



# Thermal & Functions Test Report

## ***THOR200-015***



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# Thermal & Functions Test Report

THOR200-D15

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## 1. SYSTEM SPEC

### 1-1. PRODUCT PHOTOS



### 1-2. SYSTEM COFIGURATION

System Configuration	
<b>Motherboard</b>	SK515
<b>CPU</b>	Intel Xeon Processor D-1577 COM Express Basic Module Type 7 Module
<b>Memory</b>	TEAMGROUP SO-DIMM 32GB DDR4 2666 Mbps*1
<b>SSD</b>	2.5" SATA 1920GB TLC SSD (7SLSSB1K9GMLEX-I2C-8), -40~85°C, RoHS *2
<b>GPU</b>	ZRT-Tech Nvidia Quadro A2000m

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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 Procedure	<ol style="list-style-type: none"><li>1. Thermal pre-scan measurement: Temperature: -40~60°C/85%RH</li><li>2. Thermal actual measurement:<ol style="list-style-type: none"><li>a. Select the test points according to the IR photo and attach thermocouples to the hot points</li><li>b. Put the EUT in thermal chamber and set the temperature profile of as test specification</li><li>c. Turn on the thermal chamber and power on the EUT to enter windows environment to run Max Power Test + 3DMARK 2003 application program</li><li>d. After the EUT executing the test software for 4 hours, record thermal maximum value for each thermocouples point.</li><li>e. Turn off the thermal chamber and EUT</li><li>f. Verify and check recorded figure of each components to its' operating temperature range listed in specification/approval sheet of each measured component</li></ol></li></ol>																										
Test diagram of curves	<p>The graph illustrates the thermal profile over a 27-hour period. The temperature starts at 25°C at 0.5 hours, drops to -40°C at 4.5 hours, rises to -20°C at 5 hours, and then to 40°C at 14 hours. A red line indicates the testing period from 13.5 hours to 27 hours. The temperature continues to rise to 60°C at 23 hours and remains constant until 27 hours.</p> <table border="1"><thead><tr><th>Time (hour)</th><th>Temperature (°C)</th></tr></thead><tbody><tr><td>0.5</td><td>25</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>-20</td></tr><tr><td>13.5</td><td>-20</td></tr><tr><td>14</td><td>40</td></tr><tr><td>18</td><td>40</td></tr><tr><td>18.5</td><td>40</td></tr><tr><td>22.5</td><td>50</td></tr><tr><td>23</td><td>60</td></tr><tr><td>27</td><td>60</td></tr></tbody></table>	Time (hour)	Temperature (°C)	0.5	25	4.5	-40	5	-20	9	-20	9.5	-20	13.5	-20	14	40	18	40	18.5	40	22.5	50	23	60	27	60
Time (hour)	Temperature (°C)																										
0.5	25																										
4.5	-40																										
5	-20																										
9	-20																										
9.5	-20																										
13.5	-20																										
14	40																										
18	40																										
18.5	40																										
22.5	50																										
23	60																										
27	60																										

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### 2.2. THOR200-D15 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°C	PASS
-20°C	PASS
0°C	PASS
40°C	PASS
50°C	PASS
60°C	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
USB3.0 *1	USB3.0 can use any USB device	PASS
	Loopback Plugs for USB 3.0 Trouble shooting and Testing	
USB2.0 *4	USB2.0 can use any USB device	PASS
	Loopback Plugs for USB 2.0 Trouble shooting and Testing	
DVI/VGA	Check work well	PASS
COM*2	Check work well	PASS
LAN*2	Check work well	PASS

