



# Thermal & Functions Test Report

## AV800-027



Product Manager	System Leader	System Engineer
Vinnie Yuan	James Chan	William Cheng

# Thermal & Functions Test Report

AV800-D27

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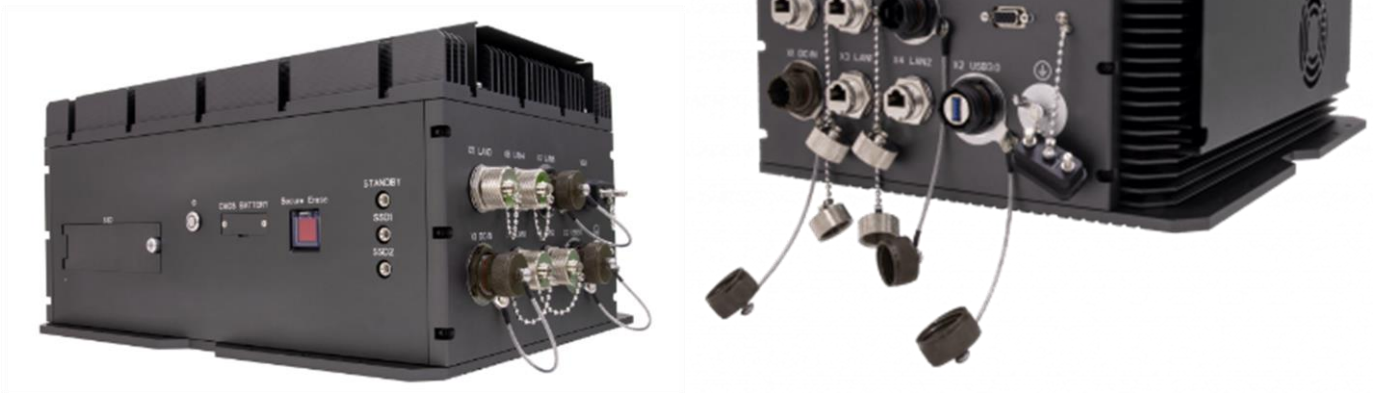
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## 1. SYSTEM SPEC

### 1-1. PRODUCT PHOTOS



### 1-2. SYSTEM COFIGURATION

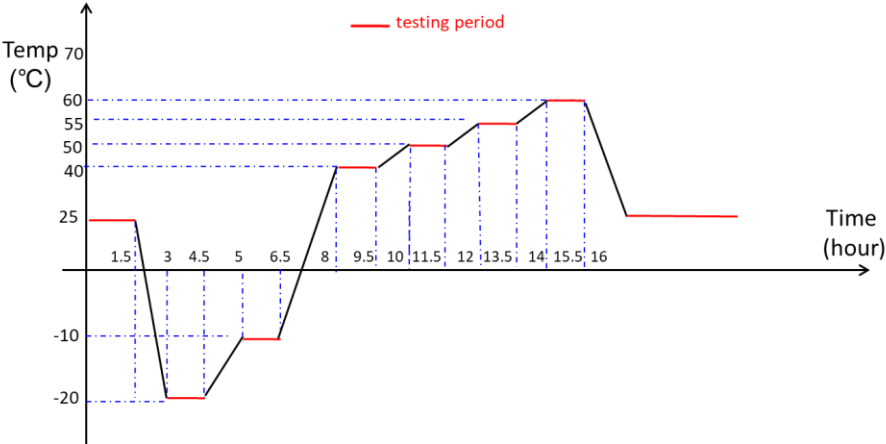
System Configuration	
<b>Motherboard</b>	Supermicro X12SDV-20CSPT8F
<b>CPU</b>	Intel® XEON D-2796NT
<b>Memory</b>	Samsung DDR4-2666 32G ECC+REG DIMM *2
<b>SSD</b>	EXSAM1E002TB125IEA 2.5" MLC 2TB W/AES
<b>POWER BOARD</b>	SK712 DC-DC 18V~36V
<b>GPU</b>	Nvidia A4500 MXM GPU
<b>100G LAN</b>	Mellanox Connectx6-dx Dual 100G LAN

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## 2. TEST PLAN

### 2.1. Thermal Measurement Process

Test Purpose	<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</p> <p>In case of systems cooling, patterns will vary with stacking choices, temperature/thermal mapping can aid in the development of optimum tacking arrangements</p>
Test Equipment	<p>1. KSON THS-B4T-150 Chamber 2. YOKOGAWA MV1000, Thermometer (FLUKE50D K/J)</p>
Quantity Tested	Minimum 1 Set
Test Software	Passmark Burn-In Test under Windows 10
Test Procecedure	<p>1. Thermal pre-scan measurement: Temperature: -20~60°C /60%RH</p> <p>2. Thermal actual measurement:</p> <ol style="list-style-type: none"> <li>Select the test points according to the IR photo and attach thermocouples to the hot points</li> <li>Put the EUT in thermal chamber and set the temperature profile of as test specification</li> <li>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>After the EUT executing the test software for 4 hours, record thermal maximum value for each thermocouples point.</li> <li>Turn off the thermal chamber and EUT</li> <li>Verify and check recorded figure of each components to its' operating temperature range listed in specification/approval sheet of each measured component</li> </ol>
Test diagram of curves	<p>Environment defines for 8 hours</p> 

