



Thermal & Functions Test Report

HORUS430-V1A



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Thermal & Functions Test Report

HORUS₄₃₀-X_{1A}

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1. SYSTEM SPEC

1-1. PRODUCT PHOTOS



1-2. SYSTEM COFIGURATION

System Configuration	
Motherboard	Sk515
CPU	11th Intel Xeon W-11865MLE
Memory	Samsuang SO-DIMM 32GB DDR4 3200 Mbps*2
SSD	7SLSSB960GMLEX-D2C-8) 960GB TLC
POWER BOARD	SK715 DC-IN 9V~36V, DC-OUT 12V 400W POWER
GPU	Nvidia A4500MXM GPU
LAN	10G SFP+ X2 Module for SK502-P WITH OUT FPE

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2. TEST PLAN

2.1. Thermal Measurement Process

Test Purpose	The purpose of performing thermal profile test is to identify potential thermal problem of the EUT. And it is to aid products in reliability assessment considering that semiconductor failure rates rise rapidly with increasing junction temperature. In case of systems cooling, patterns will vary with stacking choices, temperature/thermal mapping can aid in the development of optimum tacking arrangements																																
Test Equipment	1. KSON THS-B4T-150 Chamber 2. YOKOGAWA MV1000, Thermometer (FLUKE50D K/J)																																
Quantity Tested	Minimum 1 Set																																
Test Software	Passmark Burn-In Test under Windows 10																																
Test Procecedure	1. Thermal pre-scan measurement: Temperature: -40~55°C /85%RH 2. Thermal actual measurement: a. Select the test points according to the IR photo and attach thermocouples to the hot points b. Put the EUT in thermal chamber and set the temperature profile of as test specification c. Turn on the thermal chamber and power on the EUT to enter windows environment to run Max Power Test + 3DMARK 2011 application program d. After the EUT executing the test software for 4 hours, record thermal maximum value for each thermocouples point. e. Turn off the thermal chamber and EUT f. Verify and check recorded figure of each components to its' operating temperature range listed in specification/approval sheet of each measured component																																
Test diagram of curves	Environment defines for 8 hours <table border="1"><caption>Thermal Profile Data Points</caption><thead><tr><th>Time (hour)</th><th>Temperature (°C)</th></tr></thead><tbody><tr><td>0.5</td><td>25</td></tr><tr><td>0.5</td><td>-40</td></tr><tr><td>4.5</td><td>-40</td></tr><tr><td>5</td><td>-20</td></tr><tr><td>9</td><td>-20</td></tr><tr><td>9.5</td><td>0</td></tr><tr><td>13.5</td><td>0</td></tr><tr><td>14</td><td>25</td></tr><tr><td>18</td><td>25</td></tr><tr><td>18.5</td><td>40</td></tr><tr><td>22.5</td><td>40</td></tr><tr><td>23</td><td>50</td></tr><tr><td>27</td><td>50</td></tr><tr><td>27.5</td><td>55</td></tr><tr><td>31.5</td><td>55</td></tr></tbody></table>	Time (hour)	Temperature (°C)	0.5	25	0.5	-40	4.5	-40	5	-20	9	-20	9.5	0	13.5	0	14	25	18	25	18.5	40	22.5	40	23	50	27	50	27.5	55	31.5	55
Time (hour)	Temperature (°C)																																
0.5	25																																
0.5	-40																																
4.5	-40																																
5	-20																																
9	-20																																
9.5	0																																
13.5	0																																
14	25																																
18	25																																
18.5	40																																
22.5	40																																
23	50																																
27	50																																
27.5	55																																
31.5	55																																

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2.2. HORUS₄₃₀-X1A TEST RESULT<TEST ITEM>

2.2.1 TEMPERATURE CYCLE

Burn-in test under each temperature with maximum quantity of external devices on all I/O connected and full loading status on each device

Test Temperature	Test Result
-40℃	PASS
-20℃	PASS
0℃	PASS
25℃	PASS
40℃	PASS
50℃	PASS
55℃	PASS

2.2.2 I/O FUNCTION

#Confirm the system specifications and I/O connection to ensure that they are functioning properly

Item	Criteria	Result
10G LAN(X1,X2)	Connection 1G/10G/100G SWITCH HUB transfer data test	PASS
1G LAN(X3,X4)	Connection 1G/10G/100G SWITCH HUB transfer data test	PASS
COM(X5)	Check work well	PASS
USB2.0(X6)	USB2.0 can use any USB device	PASS
	PassMark USB2.0 Loopback Plugs for Troubleshooting and Testing USB 2.0 ports.	
DVI (X7,X8)	Check work well	PASS