#### 2.2.3 LOW-TEMP. BOOT-UP

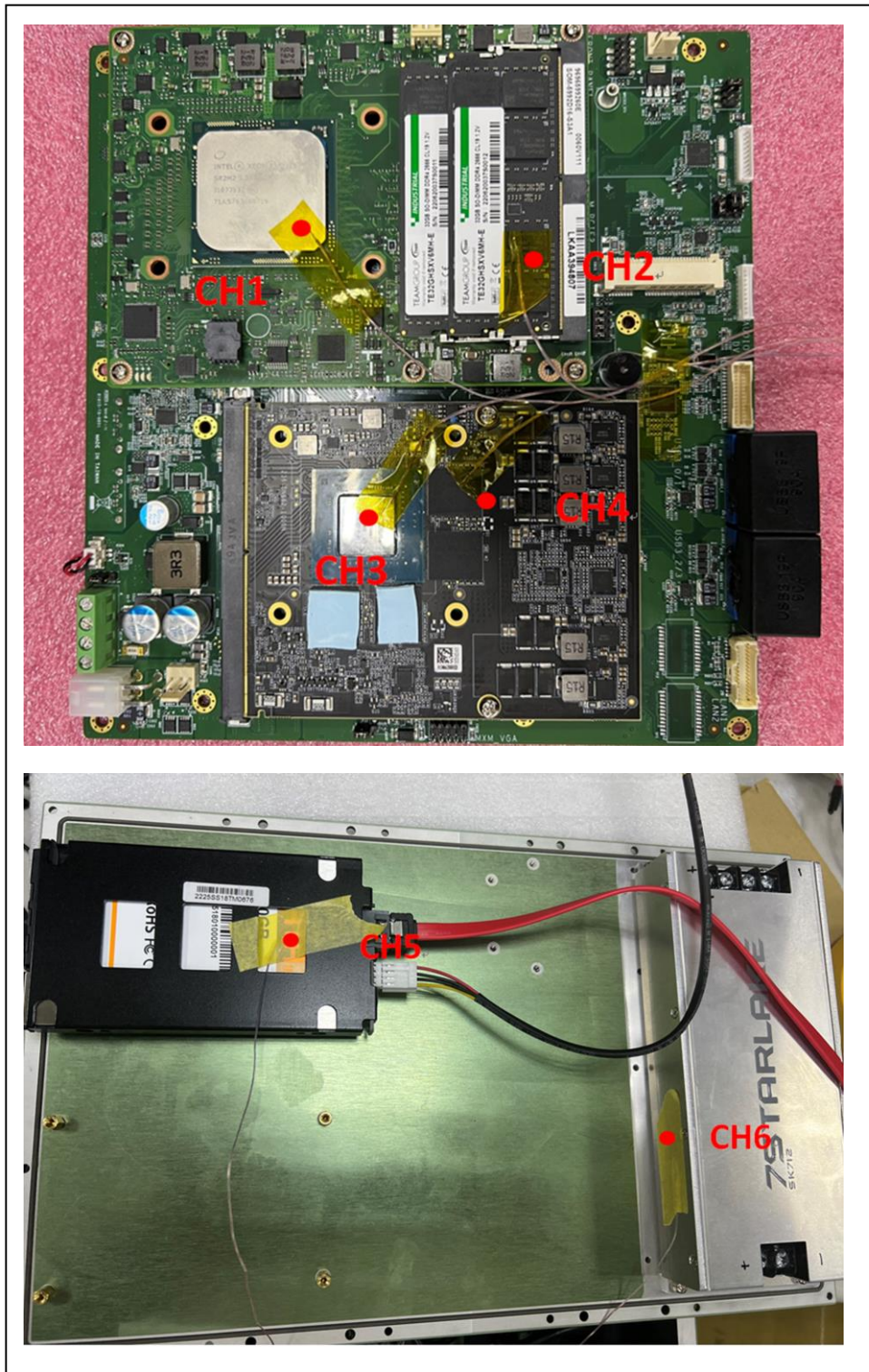
#Power supply under -40°C and ensure that the system boot up properly

