



IV320CH-TX

Thermal TEST REPORT

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Test Report

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1. SYSTEM SPEC

1-1. PRODUCT PHOTOS



1-2. SYSTEM COFIGURATION

System Configuration	
Motherboard	SK515
CPU	Advantech SOM-5899RC7Q-U7A1
Memory	DSL DDR4 2400 8GB
SSD	Phison 7STARLAKE 7SLSSB128GMLEX-SBC-2
GPU	NVIDIA RTX1050Ti
X1	USB2.0 x2
X2	Intel® I219LM Gigabit LAN x2
X3	DP
X4-X5	COM
X6	Audio
X7	DIO

2. Test Plan

2-1. Thermal Measurement Process

<p>Test Purpose</p>	<p>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</p>																														
<p>Test Equipment</p>	<p>1. KSON THS-B4T-150 Chamber 2. YOKOGAWA MV1000, Thermometer (FLUKE50D K/J)</p>																														
<p>Quantity Tested</p>	<p>Minimum 1 Set</p>																														
<p>Test Software</p>	<p>Passmark Burn-In Test under Windows 10</p>																														
<p>Test Procecedure</p>	<ol style="list-style-type: none"> 1. Thermal pre-scan measurement: Temperature: -20~60°C /60%RH 2. Thermal actual measurement: <ol style="list-style-type: none"> 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 2003 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 																														
<p>Test diagram of curves</p>	<p>Environment defines for 8 hours</p> <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 - 1.5</td><td>25</td></tr> <tr><td>1.5 - 2</td><td>25</td></tr> <tr><td>2 - 6</td><td>-20</td></tr> <tr><td>6 - 6.5</td><td>-20</td></tr> <tr><td>6.5 - 10.5</td><td>10.5</td></tr> <tr><td>10.5 - 11</td><td>10.5</td></tr> <tr><td>11 - 15</td><td>40</td></tr> <tr><td>15 - 15.5</td><td>40</td></tr> <tr><td>15.5 - 19.5</td><td>50</td></tr> <tr><td>19.5 - 20</td><td>50</td></tr> <tr><td>20 - 24</td><td>60</td></tr> <tr><td>24 - 24.5</td><td>60</td></tr> <tr><td>24.5 - 25</td><td>25</td></tr> <tr><td>25 - 26</td><td>25</td></tr> </tbody> </table>	Time (hour)	Temperature (°C)	0 - 1.5	25	1.5 - 2	25	2 - 6	-20	6 - 6.5	-20	6.5 - 10.5	10.5	10.5 - 11	10.5	11 - 15	40	15 - 15.5	40	15.5 - 19.5	50	19.5 - 20	50	20 - 24	60	24 - 24.5	60	24.5 - 25	25	25 - 26	25
Time (hour)	Temperature (°C)																														
0 - 1.5	25																														
1.5 - 2	25																														
2 - 6	-20																														
6 - 6.5	-20																														
6.5 - 10.5	10.5																														
10.5 - 11	10.5																														
11 - 15	40																														
15 - 15.5	40																														
15.5 - 19.5	50																														
19.5 - 20	50																														
20 - 24	60																														
24 - 24.5	60																														
24.5 - 25	25																														
25 - 26	25																														

2-2. IV320CH-TX 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 LOW-TEMP. BOOT-UP

