



PRODUCT OUTGOING QUALITY INSPECTION REPORT



IV320-KS-KD

S/N: SR202404240101

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Outgoing Quality Inspection

IV320-KS-KD



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1. SPECIFICATION

1-1. SYSTEM CONFIGURATION

Motherboard	SK515M+COM Express CPU module MXM Type 3.1 Support NVIDIA® GTX® / RTX® GPU GPU Support Up to MXM RTX 5000 Ada (9728 CUDA, 16GB RAM) PCI/104 Express Expansion Slot for Modular Open Structure Multi-Expansion Slots include Dual Mini PCIe Express Slots, 1x M.2 Slot Wide Range DC 9V~36V Input Extreme Temperature Support -40°C to 85°C
CPU	Intel® Core™ i7-13800HRE Processor Total Cores: 14 # of Performance-cores: 6 # of Efficient-cores: 8 Total Threads: 20 Max Turbo Frequency: 5.00 GHz Performance-core Max Turbo Frequency: 5.00 GHz Efficient-core Max Turbo Frequency: 4.00 GHz Processor Base Frequency: 2.50 GHz Cache 24 MB Intel® Smart Cache TDP: 45 W
Memory	64GB DDR5 SO-DIMM wide temp. (0C02AM425R4GD00L*2pcs)
Storage	2* 2TB SATA SSD wide temperature (2 x Swappable Tray) (0I05077SL02TB00L*2pcs)
GPU	Nvidia RTX A4500 Embedded GPU BIOS Version: 94.04.81.00.30 CUDA parallel-processing cores: 5888 CUDA® cores GPU base/boost clock: 930 MHz / 1500 MHz Max Power Consumption: 80 W
Power Module	SK708 (0L18SK708000P3PF*1pcs)
RS485 Serial Port	EGP2-X401 M.2 to 4 x RS232/422/485 Module

2. TEST PLAN

2-1. THERMAL MEASUREMENT PROCESS

<p>Test Purpose</p>	<p>The purpose of performing thermal profile testing is to identify potential thermal issues with the EUT. Considering that semiconductor failure rates rise rapidly with increasing junction temperature, it can aid product reliability assessment. As the system cools down, the mode will change with stack selection, temperature/heat. Mapping can help develop the best tracking arrangements.</p>																																										
<p>Test Equipment</p>	<p>1. KSON THS-B4T-150 Chamber.</p>																																										
<p>Quantity Tested</p>	<p>Minimum 1 Set</p>																																										
<p>Test Software</p>	<p>1. Stress CPU: PassMark Burn-in Test Software Ver 9.0 2. Stress GPU: AIDA64 extreme590 3. LAN Speed Test: iPerf3</p>																																										
<p>Test Procedure</p>	<p>1. Thermal pre-scan measurement: Temperature: -20°C~60°C Humidity: 85%RH (Temperature above 25°C)</p> <p>2. Actual thermal measurement: 2-1. Select the test point based on the infrared photo and connect the thermocouple to the hot spot. 2-2. Place the EUT into the hot chamber and set the test temperature curve Specification. 2-3. Open the hot cell and power up the EUT, enter the Windows 10 Pro environment and perform a maximum power test + stress application. 2-4. After the EUT executes the test software for 8 hours, record the maximum heat generation of each thermocouple point. 2-5. Turn off the hot cell and EUT. 2-6. Verify and check that the recorded information for each component complies with the operating temperature range listed in the specification/approval sheet for each component being tested.</p>																																										
<p>Test Diagram of Curves</p>	<p>Environment defines for 53 hours.</p> <table border="1"> <caption>Thermal Profile Data Points</caption> <thead> <tr> <th>Time (hour)</th> <th>Temperature (°C)</th> <th>Event</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>25</td> <td>Temperature rise</td> </tr> <tr> <td>1.5</td> <td>-20</td> <td>Temperature drop</td> </tr> <tr> <td>9.5</td> <td>25</td> <td>Temperature rise</td> </tr> <tr> <td>18.5</td> <td>25</td> <td>Testing period start</td> </tr> <tr> <td>26.5</td> <td>40</td> <td>Temperature rise</td> </tr> <tr> <td>27.0</td> <td>40</td> <td>Temperature rise</td> </tr> <tr> <td>35.0</td> <td>50</td> <td>Temperature rise</td> </tr> <tr> <td>35.5</td> <td>50</td> <td>Temperature rise</td> </tr> <tr> <td>43.5</td> <td>60</td> <td>Temperature rise</td> </tr> <tr> <td>44.0</td> <td>60</td> <td>Temperature rise</td> </tr> <tr> <td>52.0</td> <td>60</td> <td>Testing period end</td> </tr> <tr> <td>52.5</td> <td>25</td> <td>Temperature drop</td> </tr> <tr> <td>53.0</td> <td>25</td> <td>Temperature drop</td> </tr> </tbody> </table>	Time (hour)	Temperature (°C)	Event	0.5	25	Temperature rise	1.5	-20	Temperature drop	9.5	25	Temperature rise	18.5	25	Testing period start	26.5	40	Temperature rise	27.0	40	Temperature rise	35.0	50	Temperature rise	35.5	50	Temperature rise	43.5	60	Temperature rise	44.0	60	Temperature rise	52.0	60	Testing period end	52.5	25	Temperature drop	53.0	25	Temperature drop
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0.5	25	Temperature rise																																									
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52.0	60	Testing period end																																									
52.5	25	Temperature drop																																									
53.0	25	Temperature drop																																									