Ambient Temp.	Test Result
-40°C	PASS

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## 3. THERMAL TEST POINT



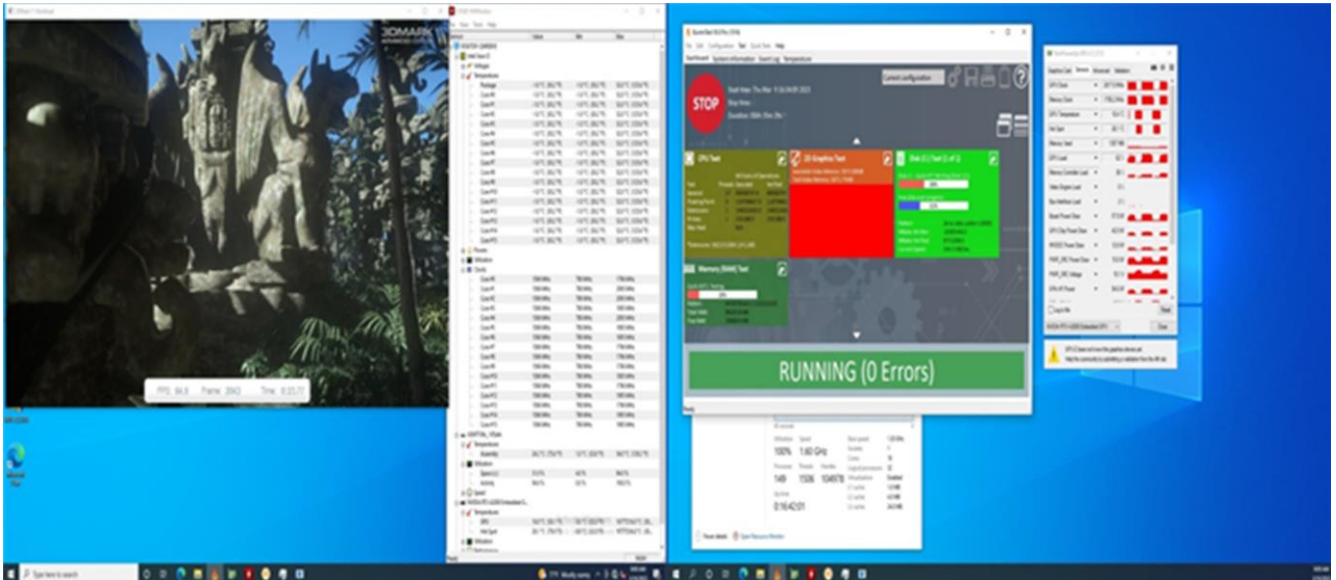
TEST POINT NO.	Test Point
1	CPU
2	DRAM
3	GPU
4	GPU RAM
5	SSD
6	POWER

# Thermal & Functions Test Report

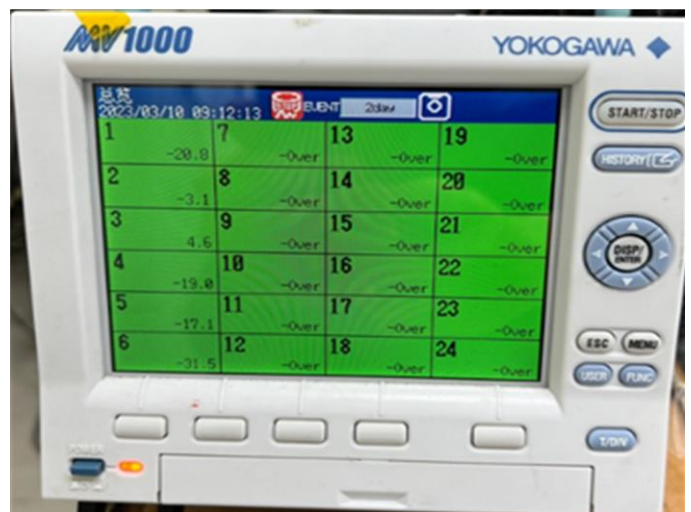
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## 4. TEST PHOTO IN LAB

- Chamber in -40°C



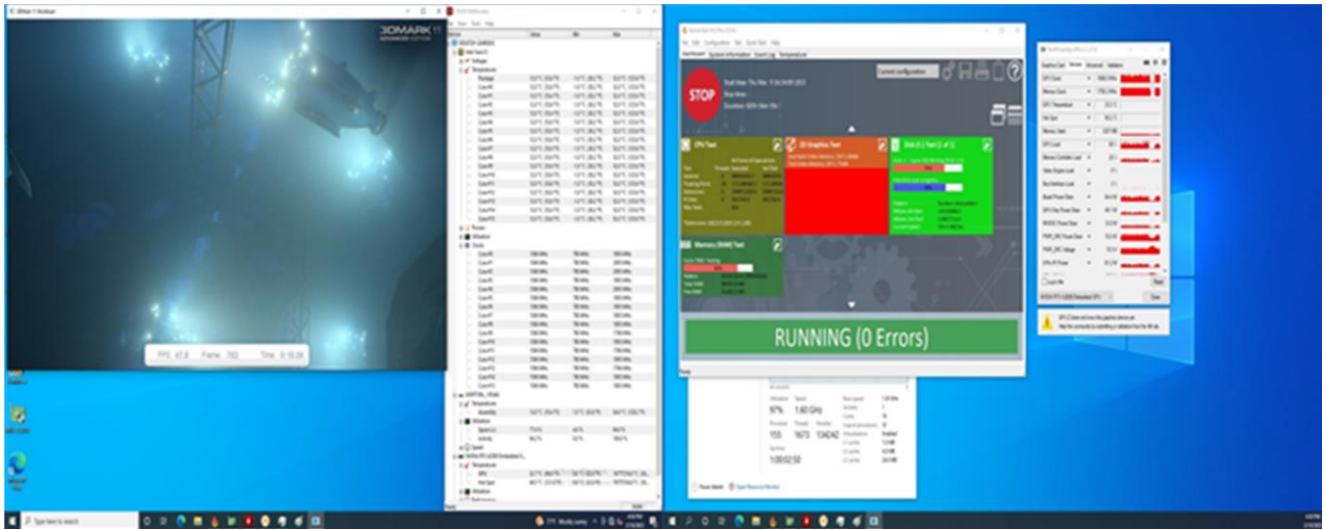
Test Point	Ambient Temp.	-40°C
1	CPU	-20.8
2	DRAM	-3.1
3	GPU	4.6
4	GPU RAM	-19
5	SSD	-17.1
6	POWER	-31.5



