC6-16 Male to Male, 100cm cable and plugs EP4903 into PCIe x16 Slot of GIGABYTE X670E AORUS MASTER

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2.4 BIOS & Windows 10 OS environment setup

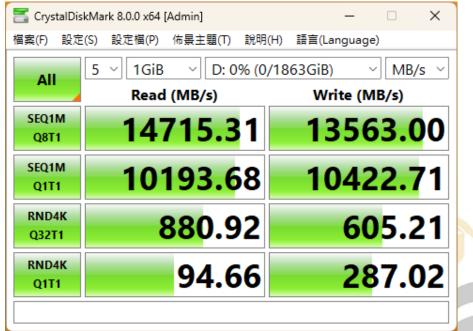
- 2.4.1 Primary SATA SSD installed Windows 11 OS.
- 2.4.2 M.2 NVMe SSD, formatted to NTFS Mode. Don't install any program.

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2.5 CrystalDiskMark 8.0 x64 performance test

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

2.5.1 Samsung M.2 NVMe SSD/ 2TB performance as below:



2.6 AS SSD Benchmark 2.0.7 performance test

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

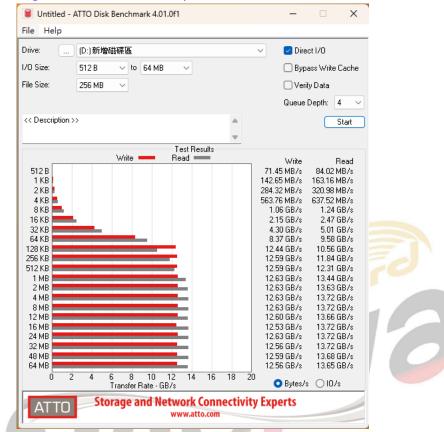
2.6.1 Samsung M.2 NVMe SSD/ 2TB performance as below:

| AS SSD Benchmark 2.0.731 | 6.34247 | – 🗆 X | | | |
|---|--------------|--------------|--|--|--|
| File Edit View Tools D: Samsung SSD 9100 PRO with | | | | | |
| Samsung SSD 9100 0B2QNXH7 stornyme - OK 16384 K - OK 1863.01 GB | Read: | Write: | | | |
| Seq | 11755.20 | 10149.65 | | | |
| ☑ 4K | 88.56 MB/s | 262.91 MB/s | | | |
| 4K-64Thrd | 3944.65 MB/s | 3824.25 MB/s | | | |
| Acc.time | 0.013 ms | 0.015 ms | | | |
| Score: | 5209 | 5102 | | | |
| | 128 | 879 | | | |
| | , | :: | | | |
| Start Abort | | | | | |

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2.7 ATTO Disk Benchamrk 4.01 performance test

2.7.1 Samsung M.2 NVMe SSD/ 2TB performance as below:



2.8 AnvilBenchmark_V110_B337

2.8.1 Samsung M.2 NVMe SSD/ 2TB performance as below:

| ile Benchmark | s IOmeter | System Info | Settings | Test size 1GB | 🔽 Drive 🔳 d: 🕅 | 新増磁碟區] | ✓ Screenshot H | lelp | |
|-------------------------------------|-----------|--------------|------------|---------------|----------------|-----------|--|---------|-----|
| SD Bench | no o ul c | , , | | | | Samsu | ng SSD 9100 PRC | with He | ats |
| SD bench | mark | | | | | | 2TB 2000 | GB/0B2Q | N) |
| Read | Resp. t | ime | MB read | IOPS | MB/s | | | | |
| Seq 4MB | 0.3965 | ms | 2,048.0 | 2,522.17 | 10,088.67 | | | | |
| 4K | 0.0428 | ms | 1,140.4 | 23,355.85 | 91.23 | | | | |
| 4K QD4 | 0.0430 | ms | 4,538.6 | 92,949.59 | 363.08 | | 16,445.51 | 1 | |
| 4K QD16 | 0.0497 | ms | 15,714.8 | 321,838.77 | 1,257.18 | Run read | 16,445.51 | | |
| 32K | 0.0561 | ms | 4,000.0 | 17,809.93 | 556.56 | | | | |
| 128K | 0.0856 | ms | 16,000.0 | 11,686.30 | 1,460.79 | Dum | 39,965.44 | 965.44 | |
| Write | Resp. t | ime 🛛 🕅 | 1B written | IOPS | MB/s | Run | 39,5 | 705.44 | |
| Seq 4MB | 0.3672 | ms | 1,024.0 | 2,723.40 | 10,893.62 | | | | |
| 4K | 0.0140 | ms | 640.0 | 71,423.16 | 279.00 | Bun write | 23,519.92 23,519.92 | | |
| 4K QD4 | 0.0152 | ms | 640.0 | 263,827.55 | 1,030.58 | Transwite | 20,010.02 | | |
| 4K QD16 | 0.0223 | ms | 640.0 | 718,386.23 | 2,806.20 | | | | |
| | | | | | | | | | |
| Microsoft Windows | | 元 Build (226 | 31) | Drives : | | | Samsung SSD 9100 F Drive D: 1,863.0/1,861. | | |
| X670E AORUS MAS AMD Ryzen 5 7600 | | or | | Notes : | | | NTFS - Cluster size 4096 | B | |
| Memory : 64,630 M | В | | | | | | Storage driver stornv | ne | |
| Professional E | | | | | | | Alignment 16384KB OK Compression 100% (Inco | | |