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2.2.3 LOW-TEMP. BOOT-UP

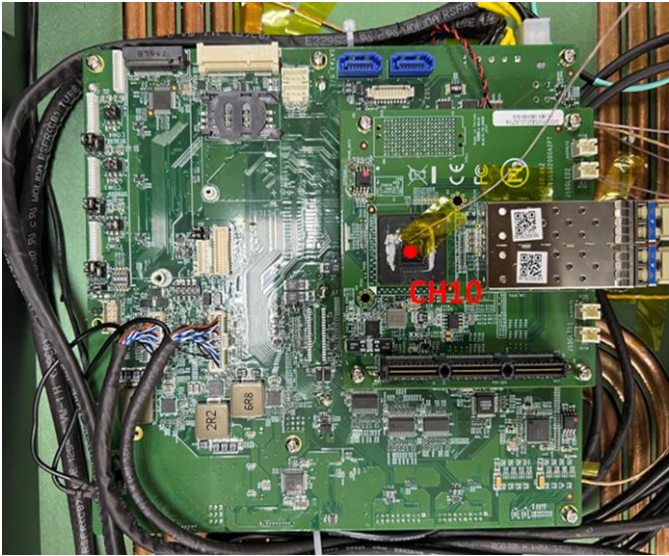
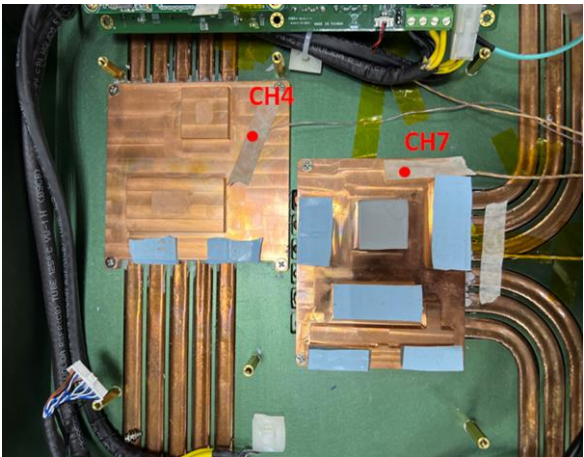
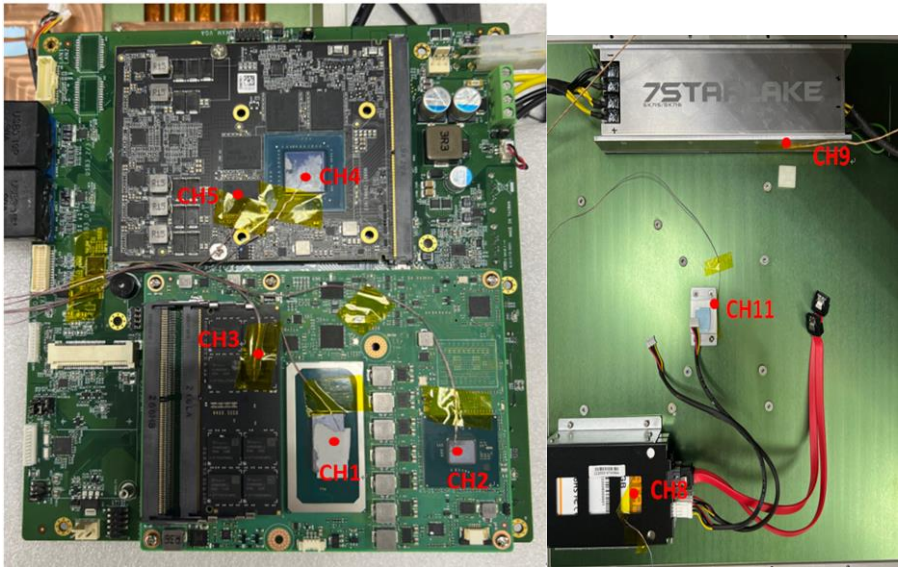
#Power supply under -40°C and ensure that the system boot up properly

