Thermal & Function Test Report

SR700-X4M-A20X

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Revision Date: March 12, 2024

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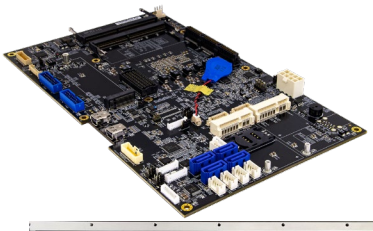
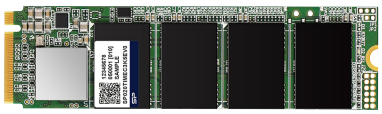
1. SPECIFICATION

1-1. PHOTOS

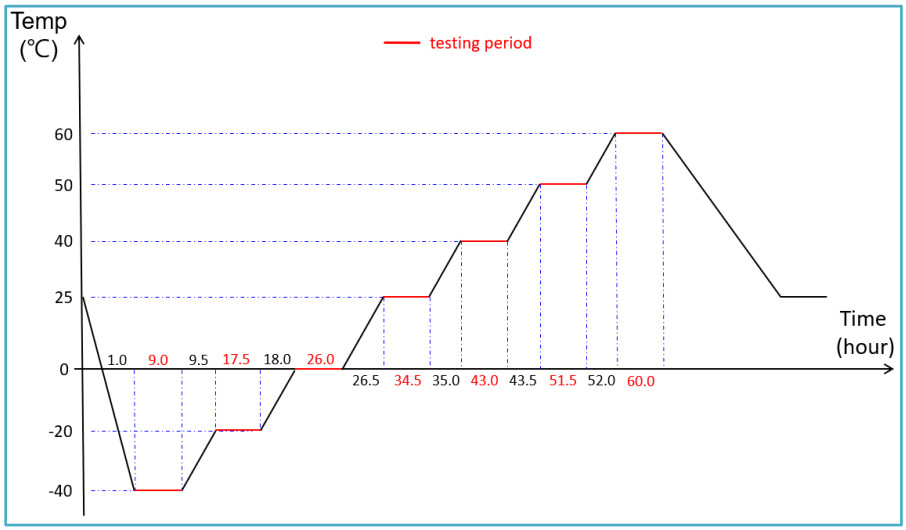





1-2. SYSTEM CONFIGURATION

System Configuration	
Motherboard	OXY5741B Chipset: CM246 BIOS Version: 5.13 SMBIOS Version: 3.2
CPU	Intel® Xeon® E-2276ML Processor (12M Cache- 2.00 GHz) Total Cores: 6 Total Threads: 12 Max Turbo Frequency: 4.20 GHz Intel® Turbo Boost Technology 2.0 Frequency: 4.20 GHz Processor Base Frequency: 2.00 GHz Bus Speed: 8 GT/s TDP: 25 Walt
Memory	SAMSUNG M471A4G43AB1-CWE 32GB
Storge	Silicon Power SP020TIMEC3K5EV0WT 2TB
GPU	NVIDIA GeForce® A2000 MXM 3.1 Graphic Module, Form Factor: MXM 3.1, Type A (82mm x 70mm) Graphics Architecture: NVIDIA® Ampere™ GA107-980-A1 CUDA Parallel-Processing Cores: 2560 CUDA® cores GPU Base/Boost Clock: 1117 MHz / 1612 MHz Operating Temperature: 0 ~ 55 °C (Depending on CPU and cooler solution) Non-Operating Temperature: -40 °C ~ 85 °C

2. TEST PLAN

2.1. THERMAL MEASUREMENT PROCESS

Test Purpose	The purpose of performing thermal profile testing is to identify potential thermal issues with the EUT. Considering that semiconductor failure rates rise rapidly with increasing junction temperature, it can aid product reliability assessment. As the system cools down, the mode will change with stack selection, temperature/heat. Mapping can help develop the best tracking arrangements.
Test Equipment	1. KSON THS-B4T-150 Chamber.
Quantity Tested	Minimum 1 Set
Test Software	1. PassMark Burn-In Test(Ver.9.0) under Windows 10 Pro. 2. AIDA64 stress GPU.
Test Procedure	1. Thermal pre-scan measurement: Temperature: **-40˚C～60˚C/60%RH** 2. Actual thermal measurement: 2-1. Select the test point based on the infrared photo and connect the thermocouple to the hot spot. 2-2. Place the EUT into the hot chamber and set the test temperature curve Specification. 2-3. Open the hot cell and power up the EUT, enter the Windows 10 Pro (22H2) environment and perform a maximum power test + stress application. 2-4. After the EUT executes the test software for 8 hours, record the maximum heat generation of each thermocouple point. 2-5. Turn off the hot cell and EUT. 2-6. Verify and check that the recorded information for each component complies with the operating temperature range listed in the specification/approval sheet for each component being tested.
Test Diagram of Curves	Environment defines for 60 hours. 

2.2. Test Result <Test Item>

2.2.1 Temperature Cycle

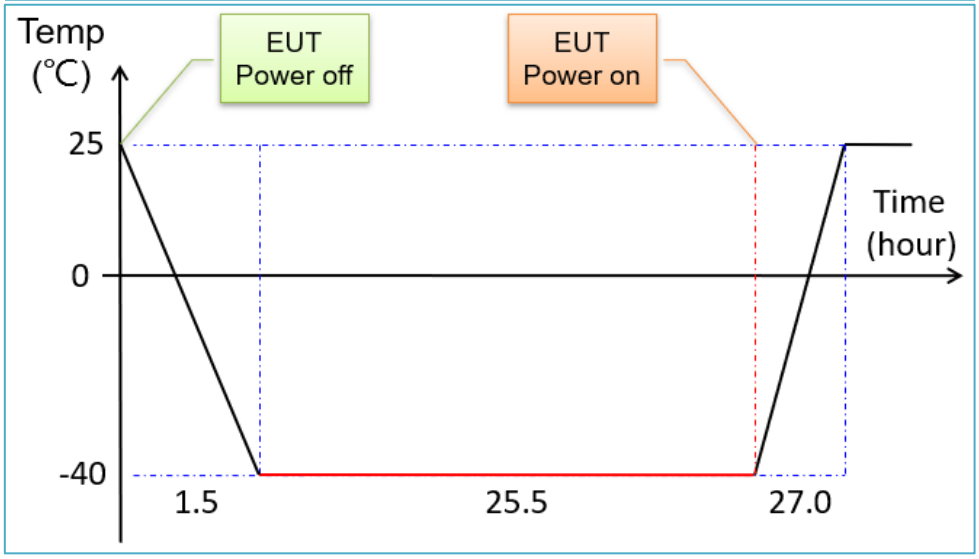
Aging test of various parts at different temperatures under maximum load and full load conditions.