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

Ambient Temp.	Test Result
-40°C	PASS

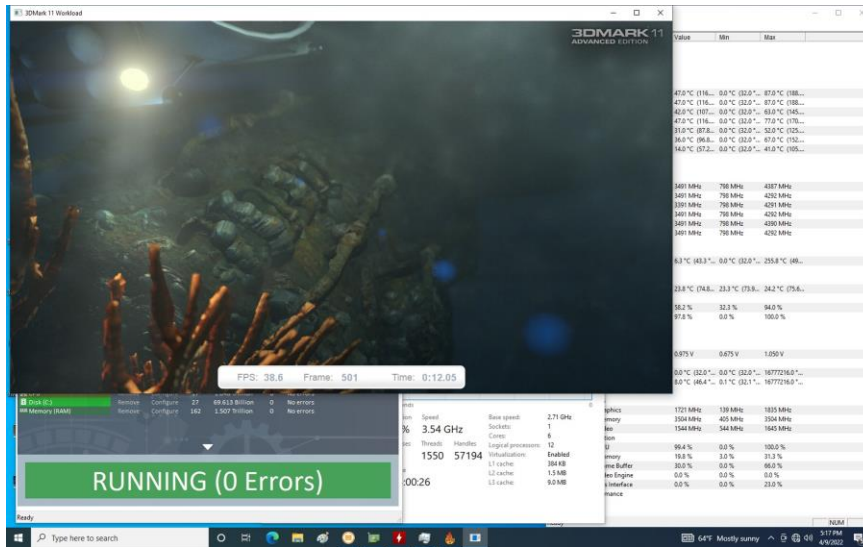
3 Thermal Test Point



TEST POINT NO.	Test Point
1	CPU
2	PCH
4	CPU Heatsink
5	GPU
6	GPU Heatsink
7	SSD

4 Test Photo in LAB

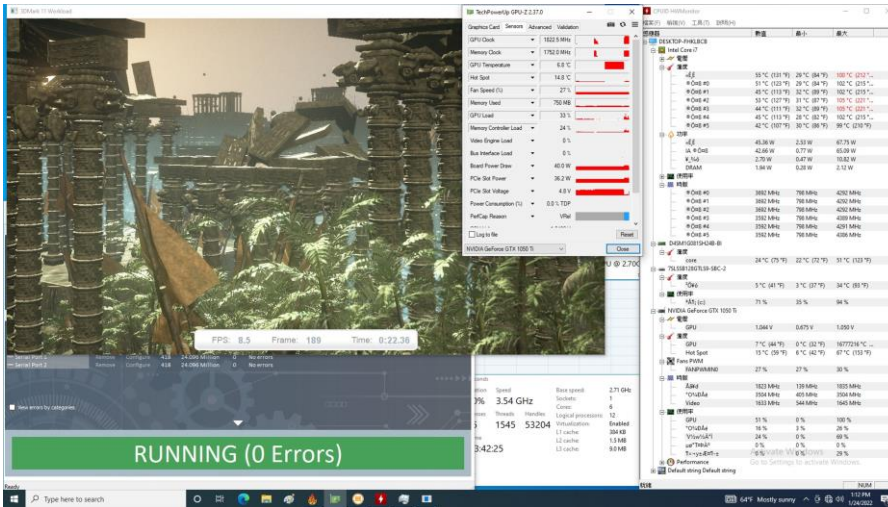
- Chamber in -40°C



Test Point	Ambient Temp.	-40° C
CPU		18.8
PCH		-4.5
CPU Heatsink		-6.3
GPU		4.9
GPU Heatsink		-8
SSD		-22.6