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## 2.2. AV800-D27 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
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
<b>USB3.0 *1</b>	Connection 2.5" USB3.0 SSD device and transfer data test PassMark USB3.0 Loopback Plugs for Troubleshooting and Testing USB 3.0 ports.	PASS
<b>LAN *4</b>	Connection 1G/10G/100G SWITCH HUB transfer data test	PASS
<b>VGA *1</b>	Check work well	PASS

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## 2.2.3 LOW-TEMP. BOOT-UP

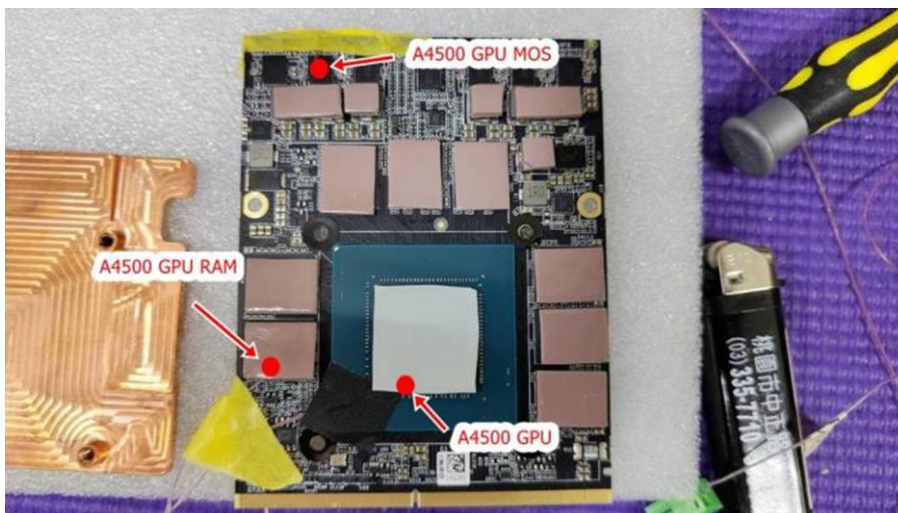
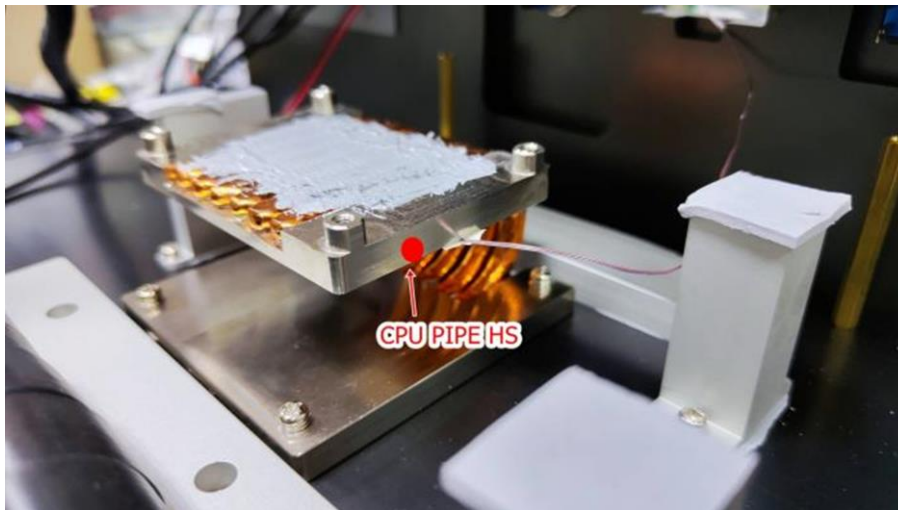
#Power supply under -20°C and ensure that the system boot up properly