Test Temperature	Test Result
-40˚C	PASS
-20˚C	PASS
0˚C	PASS
25˚C	PASS
40˚C	PASS
50˚C	PASS
60˚C	PASS

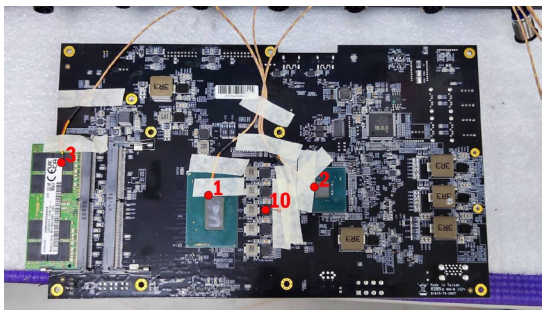
2.2.2 Cold Boot at Low-Temperature

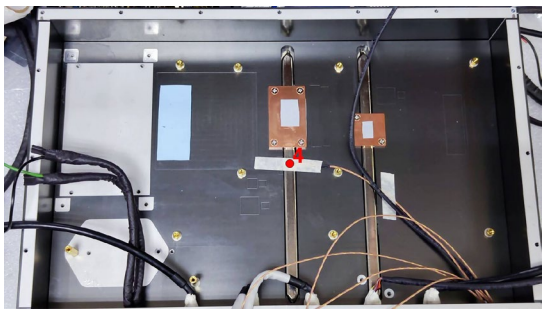
#Power supply under -40°C and ensure that the system boot up properly

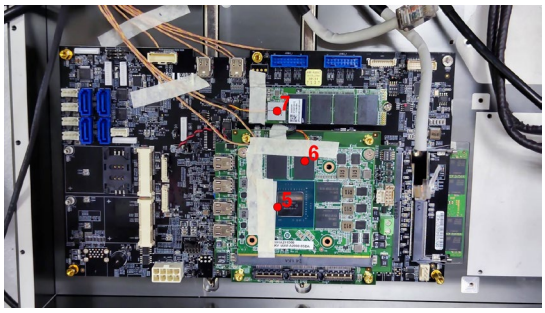
Ambient Temp.	Test Result
-40°C	PASS

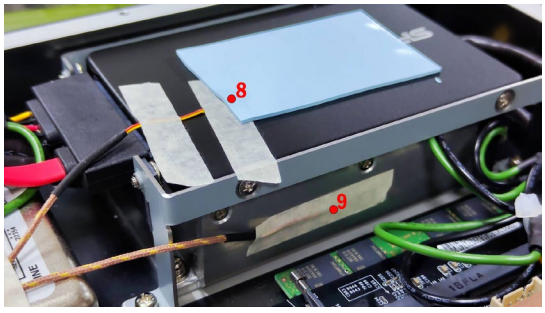


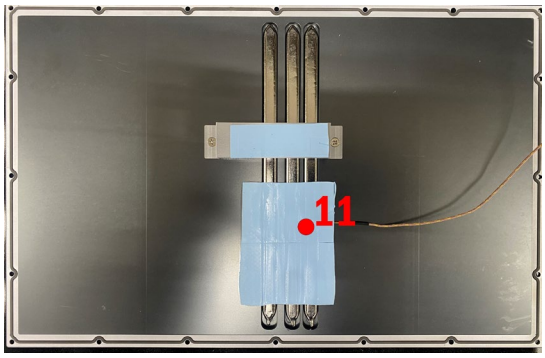
3. THERMAL TEST POINT







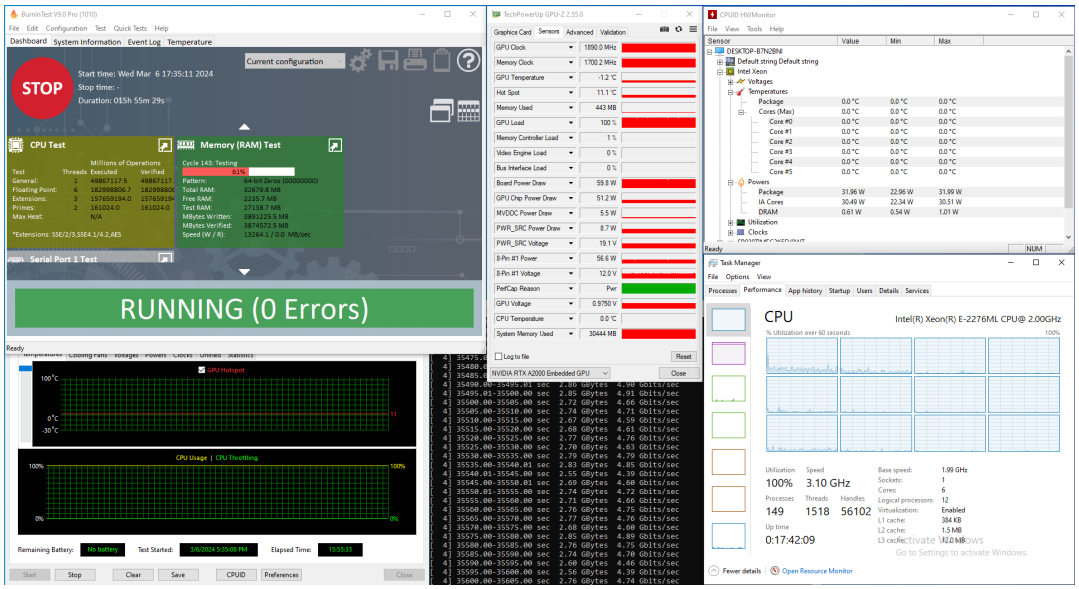




Test Point	Test Point
CH1	CPU
CH2	PCH
CH3	DRAM
CH4	CPU TPHS
CH5	A2000 GPU
CH6	GPU RAM
CH7	M.2
CH8	2.5SSD
CH9	SK715
CH10	PU3 MOS
CH11	GPU Heatsink

4. TEST PHOTO IN LAB

- Chamber in -40°C



Test Point	Ambient Temp.	-40°C
	CPU AVG. FRQ.	3100 MHz
	CPU Tj. Temp.	0 °C
	GPU AVG. FRQ.	1890 MHz
	GPU Tj. Temp.	-1.2 °C
CH1	CPU	-23.3 °C
CH2	PCH	-27.5 °C
CH3	DRAM	-30.8 °C
CH4	CPU TPHS	-26.2 °C
CH5	A2000 GPU	-13.6 °C
CH6	GPU RAM	-18.3 °C
CH7	M.2	-27.1 °C
CH8	2.5 SSD	-31.4 °C
CH9	SK715	-30.2 °C
CH10	PU3 MOS	-20.9 °C
CH11	GPU Heatsink	-21.4 °C