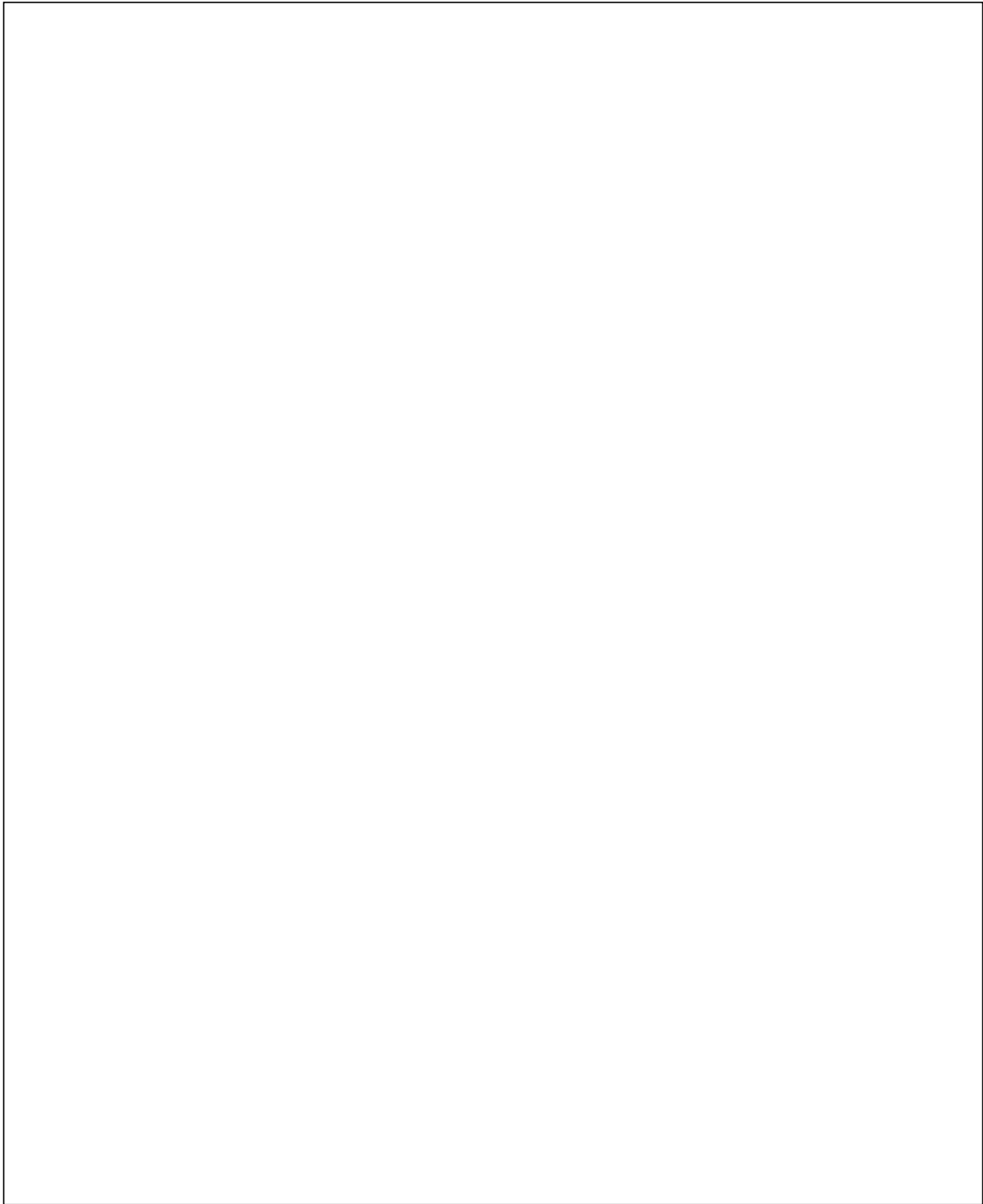
- Chamber in -20°C

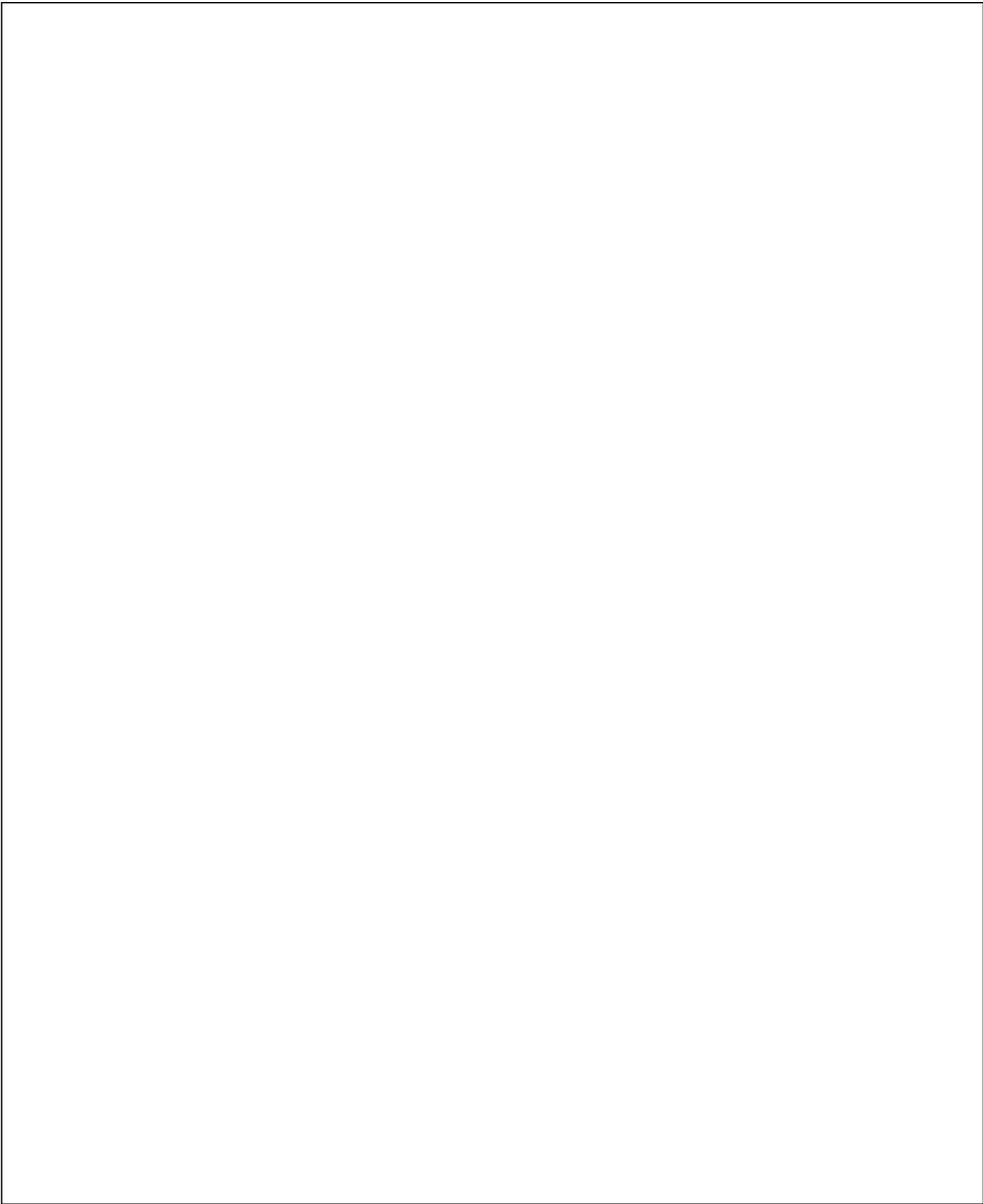