Ambient Temp.	Test Result
-20°C	PASS

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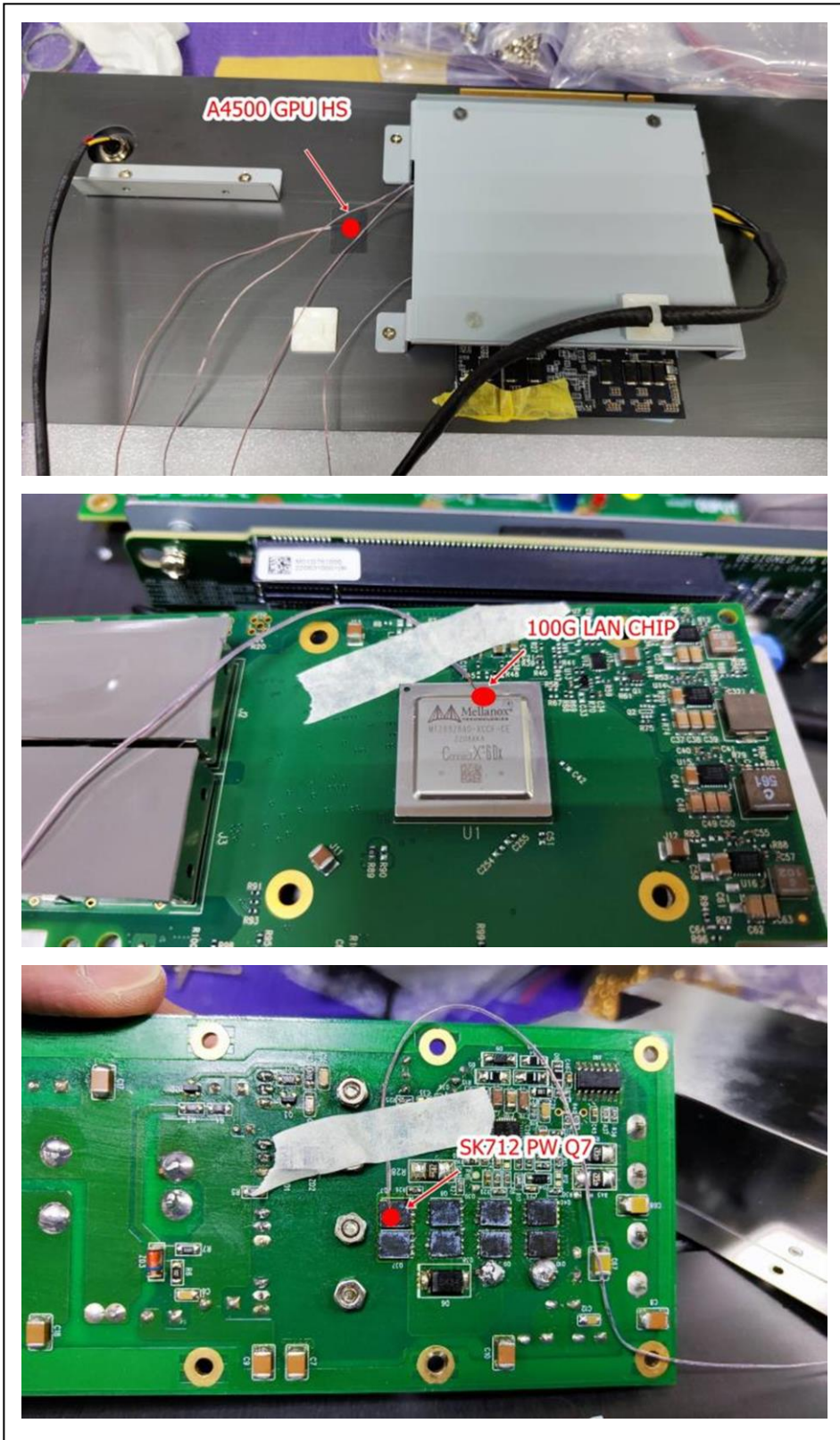
## 3. THERMAL TEST POINT