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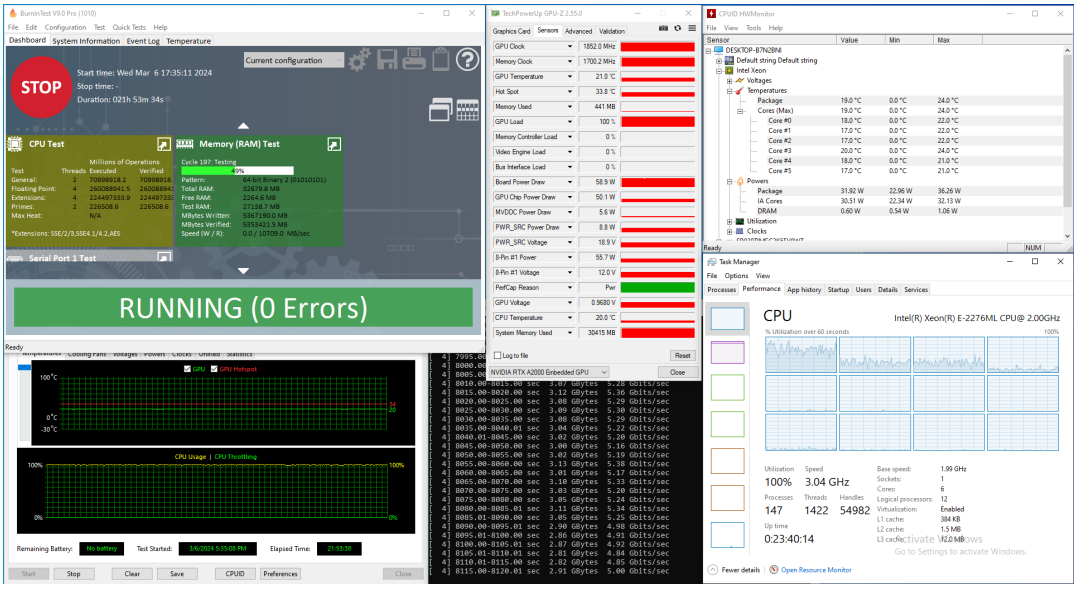
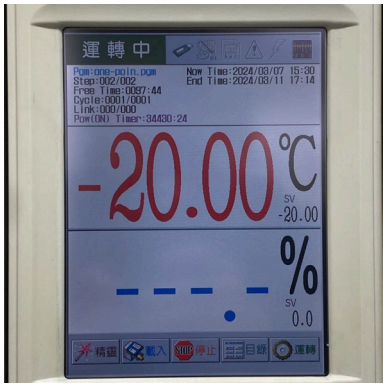
- Chamber in -20°C





Test Point	Ambient Temp.	-20°C
	CPU AVG. FRQ.	3040 MHz
	CPU Tj. Temp.	19 °C
	GPU AVG. FRQ.	1852 MHz
	GPU Tj. Temp.	21 °C
CH1	CPU	0.8 °C
CH2	PCH	-4.4 °C
CH3	DRAM	-8.1 °C
CH4	CPU TPHS	-3.1 °C
CH5	A2000 GPU	8.7 °C
CH6	GPU RAM	4.1 °C
CH7	M.2	-5 °C
CH8	2.5 SSD	-9.3 °C
CH9	SK715	-7.8 °C
CH10	PU3 MOS	4 °C
CH11	GPU Heatsink	0.6 °C

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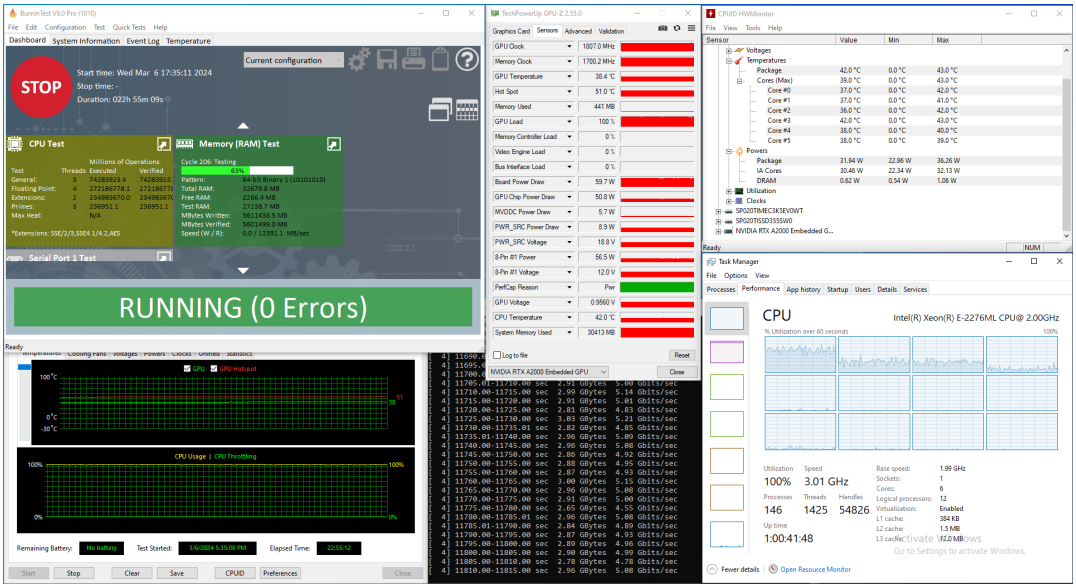
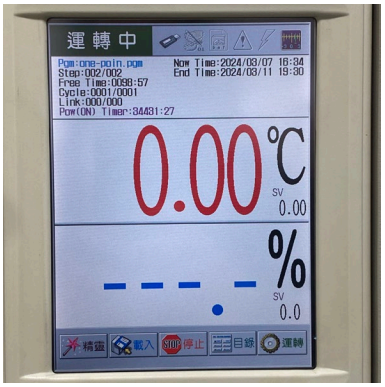
- Chamber in 0°C





Test Point	Ambient Temp.	0°C
	CPU AVG. FRQ.	3010 MHz
	CPU Tj. Temp.	42 °C
	GPU AVG. FRQ.	1807 MHz
	GPU Tj. Temp.	38.4 °C
CH1	CPU	19.5 °C
CH2	PCH	14.6 °C
CH3	DRAM	11.3 °C
CH4	CPU TPHS	17.7 °C
CH5	A2000 GPU	26.5 °C
CH6	GPU RAM	22.2 °C
CH7	M.2	15.4 °C
CH8	2.5 SSD	10.1 °C
CH9	SK715	11.5 °C
CH10	PU3 MOS	23.9 °C
CH11	GPU Heatsink	18.7 °C