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3. Burn In Tests and Results

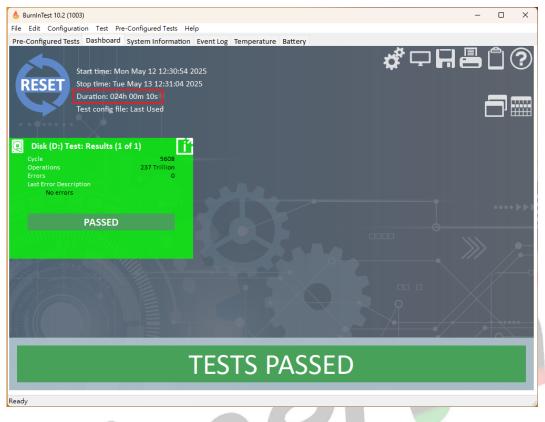
3.1 BurnInTest v10 Pro for Samsung M.2 NVMe SSD/ 2TB

3.1.1 **System Information** as below:

| 👶 BurnInTest 10.2 (1003) | - | |
|---|---|----------|
| File Edit Configuration Test P | | |
| | g System Information Event Log Temperature Battery | |
| System summary | | |
| Windows 11 Home build 22631 1 x AMD Ryzen 5 7600X 6-Core 63GB RAM, NVIDIA GeForce GT 730, 1863GB SSD, 119GB SSD, | | |
| General | | |
| System Name: Motherboard Manufacturer: Motherboard Model: Motherboard Version: Motherboard Serial Number: BIOS Manufacturer: | DESKTOP-FFA63F3 Gigabyte Technology Co., Ltd. X670E AORUS MASTER X.x Default string American Megatrends International, LLC. | |
| BIOS Version: BIOS Release Date: BIOS Serial Number: TPM: | F33g 12/19/2024 Default string Available, V2.0 | •••• >] |
| CPU | Available, V2.0 | |
| CPU manufacturer: CPU manufacturer: 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: L2 Cache: L2 Cache: L3 Cache: J3 Cache: J4 Cache: J5 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 SSE4.1 SSE4.2 SSE4a AVX AVX2 FMA3 DEP PAE AMD64 AES Turbo core 4702.2 MHz 6 x 32 KB 6 x 30 V | |
| Ready | | |
| & BurninTest 10.2 (1003) | | - O X |
| File Edit Configuration Test F | | |
| Memory | d System Information Event Log Temperature Battery | |
| Total Physical Memory: Available Physical Memory: Memory devices: DIMM 0: DIMM 1: DIMM 1: | 64630MB 60362MB Not populated DDR5, 32768MB, 4800MHz, Not populated DDR5, 32768MB, 4800MHz, | |
| Virtual memory: | C:\pagefile.sys (allocated base size 4096MB) | |
| Graphics NVIDIA GeForce GT 730 Chip Type: DAC Type: Memory: BIOS: | 0x1287 Integrated RAMDAC 2047MB 80.28.06.00.13 | |
| Driver provider: Driver version: Driver date: Monitor 1: | NVIDIA 456.71 9-30-2020 1920x1080x32 60Hz 96 DPI (Primary monitor) | •••• >1 |
| Disk volumes | | |
| C: Local Drive, \\?ce: D: Local Drive, \\?43 Disk drives | 2e82c7-b5bd-44ae-9883-832094a3eaa2八 NTFS, (118.34GB total, 4.68GB free) 740869-5905-400d-a850-8c0b7d5ec77b八 新增磁碟區, NTFS, (1863.00GB total, 1861.84GB free) | |
| 磁碟機: Model: Samsung SSD 磁碟機: Model: Crucial_CT128 | 9100 PRO with Heatsink 2TB Serial: S7ZNNJ0Y404173L (Disk: 1, SSD, Size: 1863.01GB, Interface: NVMe, Volumes: D M550SSD3 Serial: 14230C32D185 (Disk: 0, SSD, Size: 119.24GB, Interface: SATA, Volumes: C) | |
| Optical drives Network | | |
| Ready | | |

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3.1.2 24-hour Burn-in test PASSED



4. Summary

- 4.1 M.2 NVMe SSD is PCIe 5.0, 32GT/s, 4 Lanes Interface, I/O speed, max. to 128Gbps.
- 4.2 EP4903 AIC I/O performance is based on M.2 NVMe SSD.
- 4.3 GE0343A adapter I/O performance is based on M.2 NVMe SSD.