TEST POINT NO.	Test Point
1	CPU
2	PCH
3	DRAM
4	SSD
5	VGA Chip
6	SK708
7	CPU HS
8	VGA HS
9	LEFT CPU HS
10	RIGHT CPU HS

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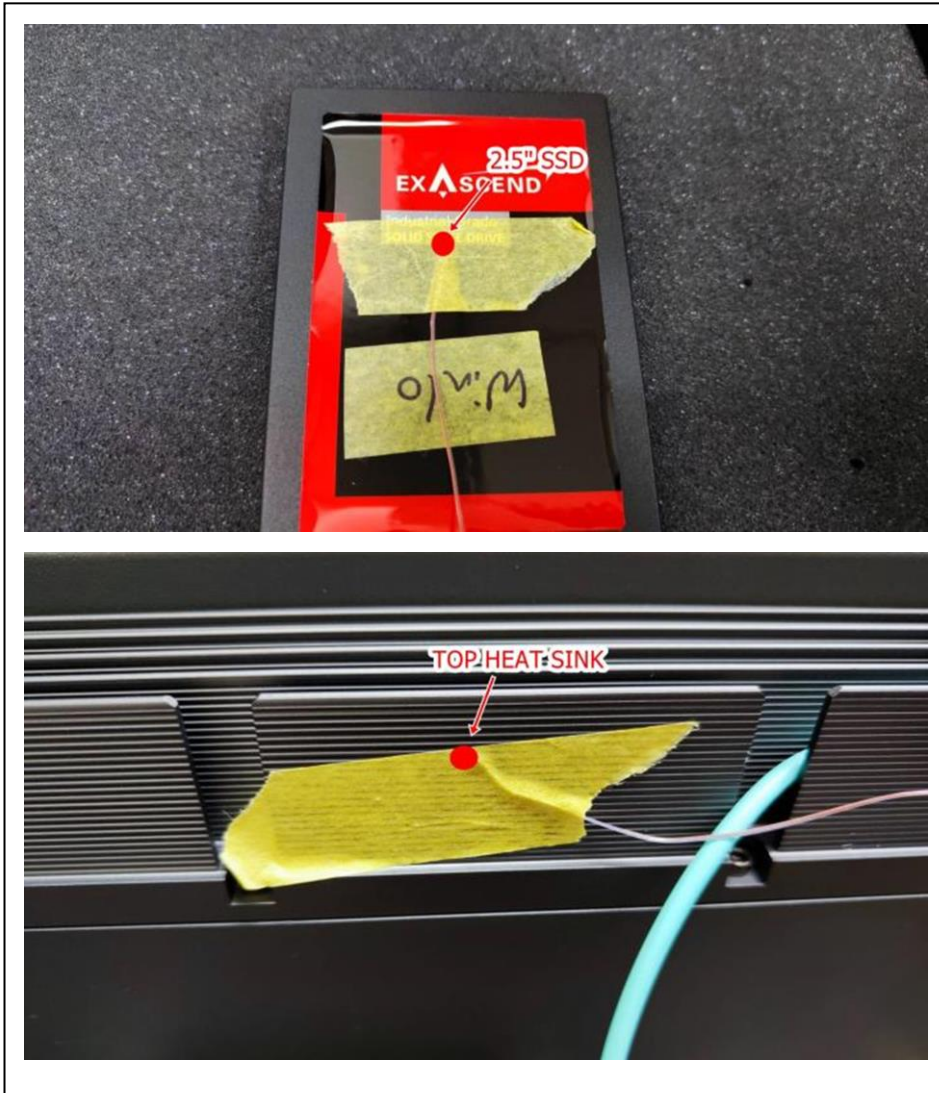
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# Thermal & Functions Test Report

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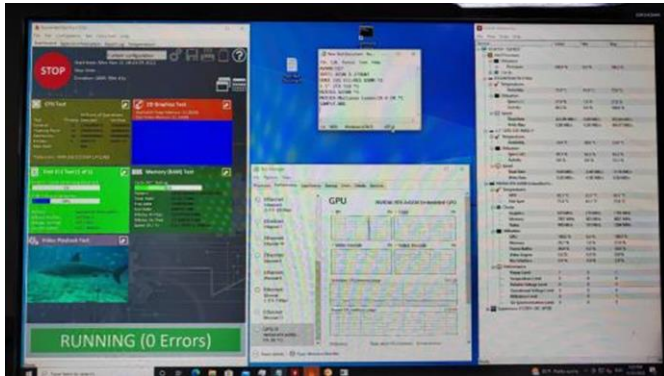


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## 4. TEST PHOTO IN LAB

- Chamber in 25°C

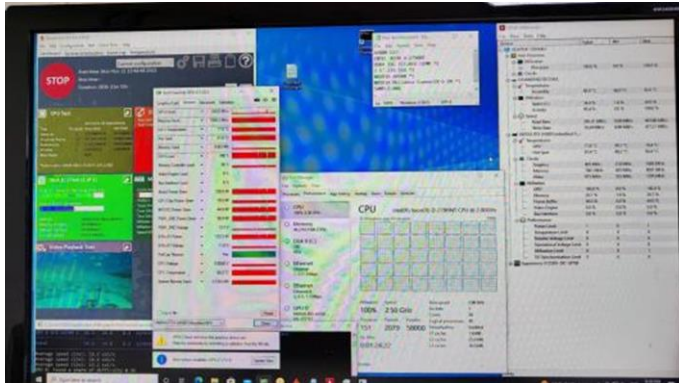


Test Point	Ambient Temp.	25°C
	<b>CPU FRQ.</b>	2.5G
	<b>CPU Tj. (&lt;105°C)</b>	81
1	<b>CPU</b>	61.6
2	<b>CPU PIPE HS</b>	50.8
3	<b>RAM</b>	47.6
4	<b>X550 LAN CHIP</b>	51.9
5	<b>X350 LAN CHIP</b>	46.7
6	<b>A4500 GPU</b>	56.7
7	<b>A4500 GPU RAM</b>	52.5
8	<b>A4500 GPU MOS</b>	46.2
9	<b>A4500 GPU HS</b>	37.1
10	<b>100G LAN CHIP</b>	45.7
11	<b>SK712 PW BOARD Q7</b>	58.9
12	<b>2.5" SSD</b>	N/A
13	<b>TOP HEST SINK</b>	NA