Ambient Temp.	Test Result
-40°C	PASS

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3. THERMAL TEST POINT



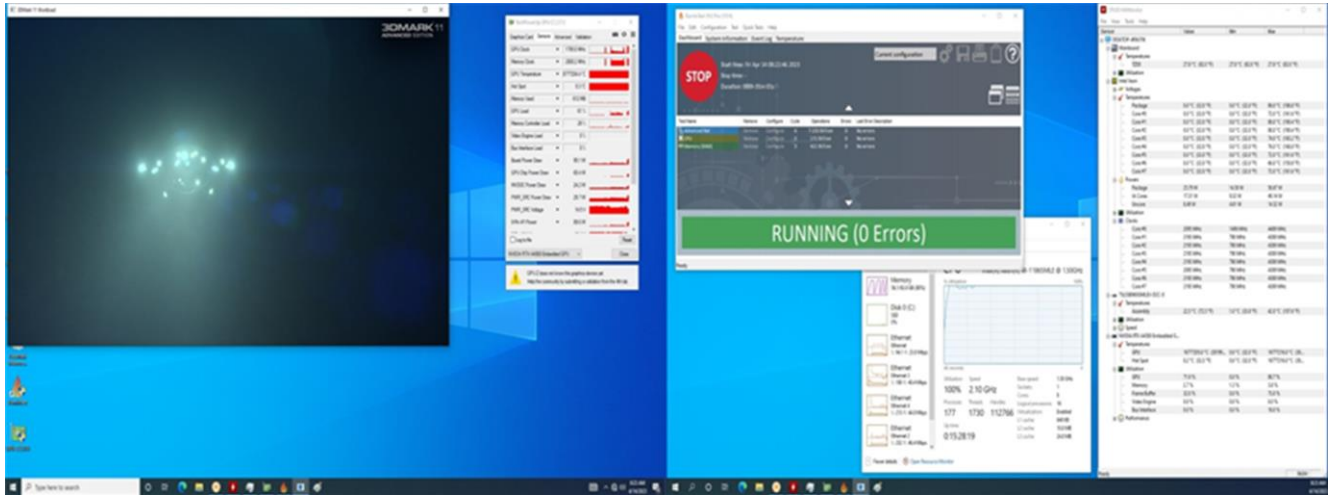
TEST POINT NO.	Test Point
1	CPU
2	PCH
3	DRAM
4	CPU HEATSINK
5	GPU
6	GPU RAM
7	GPU HEATSINK
8	SSD
9	POWER
10	LAN
11	LAN HEATSINK

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4. TEST PHOTO IN LAB

- Chamber in -40°C



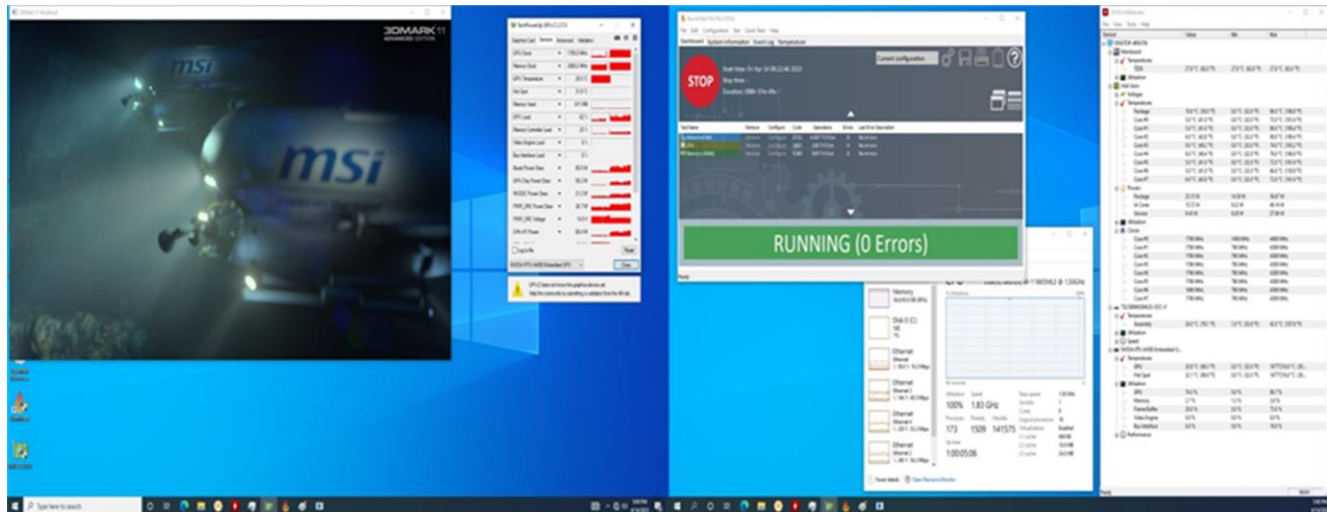
Test Point	Ambient Temp.	-40°C
1	CPU	-23.5
2	PCH	-25.8
3	DRAM	-17.9
4	CPU HEATSINK	-29.5
5	GPU	-19.7
6	GPU RAM	-27.9
7	GPU HEATSINK	-30
8	SSD	-37.3
9	POWER	-32.1
10	LAN	-31.1
11	LAN HEATSINK	-35.2