2-2. Test Result <Test Item>

2-2-1. TEMPERATURE CYCLE

Aging test of various parts at different temperatures under maximum load and full load conditions.

Test Temperature	Test Result
-20°C	PASS
0°C	PASS
25°C / 85%RH	PASS
40°C / 85%RH	PASS
50°C / 85%RH	PASS
60°C / 85%RH	PASS

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2-2-2. I/O FUNCTION

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

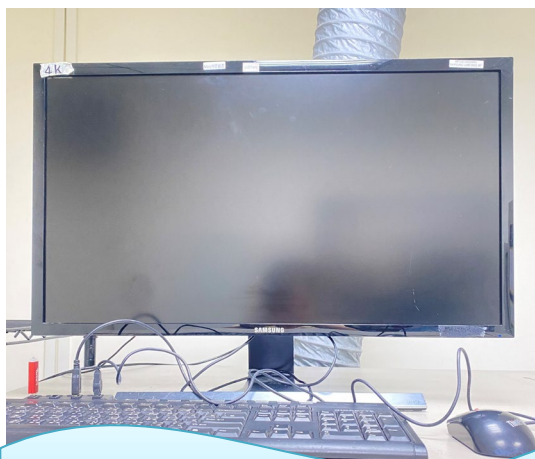
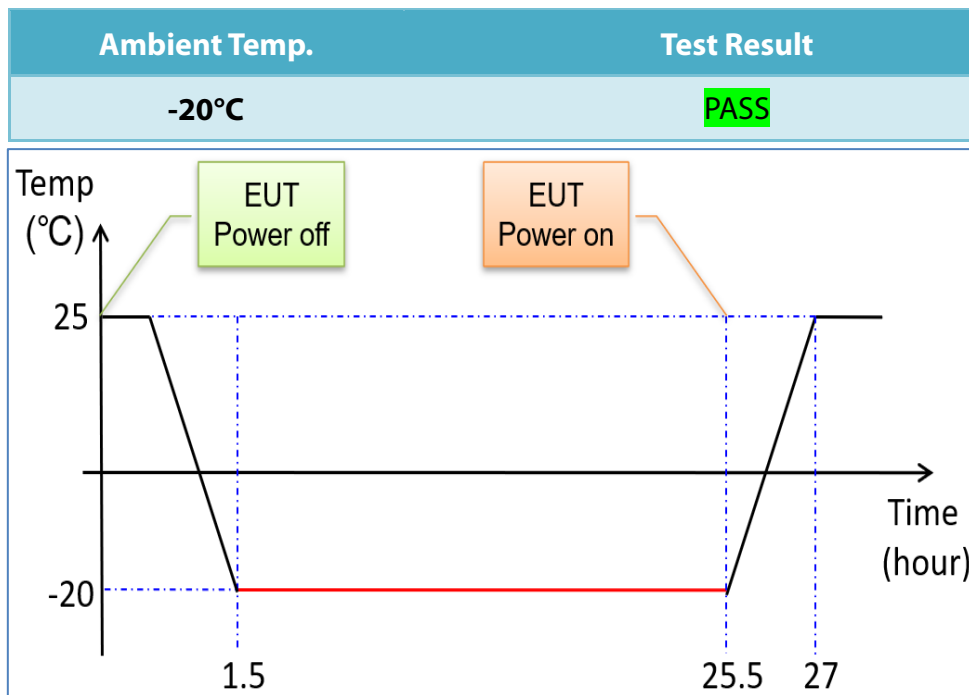
Item	Test Criteria	Result
X1Port - LAN (2.5Gbps)	Connection 1G/2.5G/10G/100G SWITCH HUB transfer data test, it can work normally.	PASS
X2 Port - LAN (2.5Gbps)	Connection 1G/2.5G/10G/100G SWITCH HUB transfer data test, it can work normally.	PASS
X3 Port – CANBus (COM 5)	Connect to the test computer to exchange messages.	PASS