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### - Chamber in 40°C



- 1. CPU
- 2. CPU PIPE HS
- 3. RAM
- 4. X550 LAN CHIP
- 5. I350 LAN CHIP
- 6. A4500 GPU

- 7. A4500 GPU RAM
- 8. A4500 GPU MOS
- 9. A4500 GPU HS
- 10. 100G LAN CHIP
- 11. SK712 PW Q7
- 12. 2.5" SSD
- 13. TOP HEAT SINK



Test Point	Ambient Temp.	40°C
	<b>CPU FRQ.</b>	2.5G
	<b>CPU Tj. (&lt;105°C)</b>	95
1	<b>CPU</b>	79.1
2	<b>CPU PIPE HS</b>	66.8
3	<b>RAM</b>	64
4	<b>X550 LAN CHIP</b>	68.2
5	<b>X350 LAN CHIP</b>	63.4
6	<b>A4500 GPU</b>	72.9
7	<b>A4500 GPU RAM</b>	68.5
8	<b>A4500 GPU MOS</b>	62.8
9	<b>A4500 GPU HS</b>	52.1
10	<b>100G LAN CHIP</b>	62,5
11	<b>SK712 PW BOARD Q7</b>	77.7
12	<b>2.5" SSD</b>	85.1
13	<b>TOP HEST SINK</b>	41.1

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## - Chamber in 50°C



- 1. CPU
- 2. CPU PIPE HS
- 3. RAM
- 4. X550 LAN CHIP
- 5. X350 LAN CHIP
- 6. A4500 GPU
- 7. A4500 GPU RAM
- 8. A4500 GPU MOS
- 9. A4500 GPU HS
- 10. 100G LAN CHIP
- 11. SK712, PW Q7
- 12. 2.5" SSD
- 13. TOP HEAT SINK

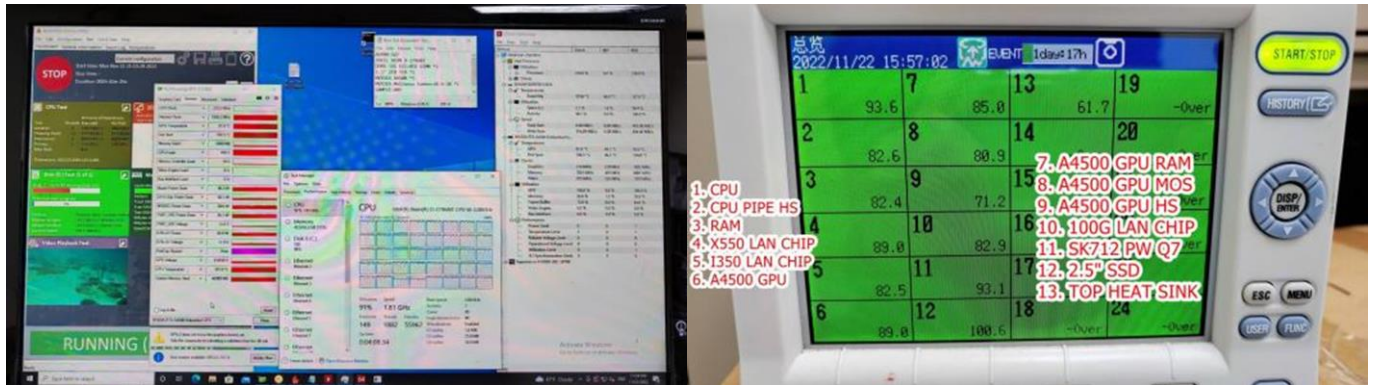


Test Point	Ambient Temp.	50°C
	CPU FRQ.	2.3G
	CPU Tj. (<105°C)	<b>101</b>
1	CPU	88.7
2	CPU PIPE HS	76.2
3	RAM	74.7
4	X550 LAN CHIP	79.6
5	X350 LAN CHIP	73.9
6	A4500 GPU	84
7	A4500 GPU RAM	79.3
8	A4500 GPU MOS	74.1
9	A4500 GPU HS	66.4
10	100G LAN CHIP	73.3
11	SK712 PW BOARD Q7	88.9
12	2.5" SSD	93.5
13	TOP HEST SINK	51.6

# Thermal & Functions Test Report

## AV800-D27

- Chamber in 60°C



- 1. CPU
- 2. CPU PIPE HS
- 3. RAM
- 4. X550 LAN CHIP
- 5. X350 LAN CHIP
- 6. A4500 GPU
- 7. A4500 GPU RAM
- 8. A4500 GPU MOS
- 9. A4500 GPU HS
- 10. 100G LAN CHIP
- 11. SK712 PW Q7
- 12. 2.5" SSD
- 13. TOP HEAT SINK