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- Chamber in -20°C



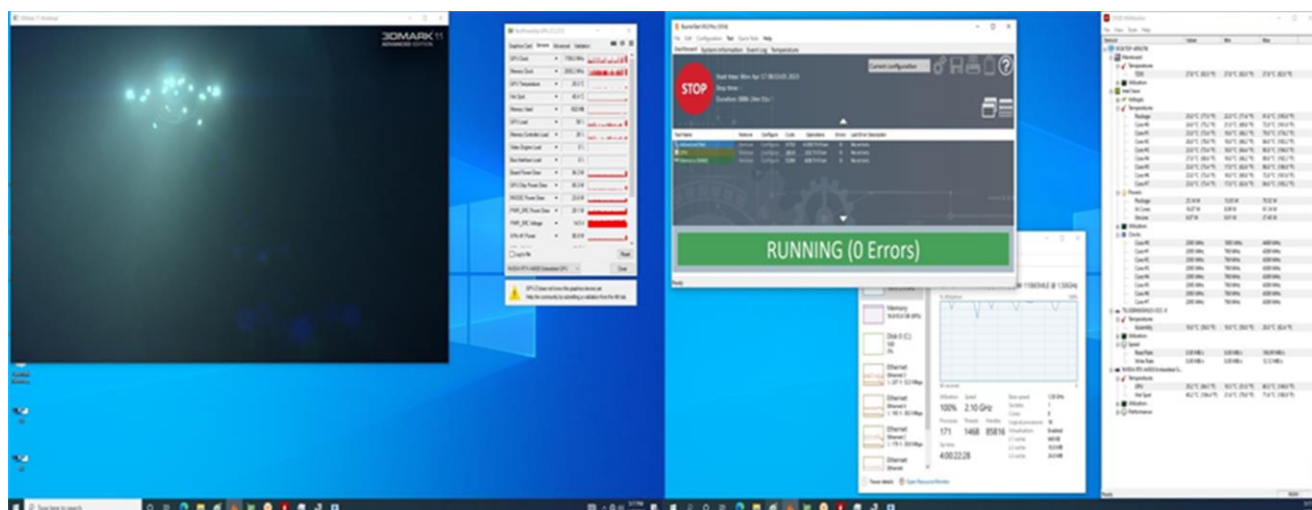
总览				
2023/04/14 17:30:34				
1	7	13	19	
-1.8	-0.2	-Over	-Over	
2	8	14	20	
-3.9	-15.0	-Over	-Over	
3	9	15	21	
5.1	-10.9	-Over	-Over	
4	10	16	22	
-8.5	-9.9	-Over	-Over	
5	11	17	23	
22.6	-14.1	-Over	-Over	
6	12	18	24	
2.6	-Over	-Over	-Over	

Test Point	Ambient Temp.	-20°C
1	CPU	-1.8
2	PCH	-9
3	DRAM	5.1
4	CPU HEATSINK	-8.5
5	GPU	22.6
6	GPU RAM	2.6
7	GPU HEATSINK	-0.2
8	SSD	-15
9	POWER	-10.9
10	LAN	-9.9
11	LAN HEATSINK	-14.1