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### - Chamber in -20°C



Test Point	Ambient Temp.	-20°C
1	<b>CPU</b>	2.3
2	<b>DRAM</b>	18.9
3	<b>GPU</b>	24.2
4	<b>GPU RAM</b>	2.8
5	<b>SSD</b>	6.9
6	<b>POWER</b>	-10

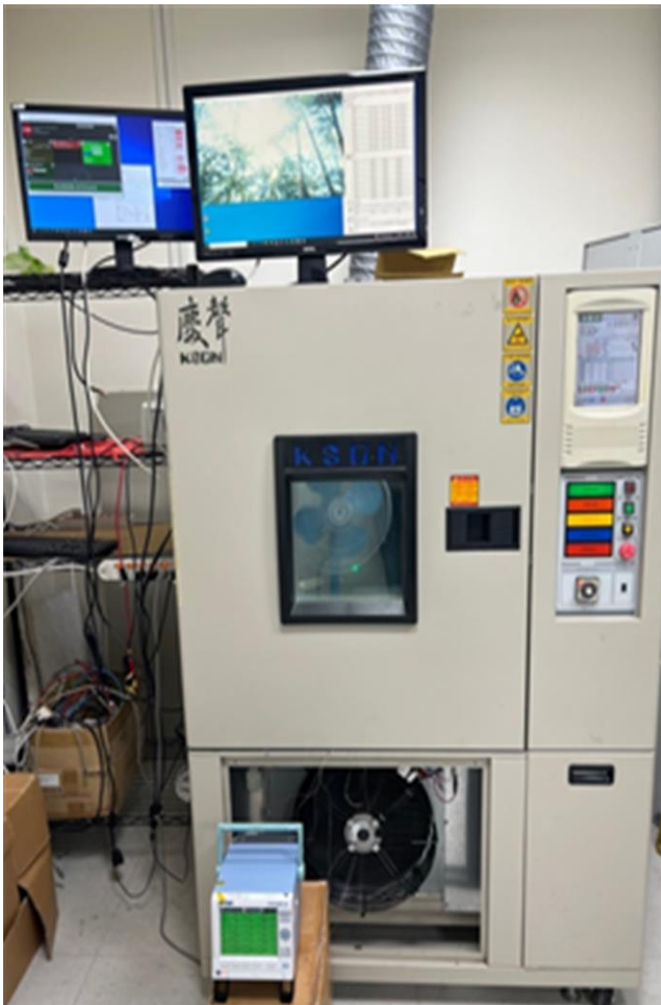
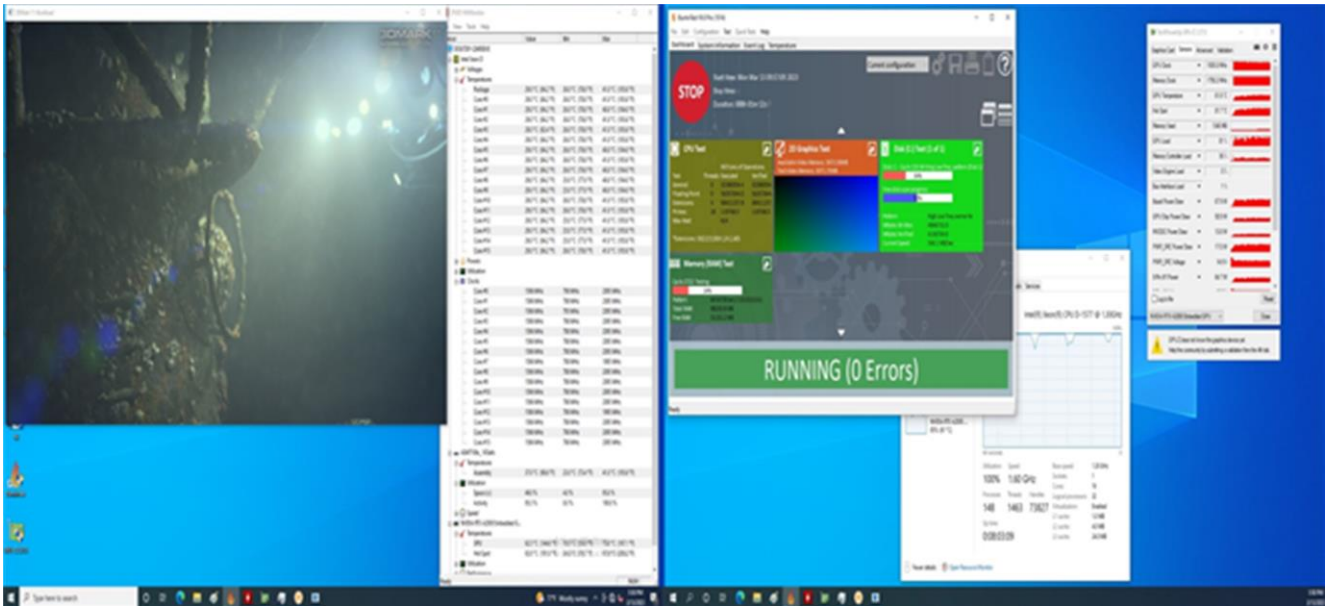