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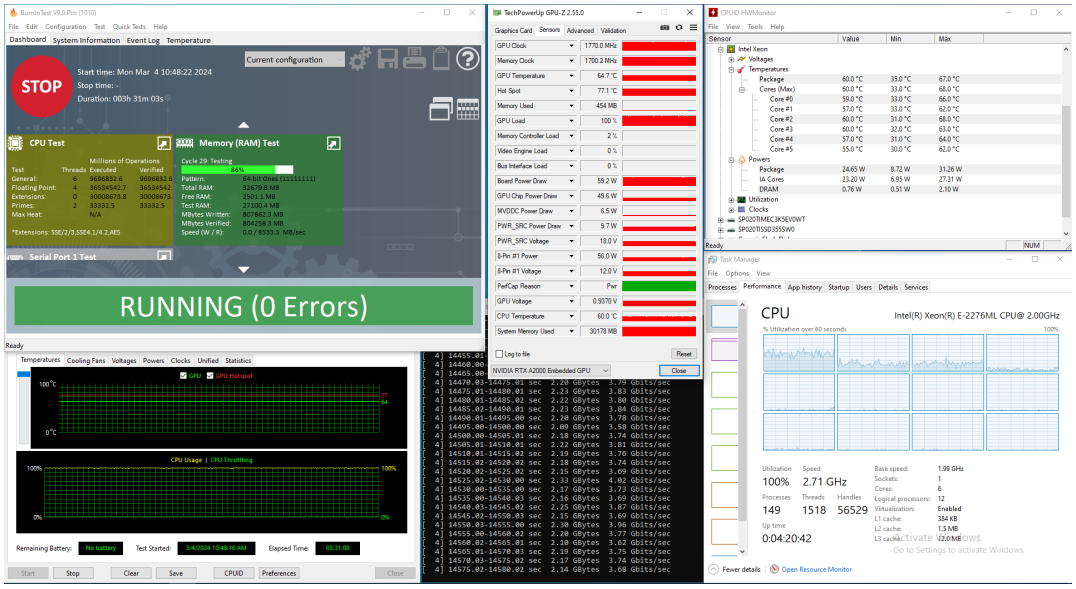
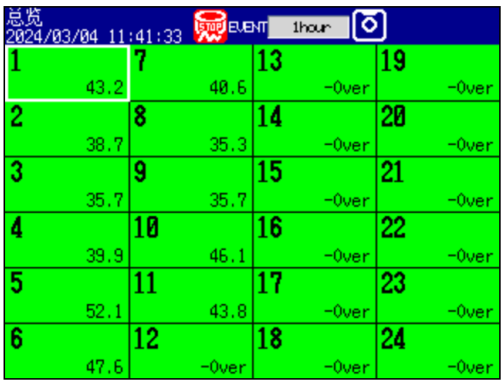
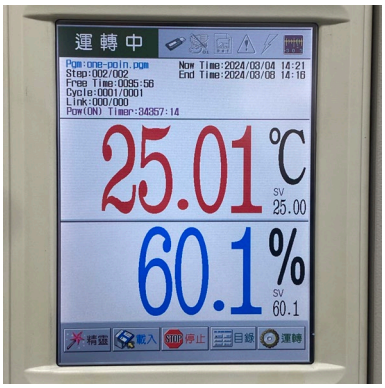
- Chamber in 25°C







Test Point	Ambient Temp.	25°C
	CPU AVG. FRQ.	2710 MHz
	CPU Tj. Temp.	60.0 °C
	GPU AVG. FRQ.	1770 MHz
	GPU Tj. Temp.	64.7 °C
CH1	CPU	43.2 °C
CH2	PCH	38.7 °C
CH3	DRAM	35.7 °C
CH4	CPU TPHS	39.9 °C
CH5	A2000 GPU	52.1 °C
CH6	GPU RAM	47.6 °C
CH7	M.2	40.6 °C
CH8	2.5 SSD	35.3 °C
CH9	SK715	35.7 °C
CH10	PU3 MOS	46.1 °C
CH11	GPU Heatsink	43.8 °C

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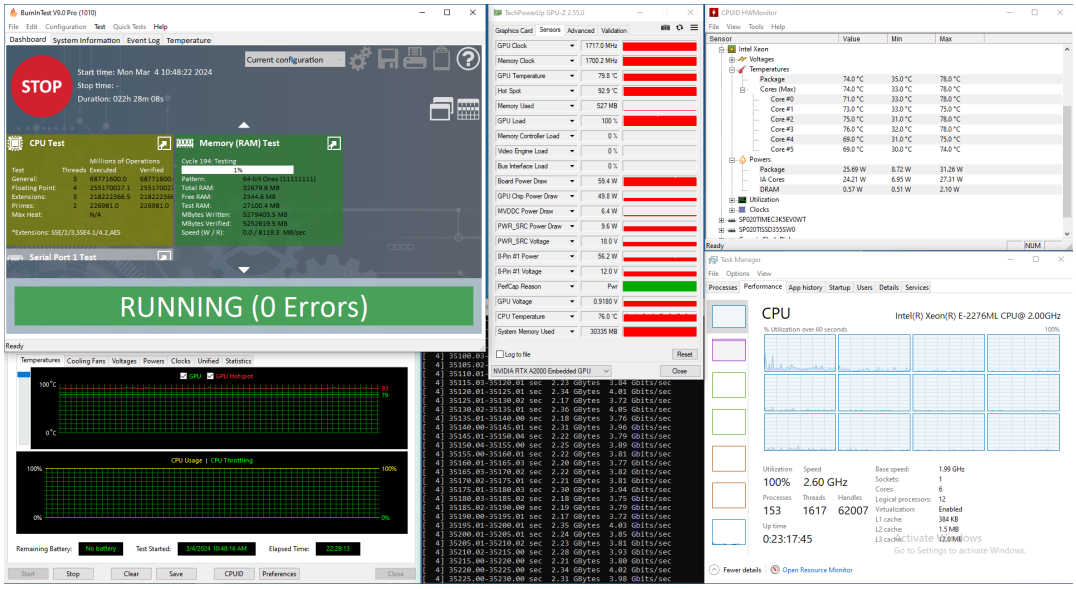
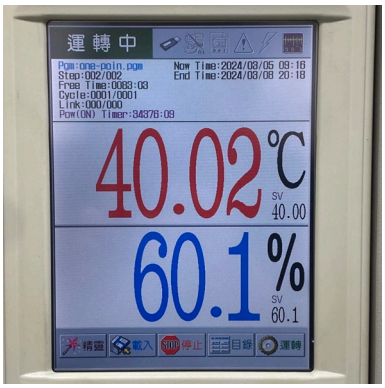
- Chamber in 40°C





Test Point	Ambient Temp.	40°C
	CPU AVG. FRQ.	2600 MHz
	CPU Tj. Temp.	74.0 °C
	GPU AVG. FRQ.	1717 MHz
	GPU Tj. Temp.	79.8 °C
CH1	CPU	58.2 °C
CH2	PCH	53.5 °C
CH3	DRAM	50.4 °C
CH4	CPU TPHS	55.0 °C
CH5	A2000 GPU	66.8 °C
CH6	GPU RAM	62.7 °C
CH7	M.2	55.5 °C
CH8	2.5 SSD	50.1 °C
CH9	SK715	50.7 °C
CH10	PU3 MOS	61.9 °C
CH11	GPU Heatsink	58.7 °C

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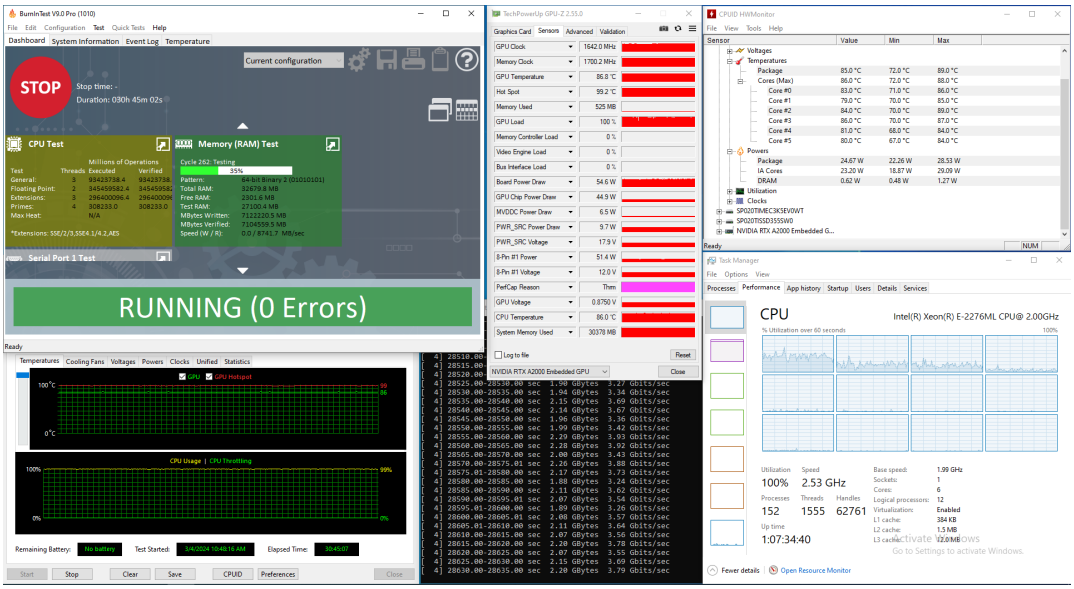
- Chamber in 50°C