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- Chamber in 0°C



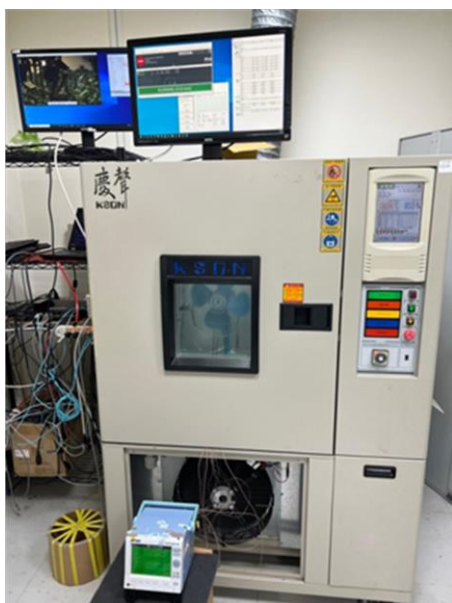
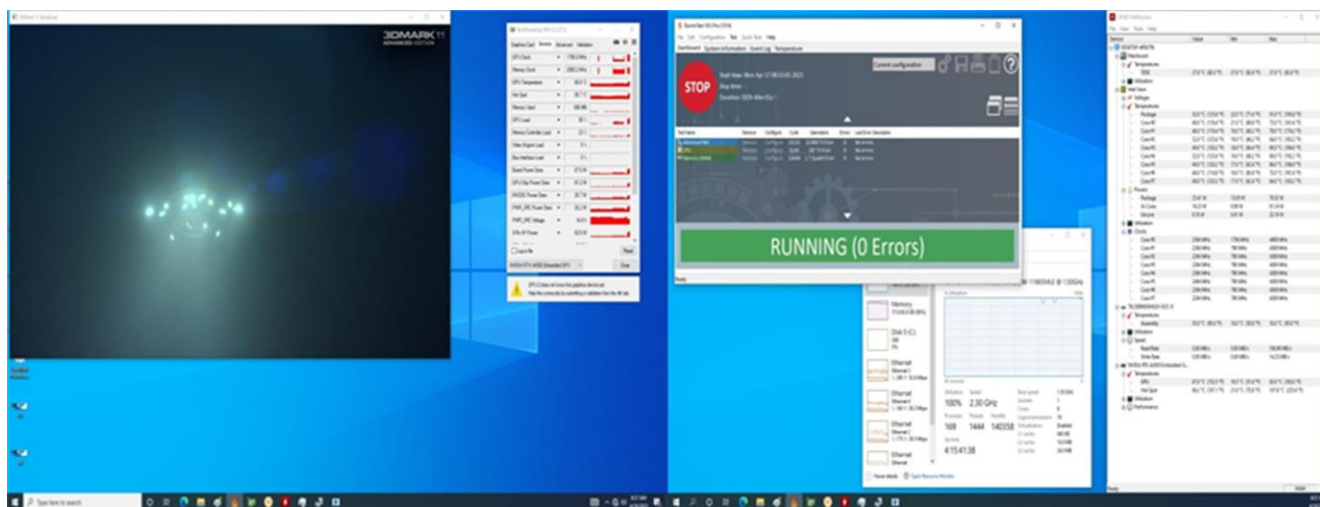
Test Point	Ambient Temp.	0°C
1	CPU	15.7
2	PCH	12.5
3	DRAM	21.8
4	CPU HEATSINK	9.7
5	GPU	18.9
6	GPU RAM	10.8
7	GPU HEATSINK	10.3
8	SSD	6.9
9	POWER	9.4
10	LAN	10.7
11	LAN HEATSINK	6.3

1	15.7	7	10.3	13	-Over	19	-Over
2	12.5	8	6.9	14	-Over	20	-Over
3	21.8	9	9.4	15	-Over	21	-Over
4	9.7	10	10.7	16	-Over	22	-Over
5	18.9	11	6.3	17	-Over	23	-Over
6	10.8	12	473.6	18	-Over	24	-Over

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- Chamber in 25°C



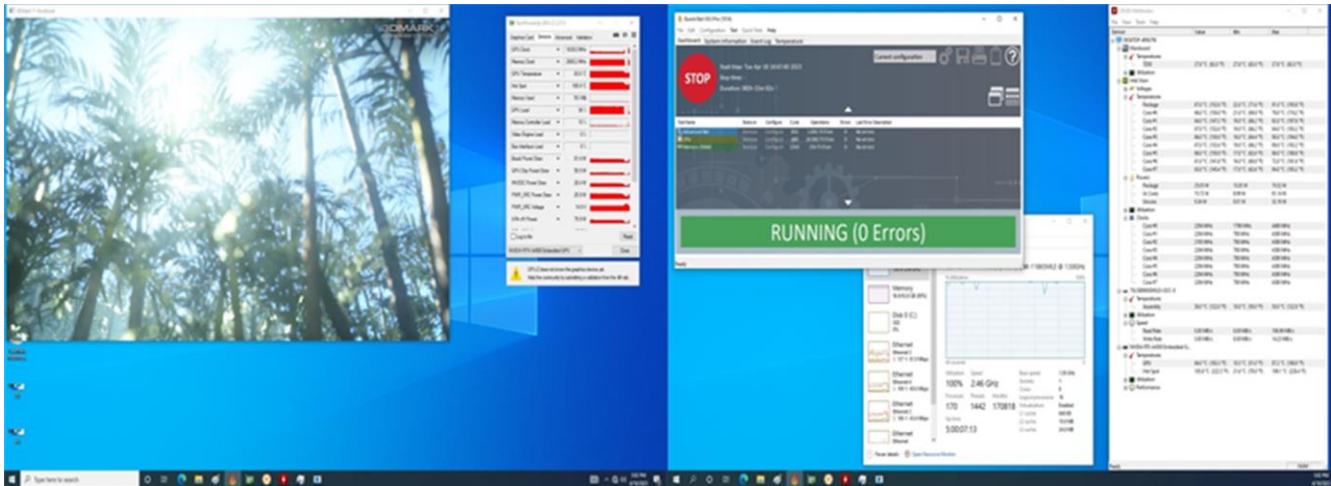
Test Point	Ambient Temp.	25°C
1	CPU	42.4
2	PCH	40.4
3	DRAM	47.3
4	CPU HEATSINK	35.9
5	GPU	46.1
6	GPU RAM	39.5
7	GPU HEATSINK	38.3
8	SSD	33.6
9	POWER	35.6
10	LAN	37.7
11	LAN HEATSINK	32.1