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### - Chamber in 0°C



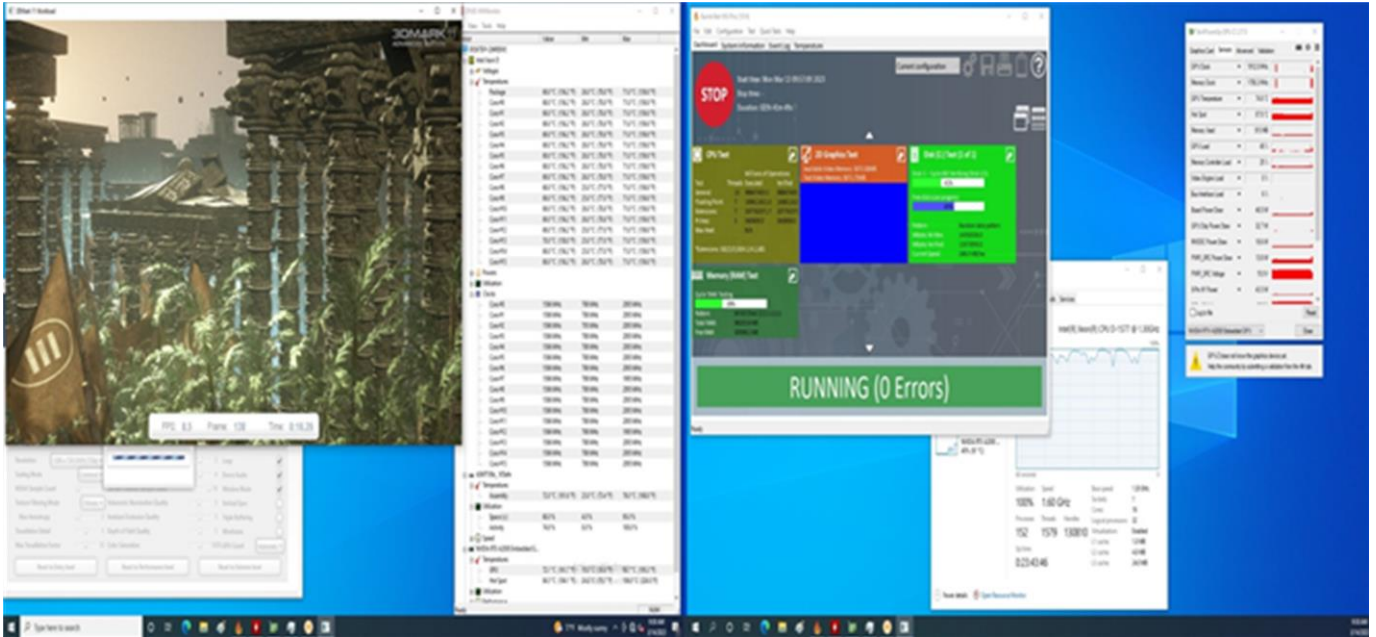
Test Point	Ambient Temp.	0°C
1	<b>CPU</b>	18.0
2	<b>DRAM</b>	35.6
3	<b>GPU</b>	41.1
4	<b>GPU RAM</b>	19.3
5	<b>SSD</b>	28.9
6	<b>POWER</b>	10.1