Test Point	Ambient Temp.	50°C
	CPU AVG. FRQ.	2530 MHz
	CPU Tj. Temp.	85.0 °C
	GPU AVG. FRQ.	1642 MHz
	GPU Tj. Temp.	86.8 °C
CH1	CPU	68.2 °C
CH2	PCH	63.4 °C
CH3	DRAM	60.5 °C
CH4	CPU TPHS	65.0 °C
CH5	A2000 GPU	75.2 °C
CH6	GPU RAM	71.5 °C
CH7	M.2	65.0 °C
CH8	2.5 SSD	59.9 °C
CH9	SK715	60.8 °C
CH10	PU3 MOS	72.3 °C
CH11	GPU Heatsink	67.9 °C

Thermal & Function Test Report

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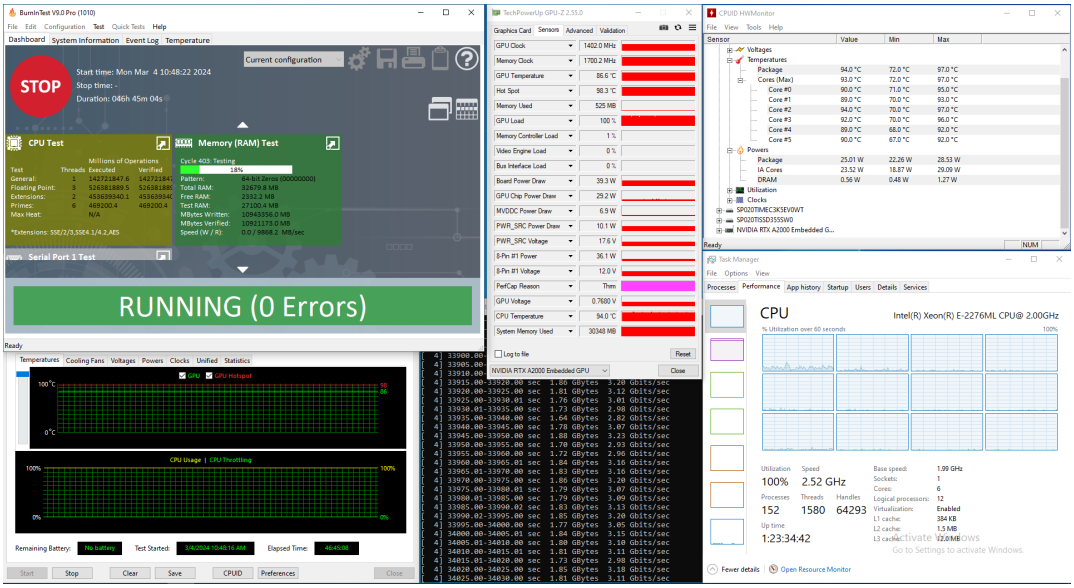
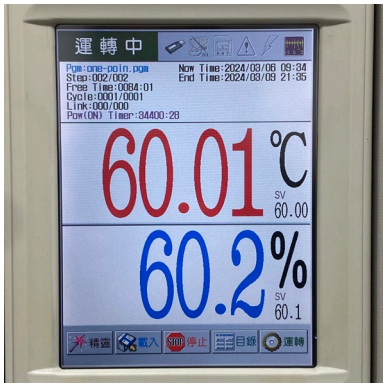
- Chamber in 60°C





Test Point	Ambient Temp.	60°C
	CPU AVG. FRQ.	2520 MHz
	CPU Tj. Temp.	94.0 °C
	GPU AVG. FRQ.	1402 MHz
	GPU Tj. Temp.	86.6 °C
CH1	CPU	76.5 °C
CH2	PCH	71.8 °C
CH3	DRAM	69.0 °C
CH4	CPU TPHS	73.9 °C
CH5	A2000 GPU	78.7 °C
CH6	GPU RAM	76.5 °C
CH7	M.2	72.0 °C
CH8	2.5 SSD	67.6 °C
CH9	SK715	69.3 °C
CH10	PU3 MOS	80.8 °C
CH11	GPU Heatsink	73.3 °C