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- Chamber in 40°C



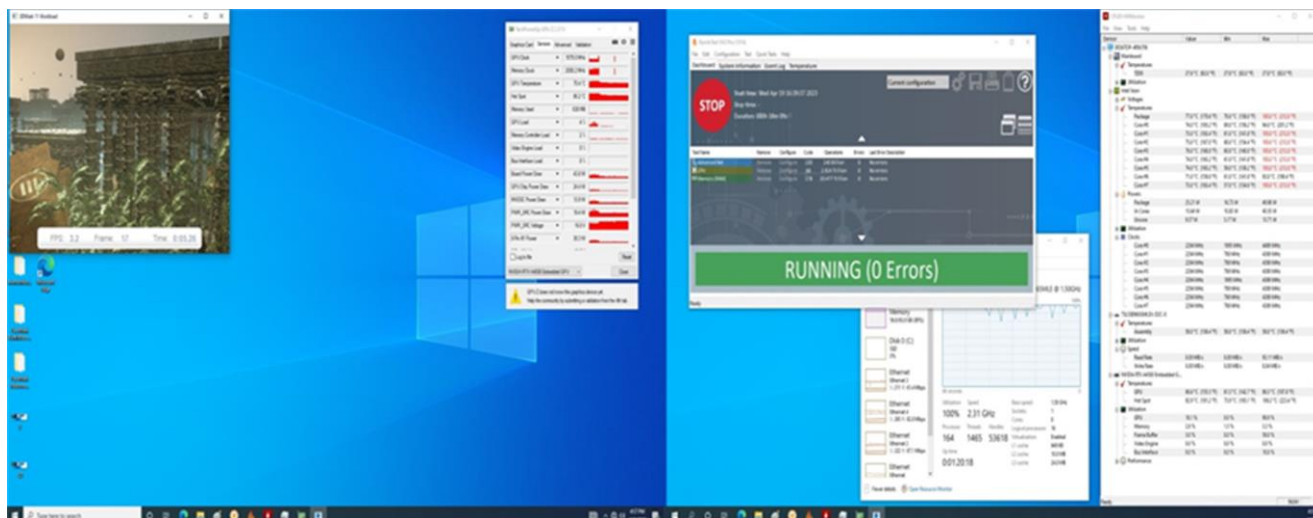
Test Point	Ambient Temp.	40°C
1	CPU	57.2
2	PCH	55.3
3	DRAM	61.1
4	CPU HEATSINK	50.4
5	GPU	71.2
6	GPU RAM	59.1
7	GPU HEATSINK	55.9
8	SSD	47.8
9	POWER	50.5
10	LAN	52.6
11	LAN HEATSINK	47



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- Chamber in 50°C



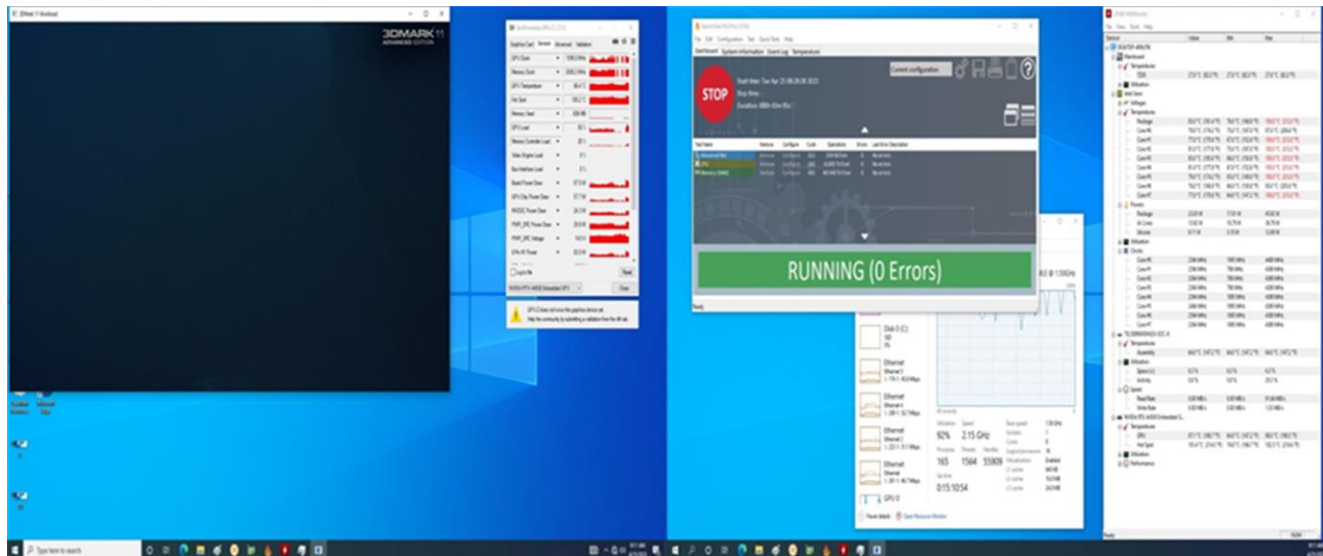
Test Point	Ambient Temp.	50°C
1	CPU	65.8
2	PCH	62.5
3	DRAM	68.6
4	CPU HEATSINK	59.3
5	GPU	69.1
6	GPU RAM	64
7	GPU HEATSINK	62.2
8	SSD	54.8
9	POWER	58.7
10	LAN	60.9
11	LAN HEATSINK	55.4

