



AV800

GPU Accelerated XEON DE Server THERMAL TEST REPORT

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Test Report

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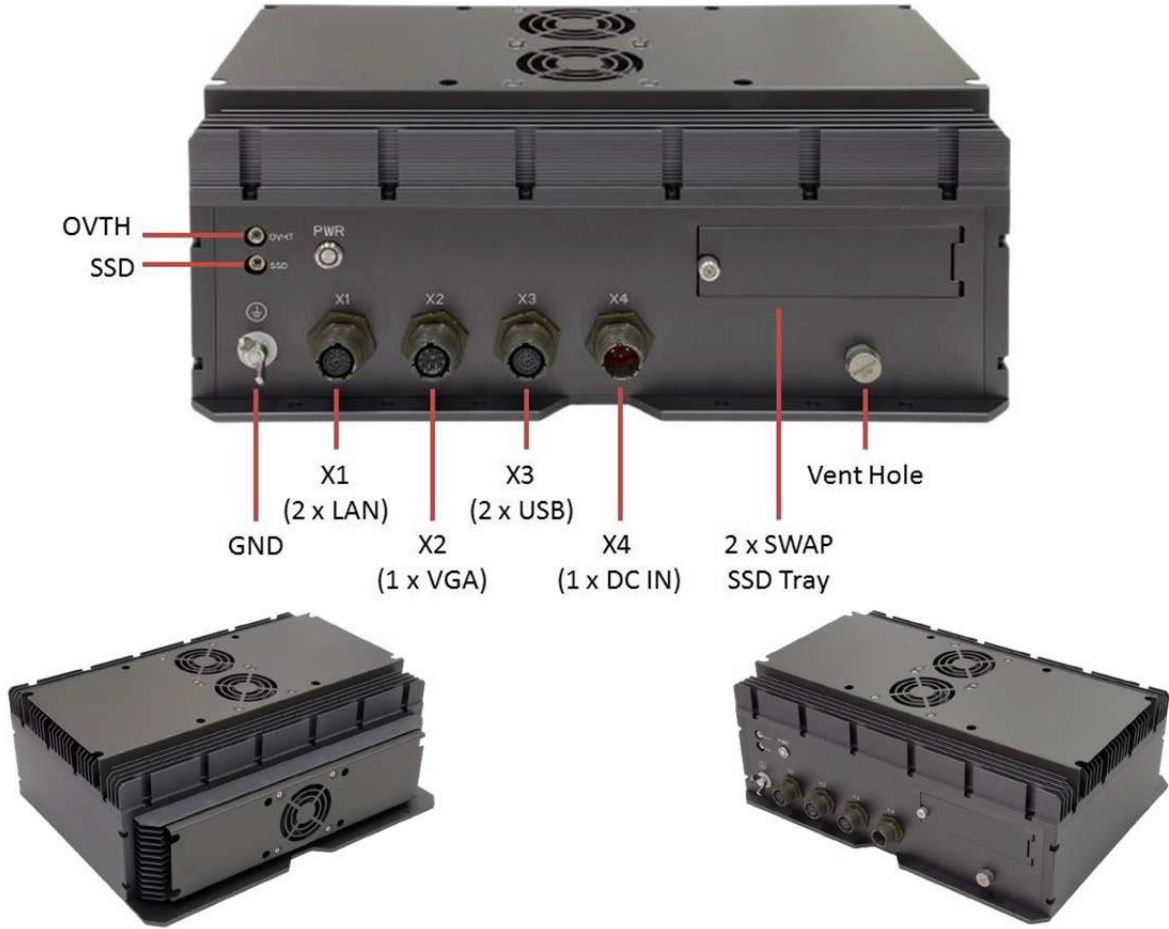
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1. SYSTEM SPEC

1-1. PRODUCT PHOTO



1-2. SYSTEM COBFIGURATION

System Configuration		
Item	Vendor	Description
Motherboard	SUPERMICRO	X11SDV-16C-TP8F
CPU	Intel	XEON-D-2183T(16C/32T)
Memory	Samsung	DDR4-3200 256GB , 64GB ECC+REG DIMM * 4
GPU	NVIDIA	Tesla T4 16G GDDR6
SATA port1	Advantech	960G SATA3 SSD (TLC)
SATA port2	Advantech	960G SATA3 SSD (TLC)
U.2 NVME	Advantech	8TB U.2 NVME (TLC)
LAN1	Intel	X722 10GBASE-T
LAN2	Intel	X722 10GBASE-T