X3 Port – CANBus (COM 6)	Connect to the test computer to exchange messages.	PASS
X4 Port – RS485 (COM 3)	Connect to the test computer to exchange messages.	PASS
X4 Port – RS485 (COM 4)	Connect to the test computer to exchange messages.	PASS
X4 Port – RS485 (COM 7)	Connect to the test computer to exchange messages.	PASS
X4 Port – RS485 (COM 8)	Connect to the test computer to exchange messages.	PASS
X8 Port - USB3.0	Connect a PassMark USB 3.0 Loopback Plugs for testing, it can work normally.	PASS
X9 Port - USB3.0	Connect a PassMark USB 3.0 Loopback Plugs for testing, it can work normally.	PASS
X10 Port - Mini DP	Check work well. (Max Resolution: 4K at 3840 x 2160)	PASS

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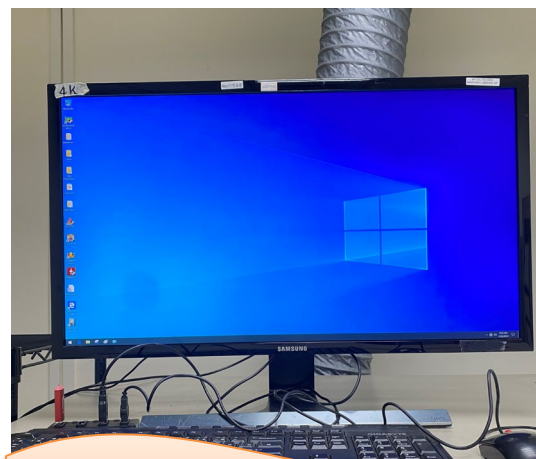
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2-2-3. LOW-TEMPERATURE & BOOT-UP