A close-up photograph of the test chamber's internal display. The display shows a grid of 24 test points, each with a temperature reading and a status indicator (e.g., '1 65.8', '2 62.5', '3 68.8', etc.). The status indicators for most points are '-over'.

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- Chamber in 55°C



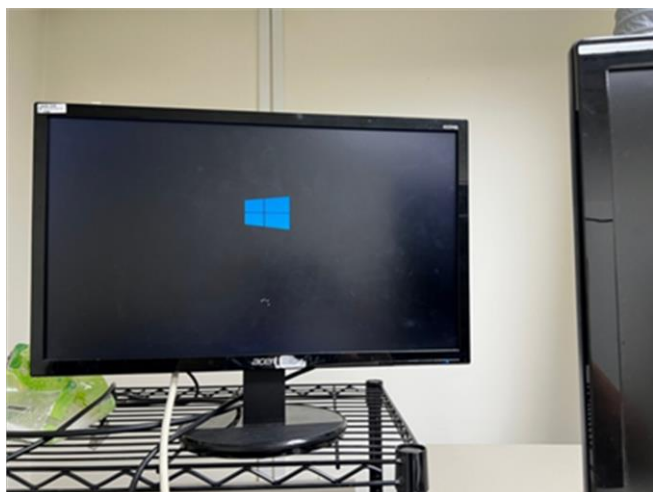
Test Point	Ambient Temp.	50°C
1	CPU	71.2
2	PCH	68.9
3	DRAM	69.1
4	CPU HEATSINK	65.5
5	GPU	95.3
6	GPU RAM	68.3
7	GPU HEATSINK	67
8	SSD	61.4
9	POWER	65.2
10	LAN	72.2
11	LAN HEATSINK	62.2

1	71.2	7	67.0	13	-Over	19	-Over
2	68.9	8	61.4	14	-92.1	20	-Over
3	69.1	9	65.2	15	-42.0	21	38.1
4	65.5	10	72.2	16	-Over	22	-175.0
5	95.3	11	62.2	17	-123.7	23	62.2
6	68.3	12	60.1	18	48.1	24	62.7

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Low Temperature SYSTEM Boot up Test - Ambient Temp. -40°C



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5. HORUS430-X1A THERMAL TEST RESULT (-40~+55 DEGREE)

TEST POINT NO.	Test Point	Ambient Temp						
		-40° C	-20° C	0° C	25° C	40° C	50° C	55° C
1	CPU	-23.5	-1.8	15.7	42.4	57.2	65.8	71.2
2	PCH	-25.8	-9	12.5	40.4	55.3	62.5	68.9
3	DRAM	-17.9	5.1	21.8	47.3	61.1	68.6	69.1
4	CPU HEATSINK	-29.5	-8.5	9.7	35.9	50.4	59.3	65.5
5	GPU	-19.7	22.6	18.9	46.1	71.2	69.1	95.3
6	GPU RAM	-27.9	2.6	10.8	39.5	59.1	64	68.3
7	GPU HEATSINK	-30	-0.2	10.3	38.3	55.9	62.2	67
8	SSD	-37.3	-15	6.9	33.6	47.8	54.8	61.4
9	POWER	-32.1	-10.9	9.4	35.6	50.5	58.7	65.2
10	LAN	-31.1	-9.9	10.7	37.7	52.6	60.9	72.2
11	LAN HEATSINK	-35.2	-14.1	6.3	32.1	47	55.4	62.2
	CPU TJ	0	10	25	52	67	77	83
	CPU FRQ	2.46GHz	2.46GHz	2.46GHz	2.31GHz	2.46GHz	2.31GHz	2.15GHz
	GPU TJ	0	20	29.3	66.8	83.6	70.4	86.4
	GPU (MHZ)	1785MHz	1785MHz	1785MHz	1785MHz	1635MHz	1575MHz	1395MHz