# Thermal & Functions Test Report

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### - Chamber in 40°C



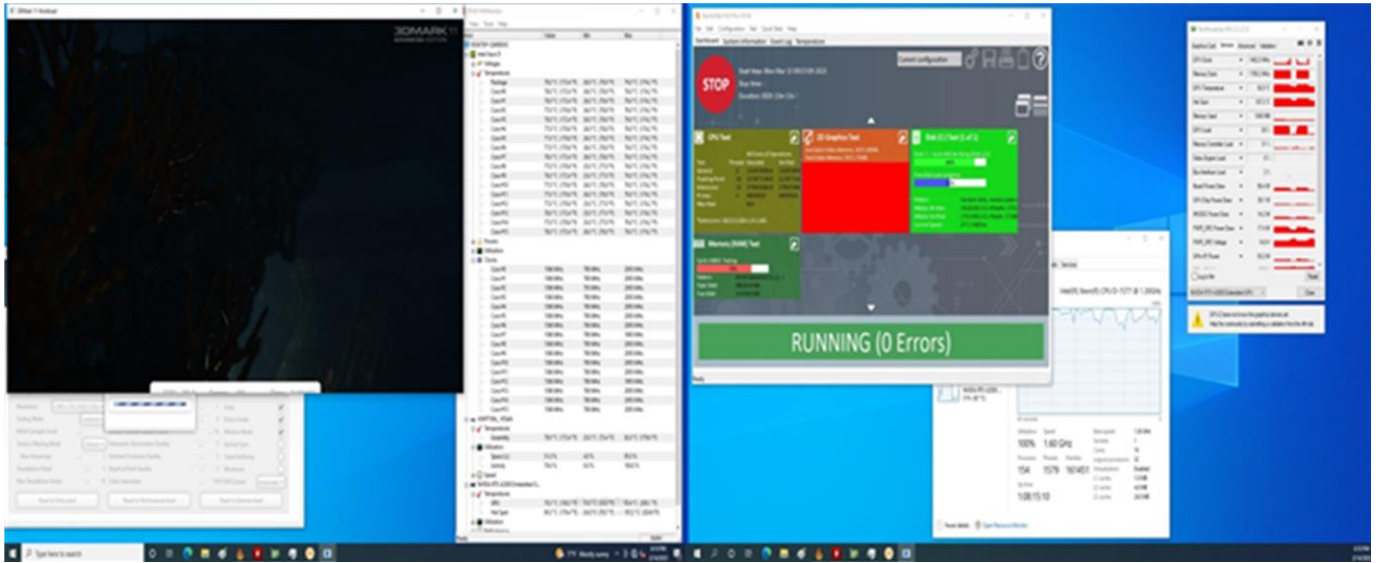
Test Point	Ambient Temp.	40°C
1	<b>CPU</b>	58.35
2	<b>DRAM</b>	75.7
3	<b>GPU</b>	73.3
4	<b>GPU RAM</b>	58
5	<b>SSD</b>	67.2
6	<b>POWER</b>	50.2