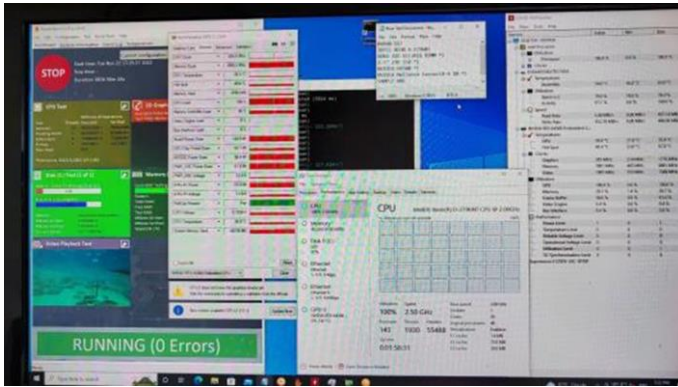


Test Point	Ambient Temp.	60°C
	<b>CPU FRQ.</b>	1.8G
	<b>CPU Tj. (&lt;105°C)</b>	<b>101</b>
<b>1</b>	<b>CPU</b>	93.6
<b>2</b>	<b>CPU PIPE HS</b>	82.6
<b>3</b>	<b>RAM</b>	82.4
<b>4</b>	<b>X550 LAN CHIP</b>	89
<b>5</b>	<b>X350 LAN CHIP</b>	82.5
<b>6</b>	<b>A4500 GPU</b>	89
<b>7</b>	<b>A4500 GPU RAM</b>	85
<b>8</b>	<b>A4500 GPU MOS</b>	80.9
<b>9</b>	<b>A4500 GPU HS</b>	71.2
<b>10</b>	<b>100G LAN CHIP</b>	82.9
<b>11</b>	<b>SK712 PW BOARD Q7</b>	93.1
<b>12</b>	<b>2.5" SSD</b>	100.6
<b>13</b>	<b>TOP HEST SINK</b>	61.7

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### - Chamber in 0°C

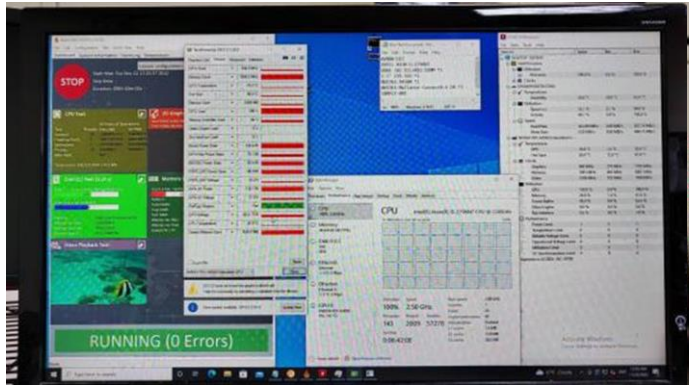


Test Point	Ambient Temp.	60°C
	<b>CPU FRQ.</b>	2.5G
	<b>CPU Tj. (&lt;105°C)</b>	50
1	<b>CPU</b>	33.3
2	<b>CPU PIPE HS</b>	25.3
3	<b>RAM</b>	21.5
4	<b>X550 LAN CHIP</b>	25
5	<b>X350 LAN CHIP</b>	20.6
6	<b>A4500 GPU</b>	29.8
7	<b>A4500 GPU RAM</b>	27.2
8	<b>A4500 GPU MOS</b>	18.6
9	<b>A4500 GPU HS</b>	10.5
10	<b>100G LAN CHIP</b>	19.4
11	<b>SK712 PW BOARD Q7</b>	30.4
12	<b>2.5" SSD</b>	NA
13	<b>TOP HEST SINK</b>	0.9

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### - Chamber in -20°C



- 1. CPU
- 2. CPU PIPE HS
- 3. RAM
- 4. X550 LAN CHIP
- 5. I350 LAN CHIP
- 6. A4500 GPU
- 7. A4500 GPU RAM
- 8. A4500 GPU MOS
- 9. A4500 GPU HS
- 10. 100G LAN CHIP
- 11. SK712 PW Q7
- 12. 2.5" SSD
- 13. TOP HEAT SINK



Test Point	Ambient Temp.	-20°C
	CPU FRQ.	2.5G
	CPU Tj. (<105°C)	36
1	CPU	17.8
2	CPU PIPE HS	10.4
3	RAM	1.6
4	X550 LAN CHIP	4.6
5	X350 LAN CHIP	0.6
6	A4500 GPU	10.9
7	A4500 GPU RAM	7.8
8	A4500 GPU MOS	-1.1
9	A4500 GPU HS	-9.3
10	100G LAN CHIP	-0.8
11	SK712 PW BOARD Q7	8.4
12	2.5" SSD	27.7
13	TOP HEST SINK	-18.5

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## Low Temperature SYSTEM Boot up Test

- Ambient Temp. -20°C





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## 5. ROC236AX THERMAL TEST RESULT (-20~+60 DEGREE)