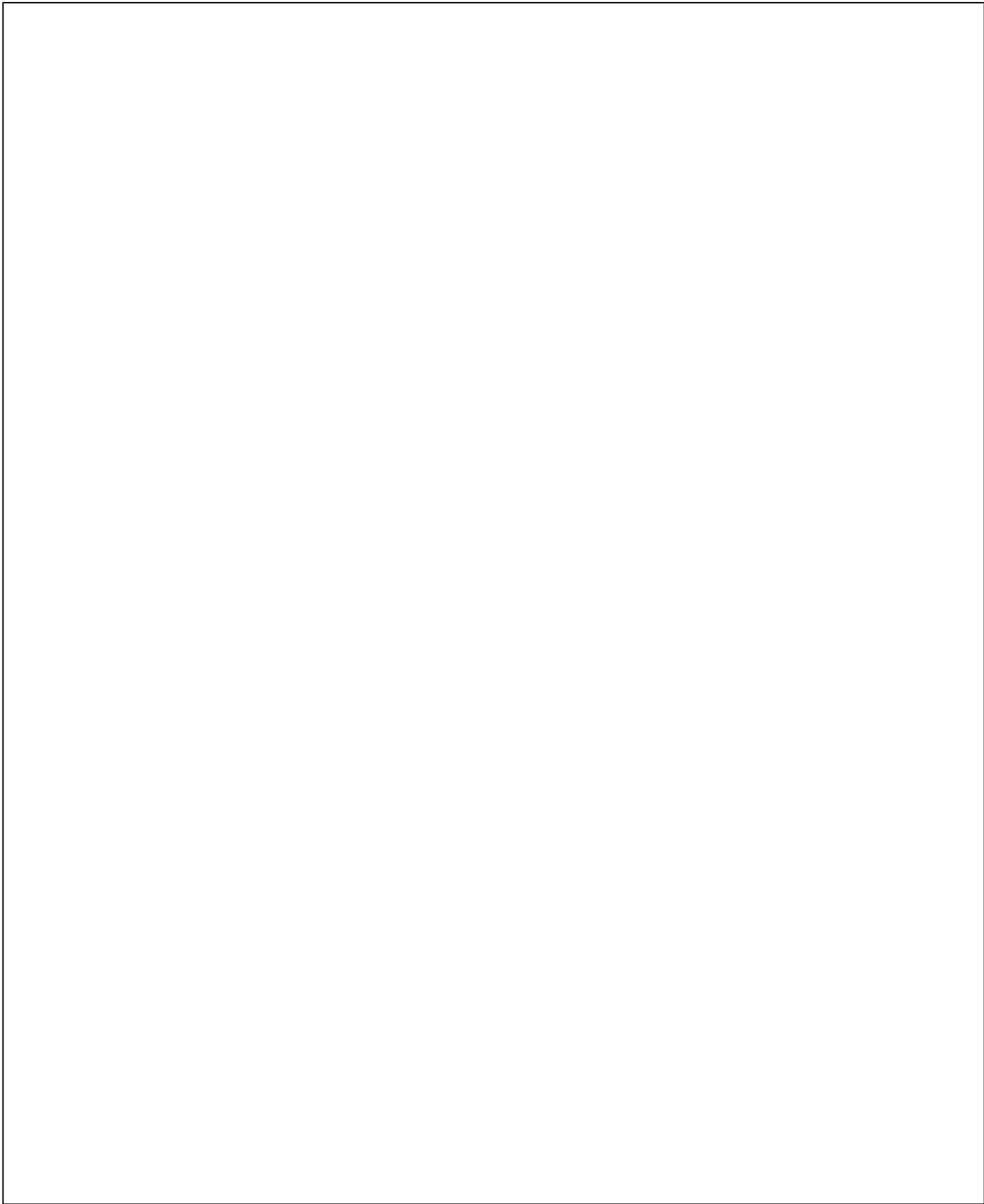
TEST POINT NO.	Test Point	Ambient Temp. -20° C
1	CPU	28.8
2	PCH	7.2
4	CPU Heatsink	-2.1
5	GPU	26.4
6	GPU Heatsink	3.3
7	SSD	0