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### - Chamber in 50°C



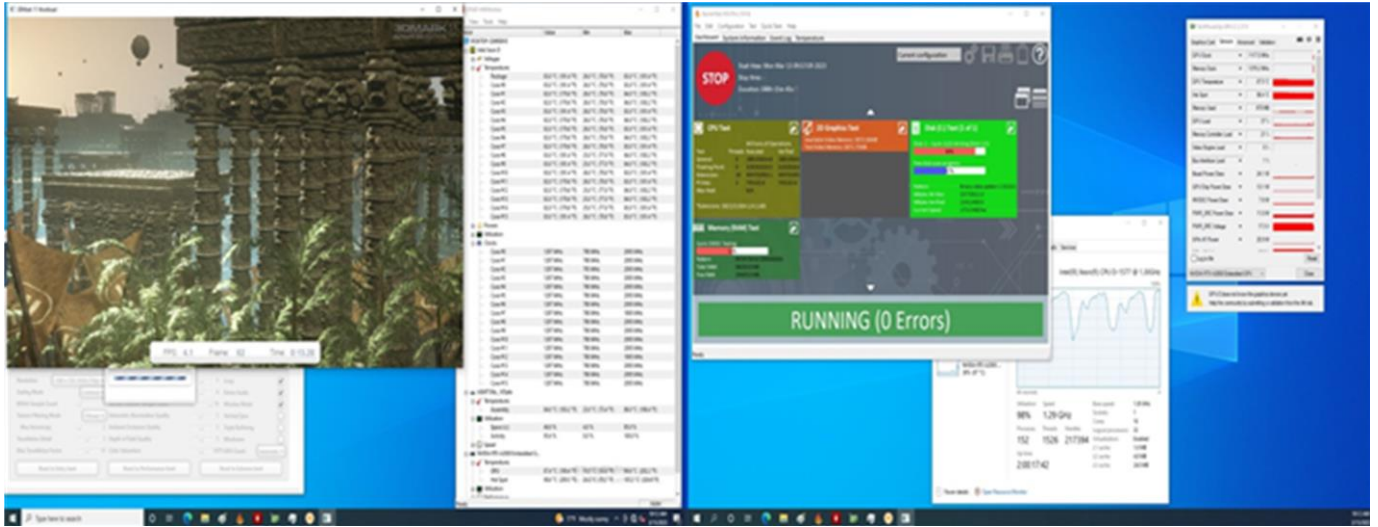
Test Point	Ambient Temp.	50°C
1	<b>CPU</b>	67.6
2	<b>DRAM</b>	85.4
3	<b>GPU</b>	68
4	<b>GPU RAM</b>	65.8
5	<b>SSD</b>	77
6	<b>POWER</b>	59.9



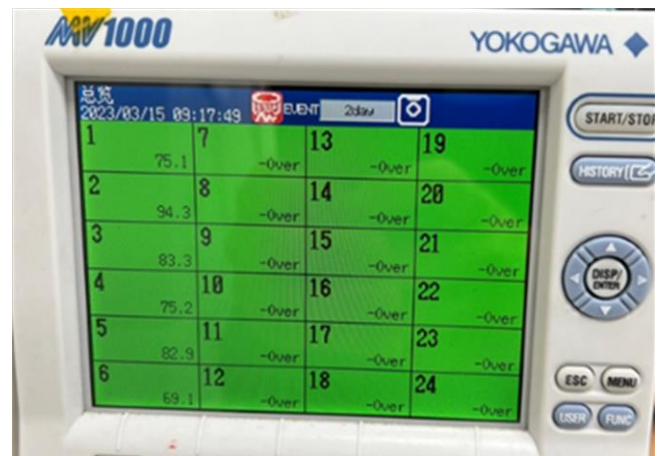
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## - Chamber in 60°C



Test Point	Ambient Temp.	60°C
1	CPU	75.1
2	DRAM	94.3
3	GPU	83.3
4	GPU RAM	75.2
5	SSD	82.9
6	POWER	69.1



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## 5. THOR200-X11 THERMAL TEST RESULT (-40~+60 DEGREE)

TEST POINT NO.	Test Point	Ambient Temp					
		-40° C	-20° c	0° c	40° C	50° C	60° C
1	CPU	-20.8	2.3	18	58.3	67.6	75.1
2	DRAM	-3.1	18.9	35.6	75.7	85.7	94.3
3	GPU	4.6	24.2	41.1	73.3	68	83.3
4	GPU RAM	-19	2.8	19.3	58	65.8	75.2
5	SSD	-17.1	6.9	28.9	67.2	77	82.9
6	POWER	-31.5	-10	10.1	50.2	59.9	69.1
	CPU TJ	-1	12	29	69	78	83
	CPU FRQ	1.6GHz	1.6GHz	1.6GHz	1.6GHz	1.6GHz	1.29GHz
	GPU TJ	10	32.7	61.8	74.8	92.8	87.5
	GPU (MHZ)	2017MHZ	1980MHZ	1935MHZ	1912MHZ	1462MHZ	1117MHZ