5. THERMAL TEST RESULT(-40˚C ~ +60˚C)

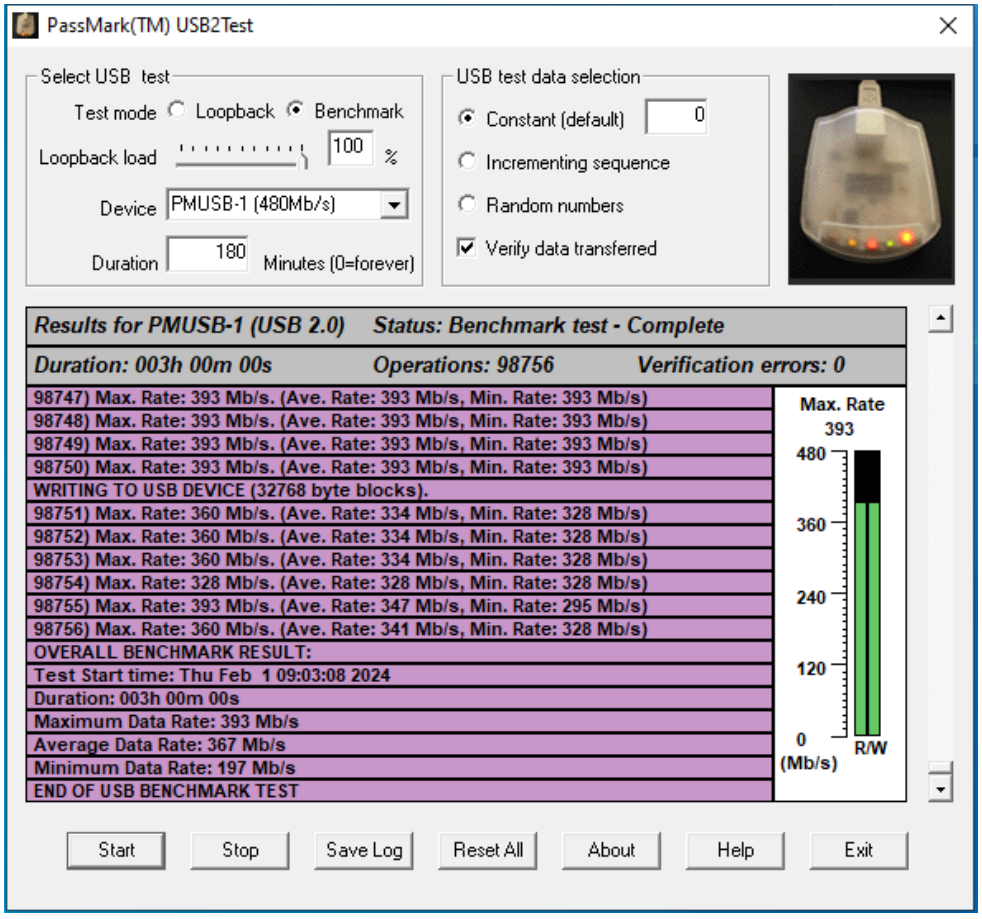
CPU Temperature and Frequency

	Core Temp / Ambient Temp / CPU Frequency	-40°C	-20°C	0°C	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
	CPU Avg. Frequency	3100 MHz	3040 MHz	3010 MHz	2710 MHz	2600 MHz	2530 MHz	2520 MHz
	CPU Tj. Temperature	0.0 °C	19.0 °C	42.0 °C	60.0 °C	74.0 °C	85.0 °C	94.0 °C
	GPU Avg. Frequency	1890 MHz	1852 MHz	1807 MHz	1770 MHz	1717 MHz	1642 MHz	1402 MHz
	GPU Tj. Temperature	-1.2 °C	21.0 °C	38.4 °C	64.7 °C	79.8 °C	86.8 °C	86.6 °C

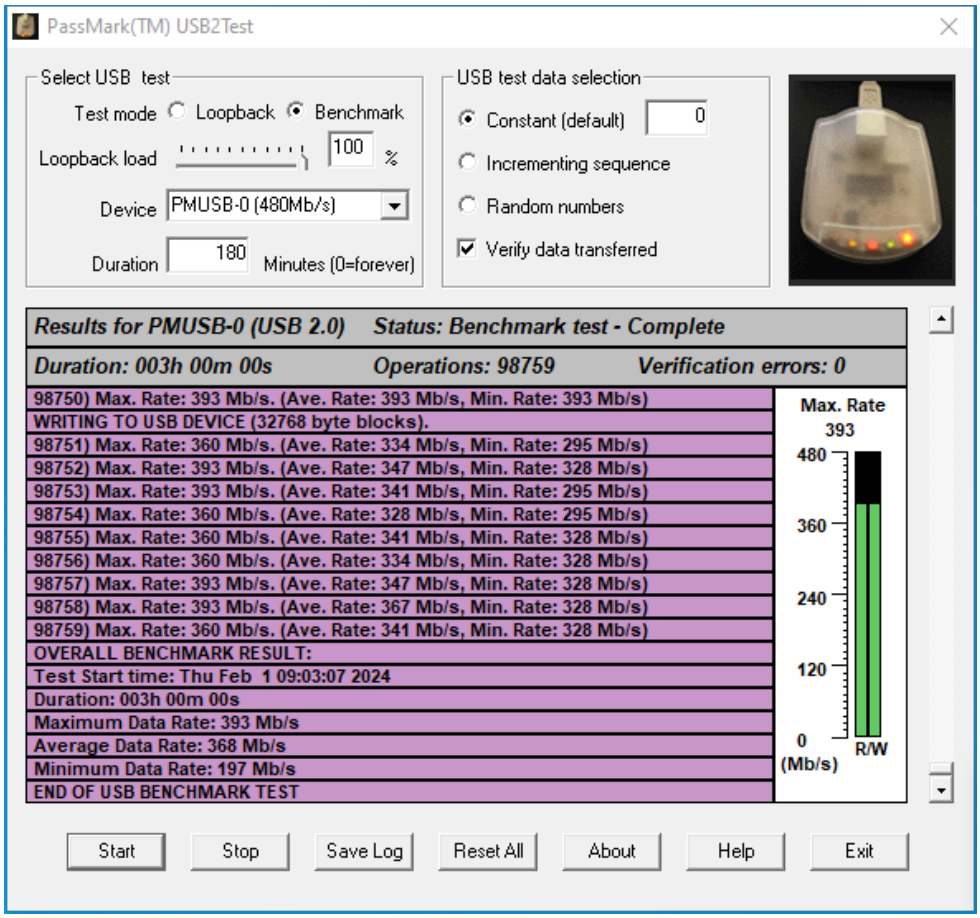
	Measurement Point / Ambient Temp	-40°C	-20°C	0°C	25°C 60% RH	40°C 60% RH	50°C 60% RH	60°C 60% RH
CH1	CPU	-23.3 °C	0.8 °C	19.5 °C	43.2 °C	58.2 °C	68.2 °C	76.5 °C
CH2	PCH	-27.5 °C	-4.4 °C	14.6 °C	38.7 °C	53.5 °C	63.4 °C	71.8 °C
CH3	DRAM	-30.8 °C	-8.1 °C	11.3 °C	35.7 °C	50.4 °C	60.5 °C	69.0 °C
CH4	CPU TPHS	-26.2 °C	-3.1 °C	17.7 °C	39.9 °C	55.0 °C	65.0 °C	73.9 °C
CH5	A2000 GPU	-13.6 °C	8.7 °C	26.5 °C	52.1 °C	66.8 °C	75.2 °C	78.7 °C
CH6	GPU RAM	-18.3 °C	4.1 °C	22.2 °C	47.6 °C	62.7 °C	71.5 °C	76.5 °C
CH7	M.2	-27.1 °C	-5.0 °C	15.4 °C	40.6 °C	55.5 °C	65.0 °C	72.0 °C
CH8	2.5 SSD	-31.4 °C	-9.3 °C	10.1 °C	35.3 °C	50.1 °C	59.9 °C	67.6 °C
CH9	SK715	-30.2 °C	-7.8 °C	11.5 °C	35.7 °C	50.7 °C	60.8 °C	69.3 °C
CH10	PU3 MOS	-20.9 °C	4.0 °C	23.9 °C	46.1 °C	61.9 °C	72.3 °C	80.8 °C
CH11	GPU Heatsink	-21.4 °C	0.6 °C	18.7 °C	43.8 °C	58.7 °C	67.9 °C	73.3 °C