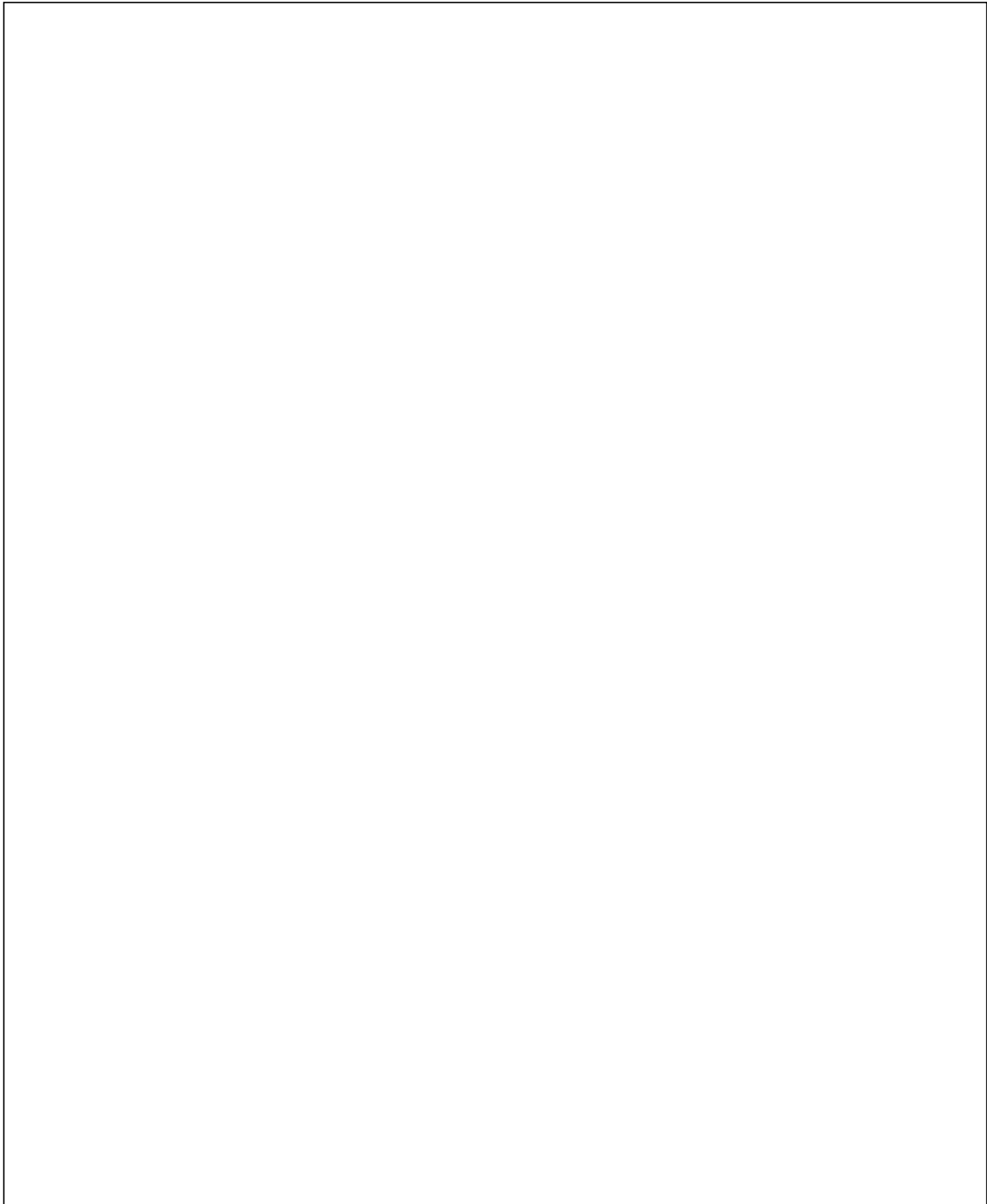


1	28.8	7	0.8	13	-0ver	19	-0ver
2	7.2	8	-0ver	14	-0ver	20	-0ver
3	-0ver	9	-0ver	15	-0ver	21	-0ver
4	-2.1	10	-0ver	16	-0ver	22	-0ver
5	26.4	11	-0ver	17	-0ver	23	-0ver
6	3.3	12	-0ver	18	-0ver	24	-0ver









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IV320CH-TX THERMAL TEST RESULT (-40~+60 DEGREE)

TEST POINT NO.	Ambient Temp.		-40° C	-20° C	0° C	40° C	50° c	60° c
	Test Point							
1	CPU		18.8	28.8	50.1	84.6	90	95.6
2	PCH		-4.5	7.2	27.9	64.6	72.7	80.6
4	CPU Heatsink		-6.3	-2.1	10.1	55.6	64.7	73
5	GPU		4.9	26.4	50.3	88.1	90.9	103.5
6	GPU Heatsink		-8	3.3	25.8	63	71.5	79.3
7	SSD		-22.6	0	20.8	61.1	70.7	79.1
	CPU TJ		37	55	71	100	100	100
	CPU FRQ		3.54GHz	3.54GHz	3.38GHz	3.01GHz	2.8GHz	2.32GHz
	GPU TJ		5	7	39	81	87	92
	GPU (MHZ)		1822MHZ	1822MHZ	1733MHZ	1720MHZ	1250MHZ	1290MHZ

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Low Temperature SYSTEM Boot up Test

- Ambient Temp. -40°C