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



Power off

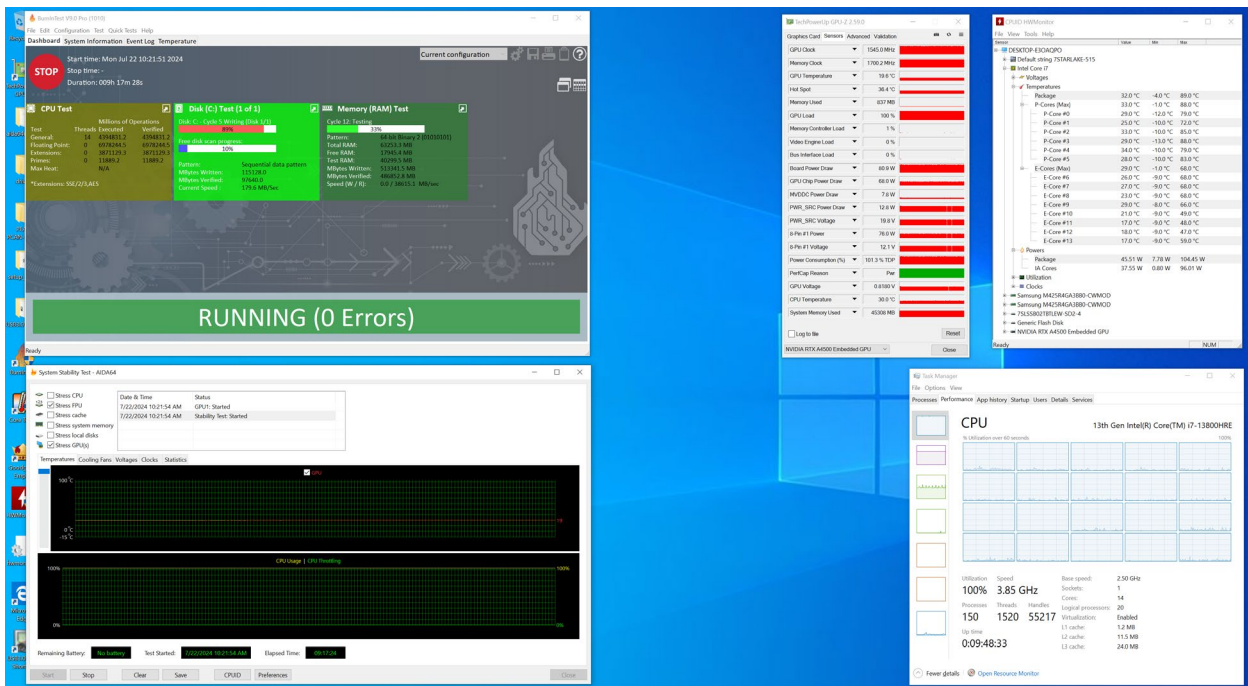


Power on



3. TEST PHOTO IN LAB

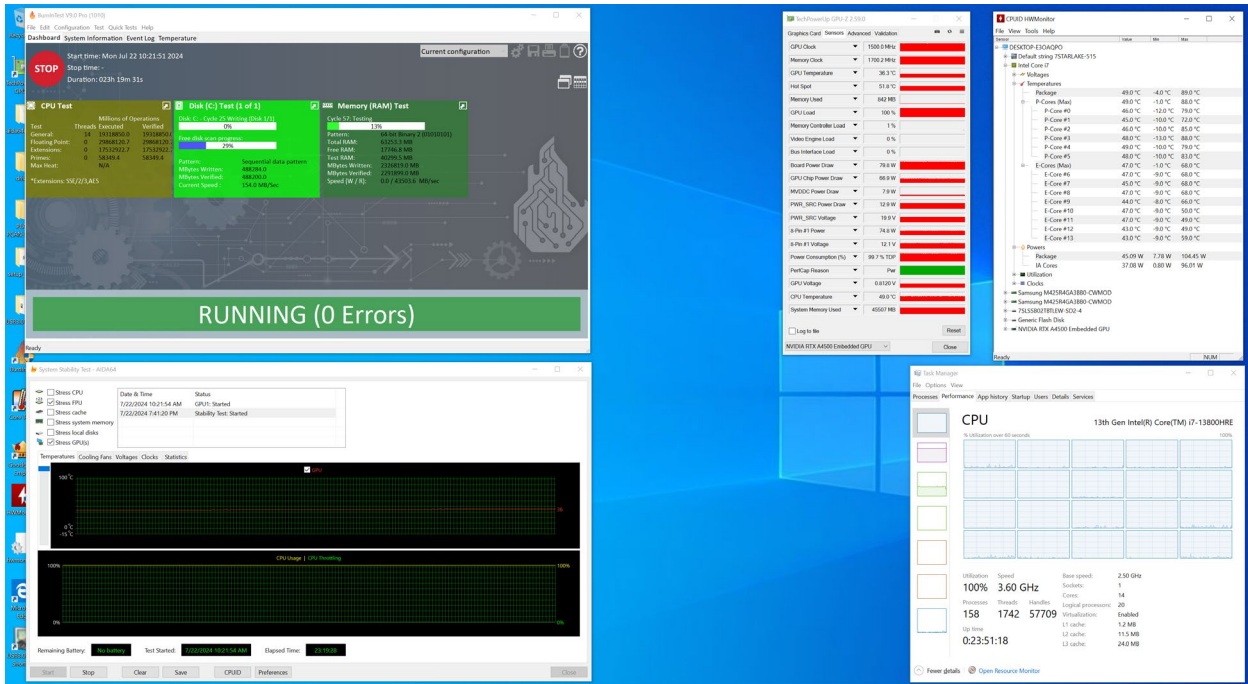