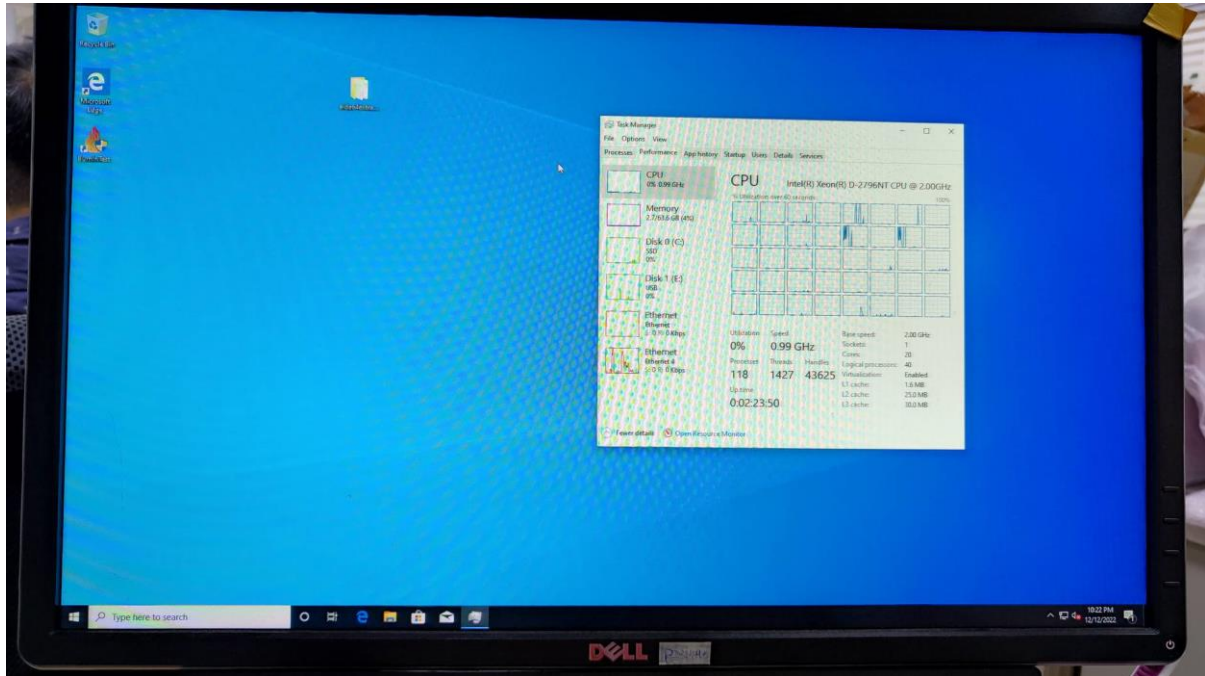
TEST POINT NO.	Test Point	Ambient Temp.					
		-20°C	0°C	25°C	40°C	50°C	60°C
	CPU FRQ.	2.5G	2.5G	2.5G	2.5G	2.3G	1.8G
	CPU Tj. (<105°C)	36	50	81	95	101	101
1	CPU	17.8	33.3	61.6	79.1	88.7	93.6
2	CPU PIPE HS	10.4	25.3	50.8	66.8	76.2	82.6
3	RAM	1.6	21.5	47.6	64	74.7	82.4
4	X550 LAN CHIP	4.6	25	51.9	68.2	79.6	89
5	X350 LAN CHIP	0.6	20.6	46.7	63.4	73.9	82.5
6	A4500 GPU	10.9	29.8	56.7	72.9	84	89
7	A4500 GPU RAM	7.8	27.2	52.5	68.5	79.3	85
8	A4500 GPU MOS	-1.1	18.6	46.2	62.8	74.1	80.9
9	A4500 GPU HS	-9.3	10.5	37.1	52.1	66.4	71.2
10	100G LAN CHIP	-0.8	19.4	45.7	62.5	73.3	82.9
11	SK712 PW BOARD Q7	8.4	30.4	58.9	77.7	88.9	93.1
12	2.5" SSD	27.7	NA	N/A	85.1	93.5	100.6
13	TOP HEST SINK	-18.5	0.9	NA	41.1	51.6	61.7