6. I/O FUNCTION TEST

6.1. USB PORT (High Speed 480Mbps)

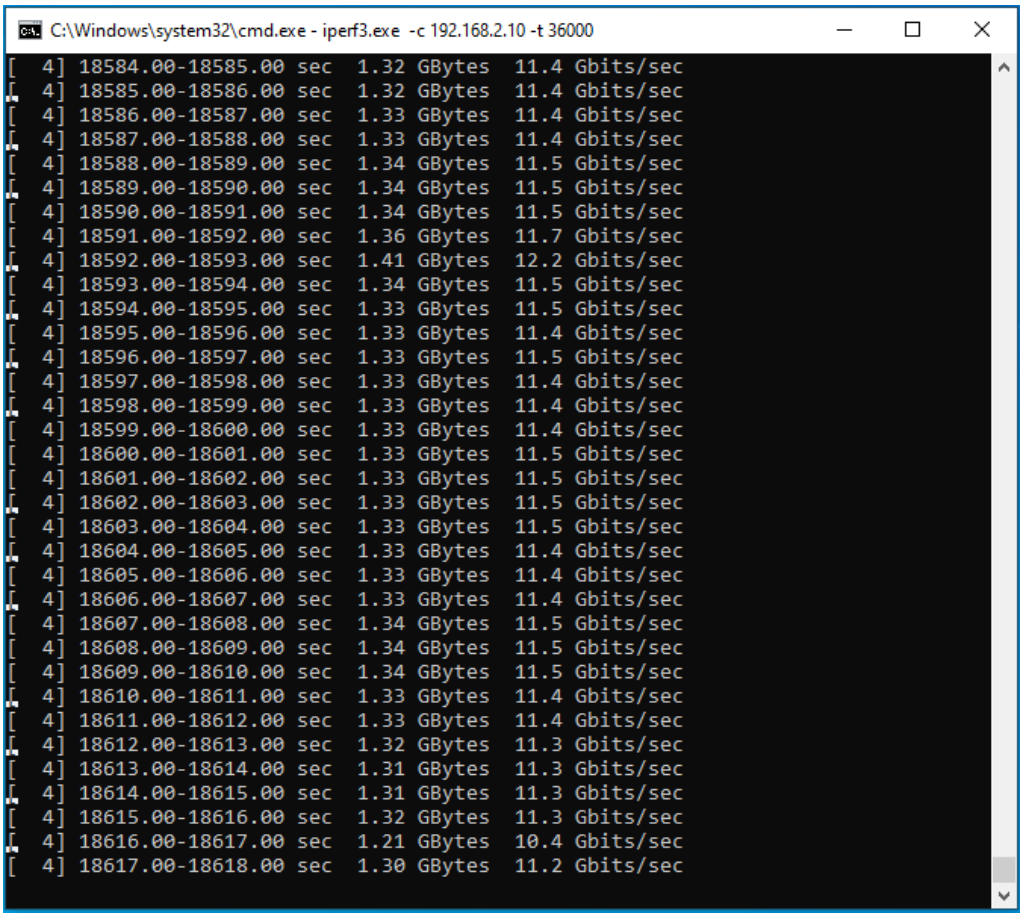


USB #1


PassMark(TM) USB2Test
Select USB test
Test mode
Loopback
Benchmark
Loopback load
100
%
Device
PMUSB-0 (480Mb/s)
Duration
180
Minutes (0=forever)
USB test data selection
Constant (default)
0
Incrementing sequence
Random numbers
Verify data transferred
Results for PMUSB-0 (USB 2.0)
Status: Benchmark test - Complete
Duration: 003h 00m 00s
Operations: 98759
Verification errors: 0
98750) Max. Rate: 393 Mb/s. (Ave. Rate: 393 Mb/s, Min. Rate: 393 Mb/s)
WRITING TO USB DEVICE (32768 byte blocks).
98751) Max. Rate: 360 Mb/s. (Ave. Rate: 334 Mb/s, Min. Rate: 295 Mb/s)
98752) Max. Rate: 393 Mb/s. (Ave. Rate: 347 Mb/s, Min. Rate: 328 Mb/s)
98753) Max. Rate: 393 Mb/s. (Ave. Rate: 341 Mb/s, Min. Rate: 295 Mb/s)
98754) Max. Rate: 360 Mb/s. (Ave. Rate: 328 Mb/s, Min. Rate: 295 Mb/s)
98755) Max. Rate: 360 Mb/s. (Ave. Rate: 341 Mb/s, Min. Rate: 328 Mb/s)
98756) Max. Rate: 360 Mb/s. (Ave. Rate: 334 Mb/s, Min. Rate: 328 Mb/s)
98757) Max. Rate: 393 Mb/s. (Ave. Rate: 347 Mb/s, Min. Rate: 328 Mb/s)
98758) Max. Rate: 393 Mb/s. (Ave. Rate: 367 Mb/s, Min. Rate: 328 Mb/s)
98759) Max. Rate: 360 Mb/s. (Ave. Rate: 341 Mb/s, Min. Rate: 328 Mb/s)
OVERALL BENCHMARK RESULT:
Test Start time: Thu Feb 1 09:03:07 2024
Duration: 003h 00m 00s
Maximum Data Rate: 393 Mb/s
Average Data Rate: 368 Mb/s
Minimum Data Rate: 197 Mb/s
END OF USB BENCHMARK TEST
Max. Rate
393
480
360
240
120
0
(Mb/s)
R/W
Start
Stop
Save Log
Reset All
About
Help
Exit