# Thermal & Functions Test Report

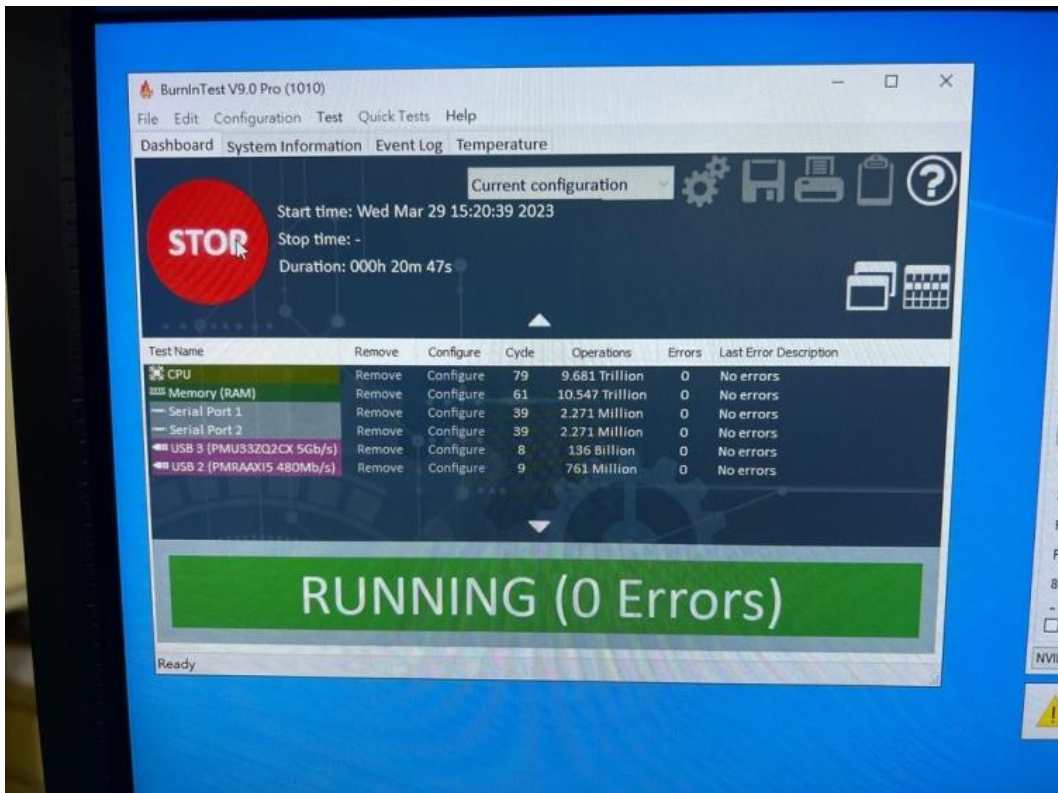
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## 6. I/O FUNCTION TEST

### 6.1 DVI/DVI Test



### 6.2 USB3.0 Test



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## 6.3 LAN/COM Port Test

The screenshot displays the BurnInTest V9.0 Pro software interface. At the top, there is a menu bar with 'File', 'Edit', 'Configuration', 'Test', 'Quick Tests', and 'Help'. Below the menu bar, there are tabs for 'Dashboard', 'System Information', 'Event Log', and 'Temperature'. The main dashboard area features a large red 'STOP' button on the left and a 'Current configuration' section on the right. The 'Current configuration' section shows 'Start time: Mon Mar 27 03:19:39 2023', 'Stop time: -', and 'Duration: 024h 02m 39s'. Below this, there is a table with the following columns: 'Test Name', 'Remove', 'Configure', 'Cycle', 'Operations', 'Errors', and 'Last Error Description'. The table contains the following data:

Test Name	Remove	Configure	Cycle	Operations	Errors	Last Error Description
Advanced Net	Remove	Configure	10735	11.524 Trillion	0	No errors
CPU	Remove	Configure	5537	665 Trillion	0	No errors
Memory (RAM)	Remove	Configure	5078	877 Trillion	0	No errors
Serial Port 1	Remove	Configure	2746	158 Million	0	No errors
Serial Port 2	Remove	Configure	2746	158 Million	0	No errors

At the bottom of the dashboard, there is a large green banner that reads 'RUNNING (0 Errors)'. The status bar at the very bottom of the window shows 'Ready'.