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6. I/O FUNCTION TEST

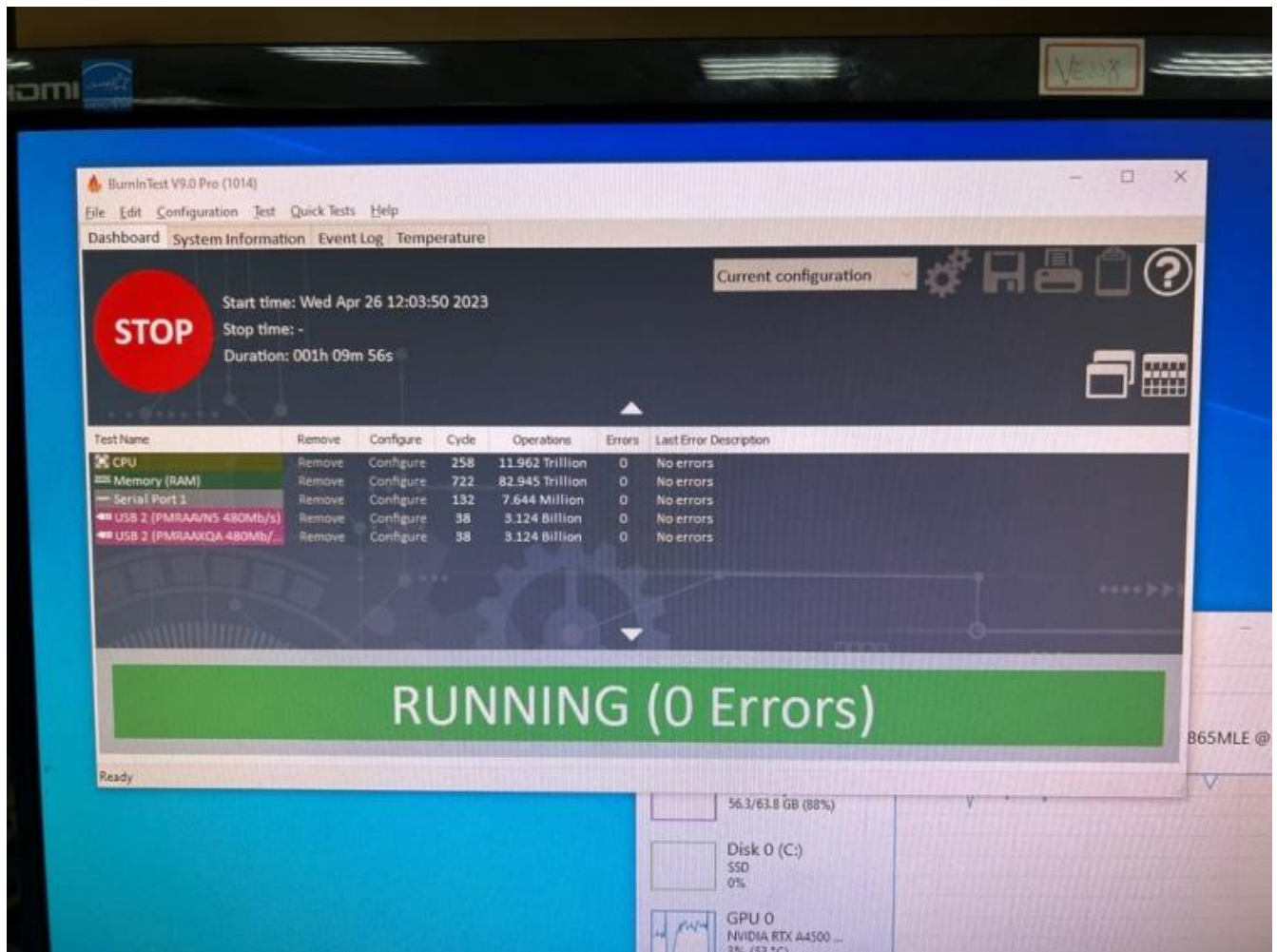
6.1 DVI/DVI OUTPUT TEST



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6.2 USB /COM Data Test



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6.3 LAN Data Test