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## 6. I/O FUNCTION TEST

### 6.1 VGA OUTPUT TEST

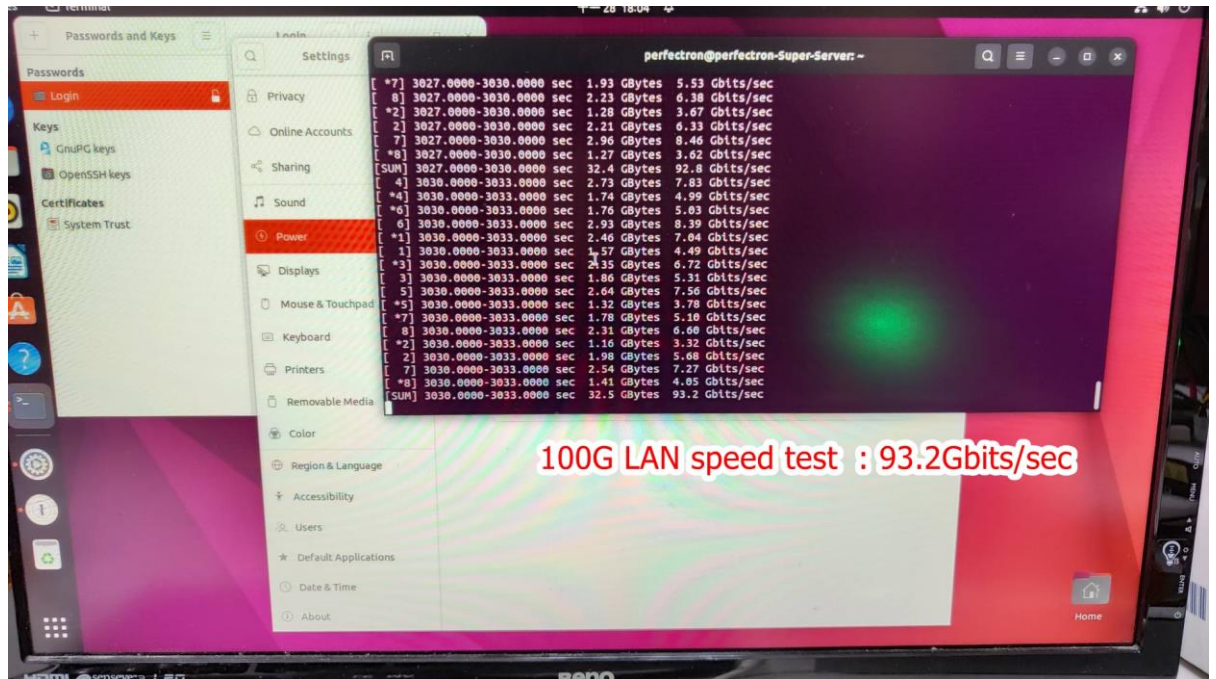


# Thermal & Functions Test Report

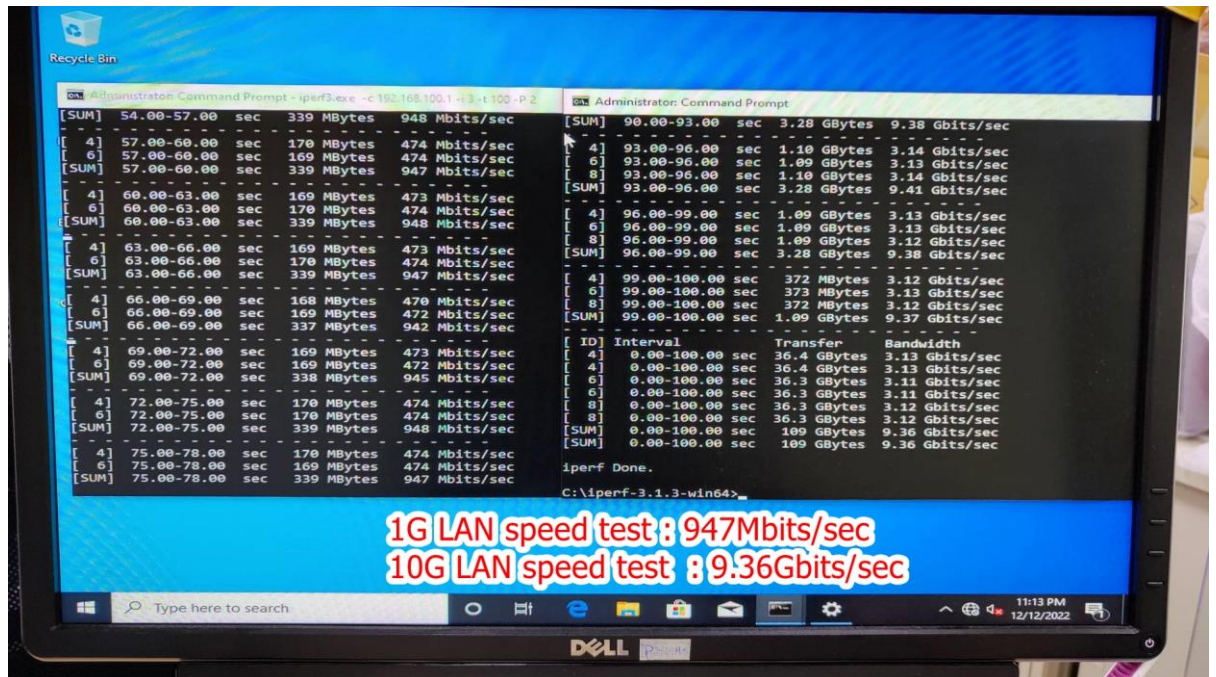
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## 6.2 1 LAN Transfer Data Test

### (1)100G LAN Test



### (2)1G/10G LAN Test



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## 6.3 USB 3.0 Transfer Data Test