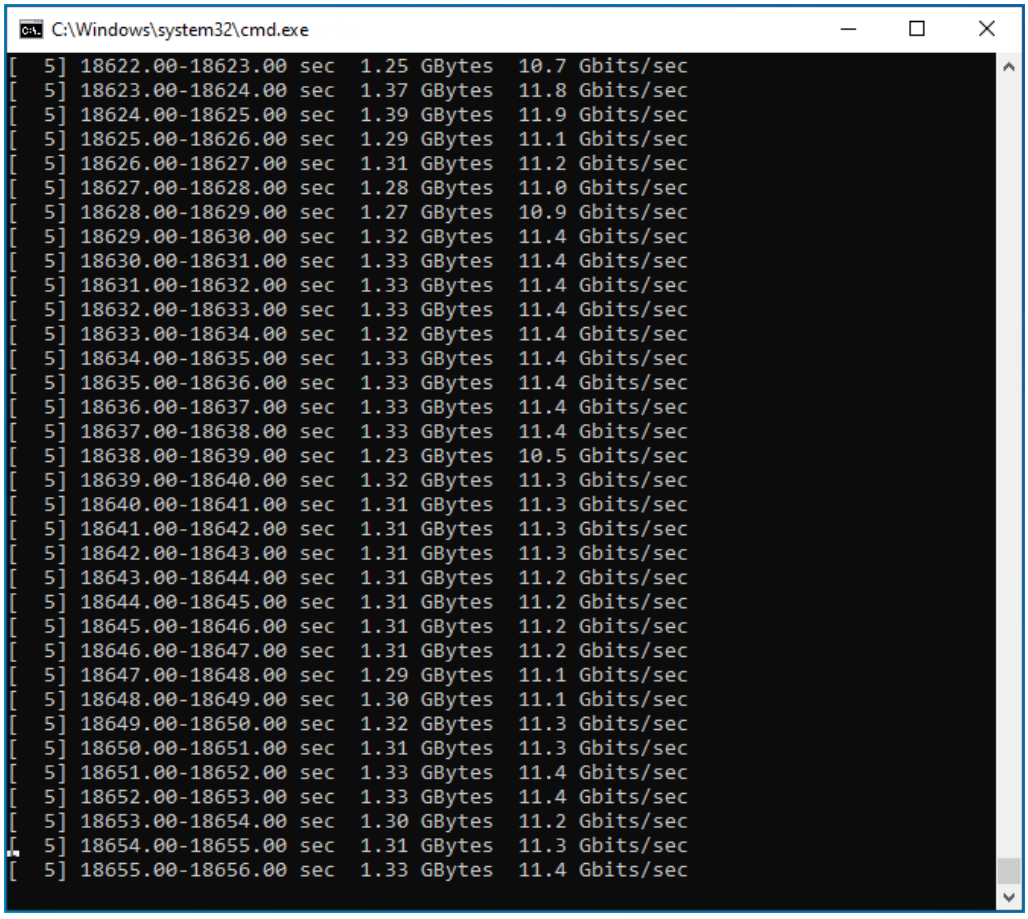
USB #2

6.2. LAN PORT #1 (1Gbps)



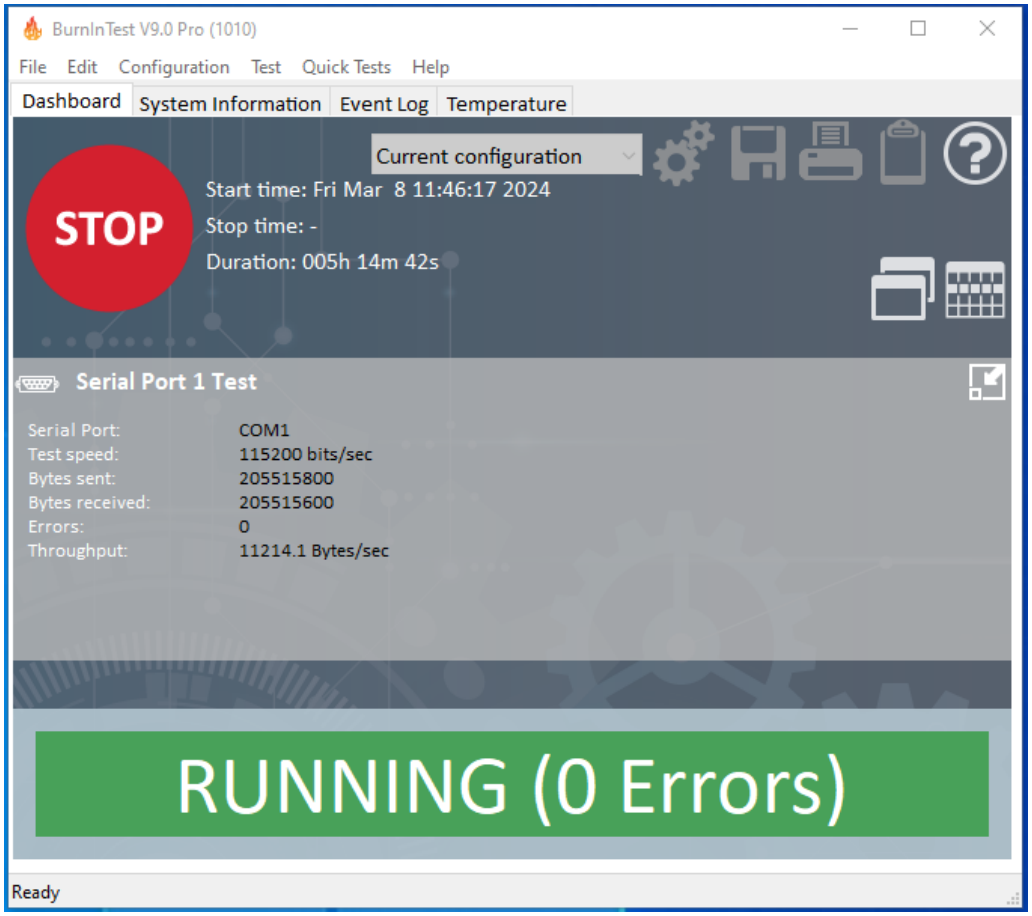
LAN #1

6.3. LAN Port #2 (1Gbps)



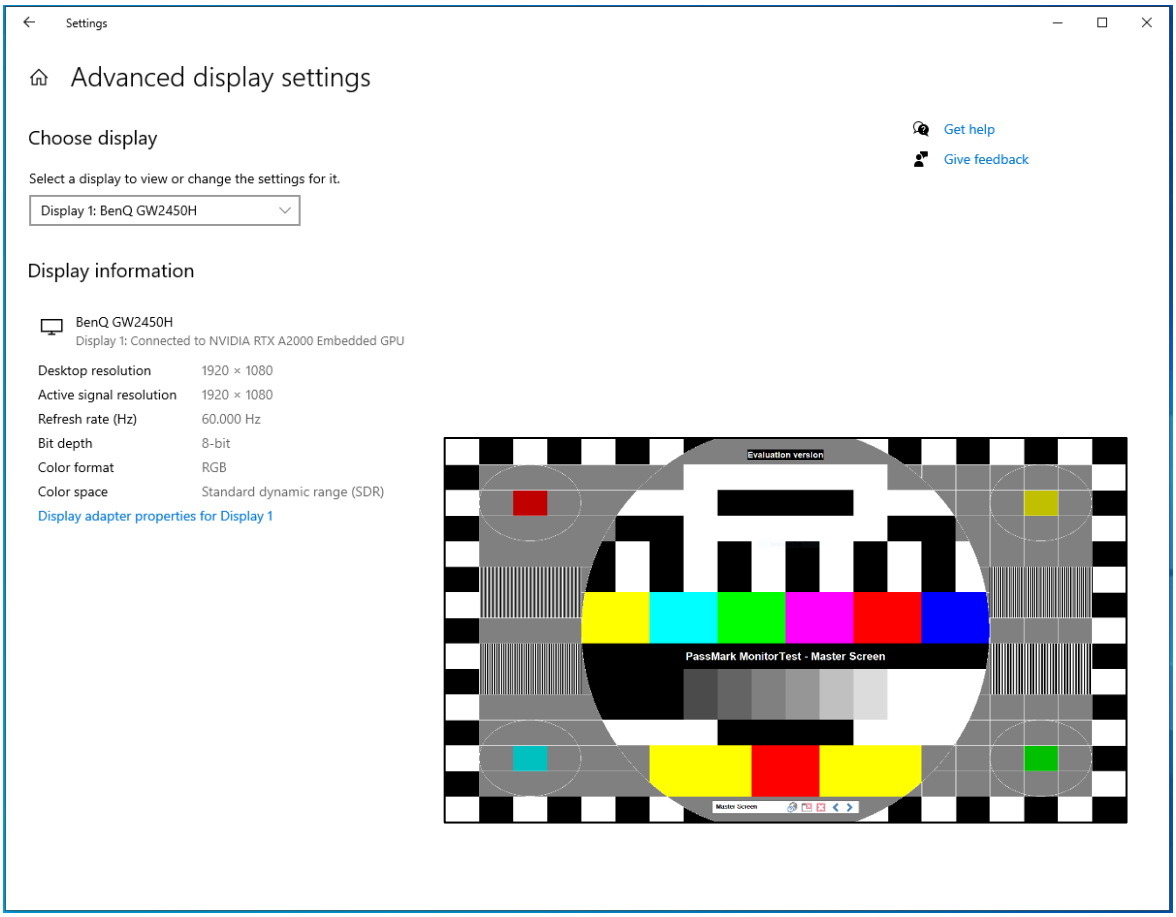
LAN #2

6.4. SERIAL PORT (RS-232)



6.5. VGA Port


X6


Settings
Advanced display settings
Choose display
Select a display to view or change the settings for it.
Display 1: BenQ GW2450H
Get help
Give feedback
Display information
BenQ GW2450H
Display 1: Connected to NVIDIA RTX A2000 Embedded GPU
Desktop resolution 1920 × 1080
Active signal resolution 1920 × 1080
Refresh rate (Hz) 60.000 Hz
Bit depth 8-bit
Color format RGB
Color space Standard dynamic range (SDR)
Display adapter properties for Display 1
Evaluation version
PassMark MonitorTest - Master Screen