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) 3. Infrared thermal imaging camera Model TVS-200EX</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>	<p>1. Thermal pre-scan measurement: Temperature: -20~60°C/40~60%RH Capture thermal IR photo for whole boards after the EUT execute passmark burn-in test with 100% lading during 1 hour at least. 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 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>																														
<p>Test diagram of curves</p>	<p>Environment defines for 8 hours</p> <table border="1"> <caption>Temperature Profile Data</caption> <thead> <tr> <th>Time (h)</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr><td>1.5</td><td>25</td></tr> <tr><td>3</td><td>-20</td></tr> <tr><td>4.5</td><td>-20</td></tr> <tr><td>5</td><td>-10</td></tr> <tr><td>6.5</td><td>-10</td></tr> <tr><td>8</td><td>40</td></tr> <tr><td>9.5</td><td>40</td></tr> <tr><td>10</td><td>50</td></tr> <tr><td>11.5</td><td>50</td></tr> <tr><td>12</td><td>55</td></tr> <tr><td>13.5</td><td>55</td></tr> <tr><td>14</td><td>60</td></tr> <tr><td>15.5</td><td>60</td></tr> <tr><td>16</td><td>25</td></tr> </tbody> </table>	Time (h)	Temperature (°C)	1.5	25	3	-20	4.5	-20	5	-10	6.5	-10	8	40	9.5	40	10	50	11.5	50	12	55	13.5	55	14	60	15.5	60	16	25
Time (h)	Temperature (°C)																														
1.5	25																														
3	-20																														
4.5	-20																														
5	-10																														
6.5	-10																														
8	40																														
9.5	40																														
10	50																														
11.5	50																														
12	55																														
13.5	55																														
14	60																														
15.5	60																														
16	25																														

2-2. AV800 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
-20°C	PASS
0°C	PASS
25°C	PASS
40°C	PASS
55°C	PASS

2-2-2. I/O FUNCTION

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

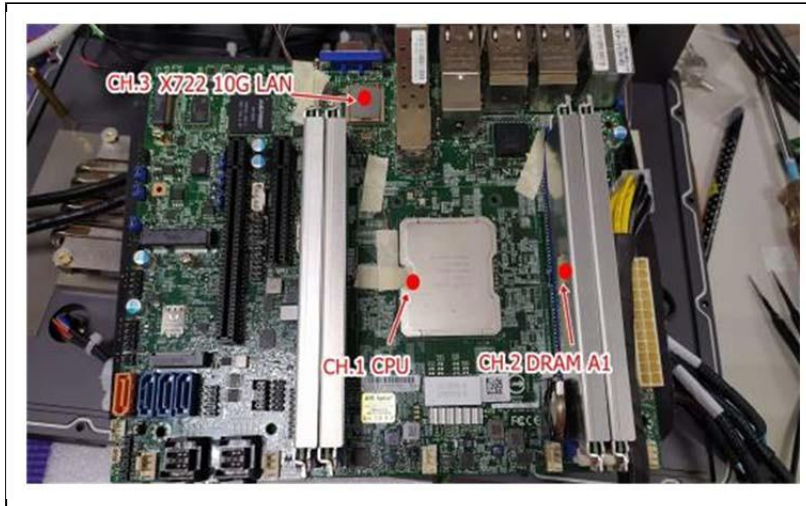
Item	Criteria	Result
X1 (10Gb LAN *2)	LAN Function Test	PASS
X2 (VGA)	Check work well	PASS
X3 (USB3.0*2)	Can use any USB device	PASS
	Loopback Plugs for USB 3.0 Trouble shooting and Testing	
X4 DC in	DC-IN 18~36V	PASS

2-2-3. LOW-TEMP. BOOT-UP

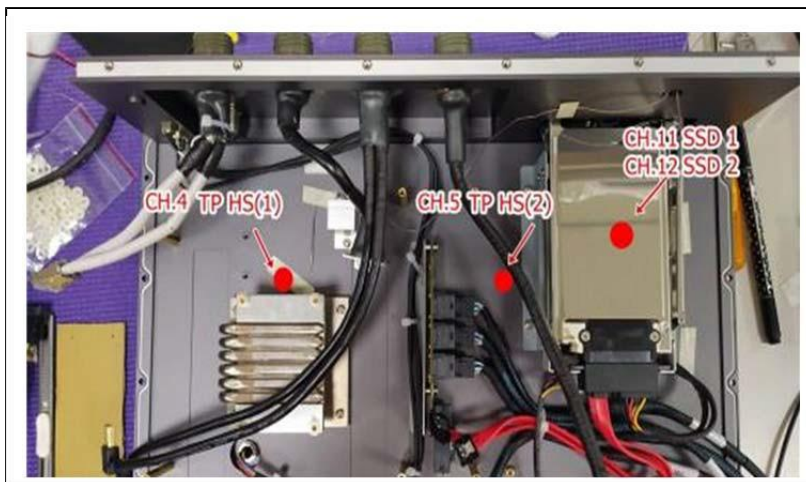
#Power supply under -20°C and ensure that the system boot up properly

Ambient Temp.	Test Result
-20°C	PASS

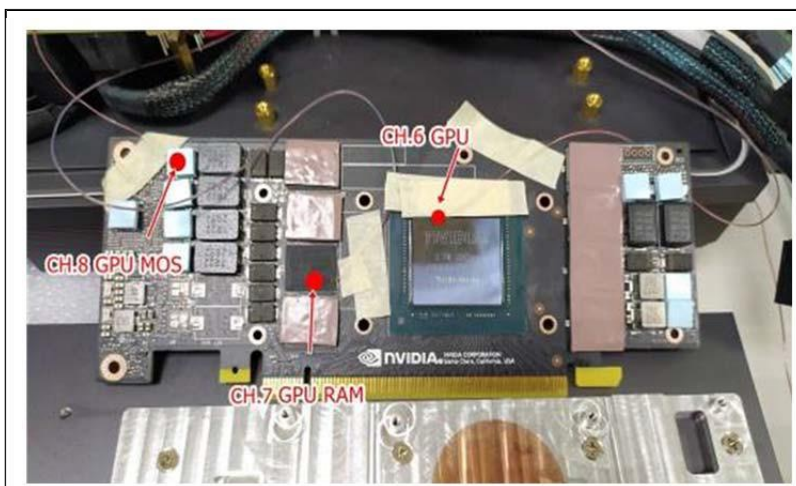
3. THERMAL TEST PHOTOS



CH1	CPU
CH2	DRAM A1
CH3	X722 10g LAN



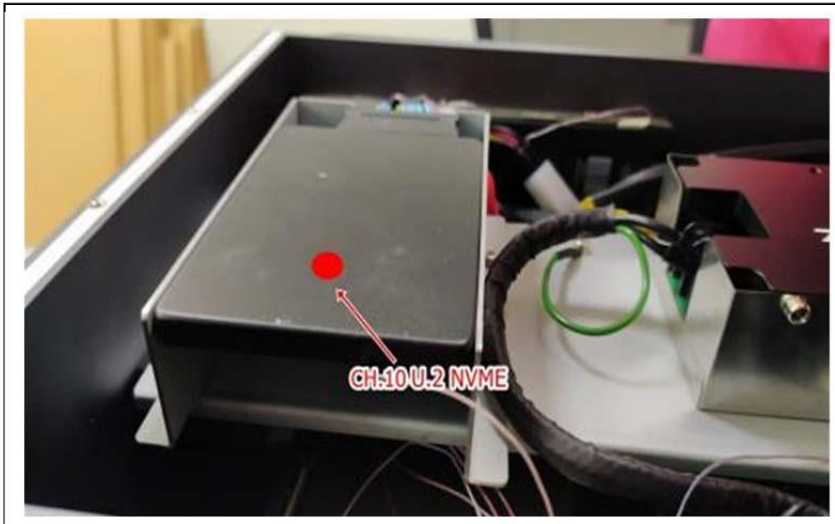
CH4	TP HS(1)
CH5	TP HS (2)
CH11	SSD1
CH12	SSD2



CH6	GPU
CH7	GPU RAM
CH8	SSD1



CH9	SK711 HS
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CH10	U.2 NVMe
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4. PHOTO IN LAB

- Chamber in -20°C



TEST POINT NO.	Temp.	-20°C
	CPU FRQ.	2.7Ghz
	CPU TJ.	18
	GPU FRQ.	1.32Ghz
	GPU TJ.	7
1	CPU	12.7
2	DRAM A1	-0.3
3	10G LAN X722 CHIP	-2.3
4	TOP HEAT SINK 1	-3.4
5	TOP HEAT SINK 2	-9.8
6	GPU	1.7
7	GPURAM	-1.8
8	GPU MOS	0.3
9	SK711 CHIP	-3.3
10	U.2NVME	-9.1
11	SSD 1	14.4
12	SSD 2	17.7

- Chamber in 0°C



TEST POINT NO.	Temp.	0°C
	CPU FRQ.	2.73Ghz
	CPU TJ.	34
	GPU FRQ.	1.32Ghz
	GPU TJ.	25.4
1	CPU	28.6
2	DRAM A1	19.2
3	10G LAN X722 CHIP	17.4
4	TOP HEAT SINK 1	15.7
5	TOP HEAT SINK 2	10
6	GPU	21.3
7	GPURAM	18.1
8	GPU MOS	20.2
9	SK711 CHIP	15.9
10	U.2NVME	10.3
11	SSD 1	35.4
12	SSD 2	35.4

- Chamber in +25°C



TEST POINT NO.	Temp.	25°C
	CPU FRQ.	2.78Ghz
	CPU TJ.	59
	GPU FRQ.	1.2Ghz
	GPU TJ.	48.9
1	CPU	54.3
2	DRAM A1	44.9
3	10G LAN X722 CHIP	43.1
4	TOP HEAT SINK 1	41.1
5	TOP HEAT SINK 2	35.3
6	GPU	46.8
7	GPURAM	43.8
8	GPU MOS	46.1
9	SK711 CHIP	41.5
10	U.2NVME	35.5
11	SSD 1	59.3
12	SSD 2	63.7

- Chamber in +40°C



TEST POINT NO.	Temp.	40°C
	CPU FRQ.	2.73Ghz
	CPU TJ.	75
	GPU FRQ.	1.1Ghz
	GPU TJ.	63.4
1	CPU	70.3
2	DRAM A1	61
3	10G LAN X722 CHIP	58.7
4	TOP HEAT SINK 1	56.9
5	TOP HEAT SINK 2	50.6
6	GPU	62..3
7	GPURAM	59.2
8	GPU MOS	61.6
9	SK711 CHIP	57.4
10	U.2NVME	50.5
11	SSD 1	75.8
12	SSD 2	82.1

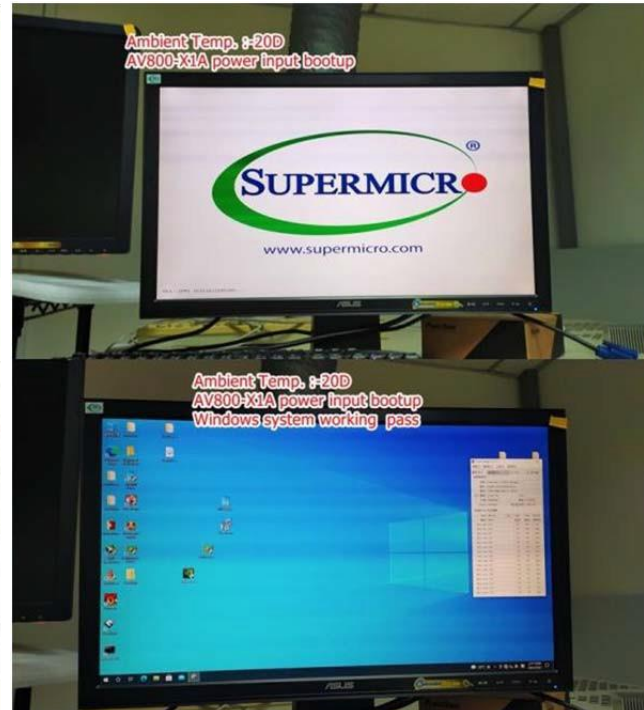
- Chamber in +55°C



TEST POINT NO.	Temp.	55°C
	CPU FRQ.	2.2Ghz
	CPU TJ.	86
	GPU FRQ.	870Mhz
	GPU TJ.	77.9
1	CPU	83.4
2	DRAM A1	75.4
3	10G LAN X722 CHIP	73.9
4	TOP HEAT SINK 1	71.3
5	TOP HEAT SINK 2	65.4
6	GPU	77.6
7	GPURAM	74.6
8	GPU MOS	77
9	SK711 CHIP	71.8
10	U.2NVME	65.5
11	SSD 1	79.1
12	SSD 2	82.7

Low Temperature SYSTEM Boot up Test

- Ambient Temp. -20°C



5. AV800 THERMAL TEST RESULT (-20~+60 DEGREE)

TEST POINT NO.	Temp.	-20°C	0°C	25°C	40°C	55°C	60°C
CPU FRQ.		2.7Ghz	2.73Ghz	2.78Ghz	2.73Ghz	2.2Ghz	2.2Ghz
CPU TJ.		18	34	59	75	86	89
GPU FRQ.		1.32Ghz	1.32Ghz	1.2Ghz	1.1Ghz	870Mhz	750Mhz
GPU TJ.		7	25.4	48.9	63.4	77.9	82.7
1	CPU	12.7	28.6	54.3	70.3	83.4	87.7
2	DRAM A1	-0.3	19.2	44.9	61	75.4	79.4
3	10G LAN X722 CHIP	-2.3	17.4	43.1	58.7	73.9	78.7
4	TOP HEAT SINK 1	-3.4	15.7	41.1	56.9	71.3	75.6
5	TOP HEAT SINK 2	-9.8	10	35.3	50.6	65.4	70.1
6	GPU	1.7	21.3	46.8	62.3	77.6	82.7
7	GPURAM	-1.8	18.1	43.8	59.2	74.6	79.5
8	GPU MOS	0.3	20.2	46.1	61.6	77	82.1
9	SK711 CHIP	-3.3	15.9	41.5	57.4	71.8	76.1
10	U.2NVME	-9.1	10.3	35.5	50.5	65.5	70.5
11	SSD 1	14.4	35.4	59.3	75.8	79.1	83.4
12	SSD 2	17.7	35.4	63.7	82.1	82.7	86.9