- Chamber in -20°C



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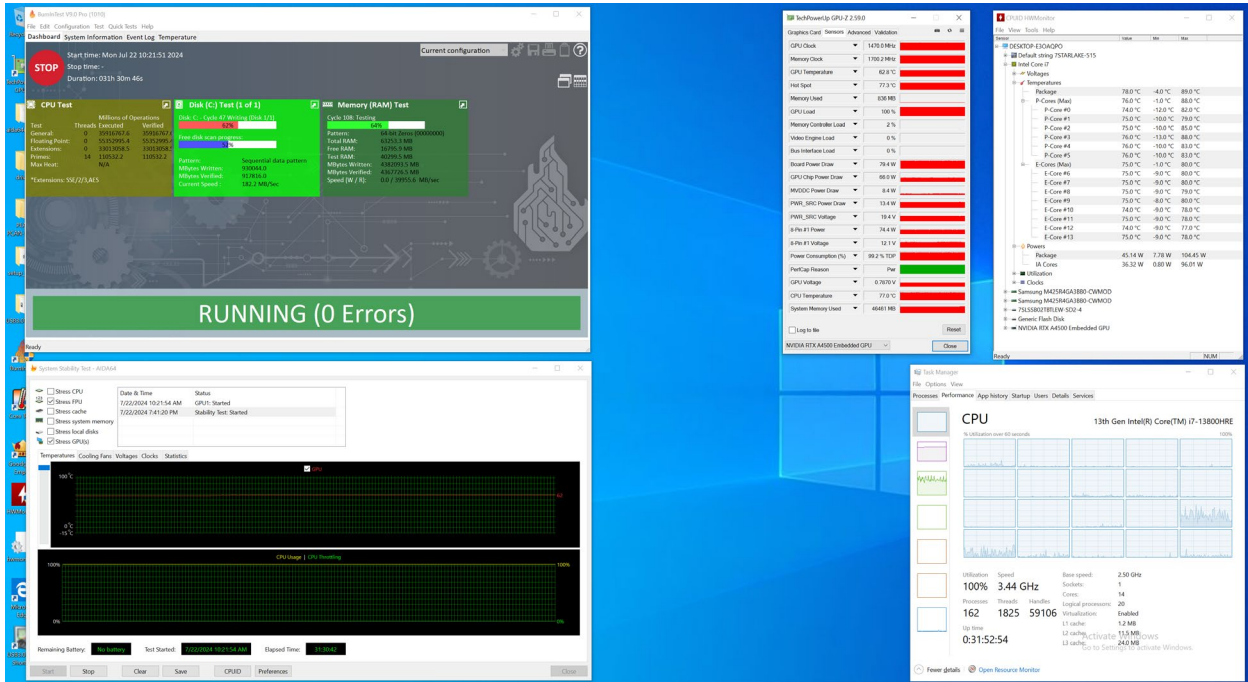
- Chamber in 0°C



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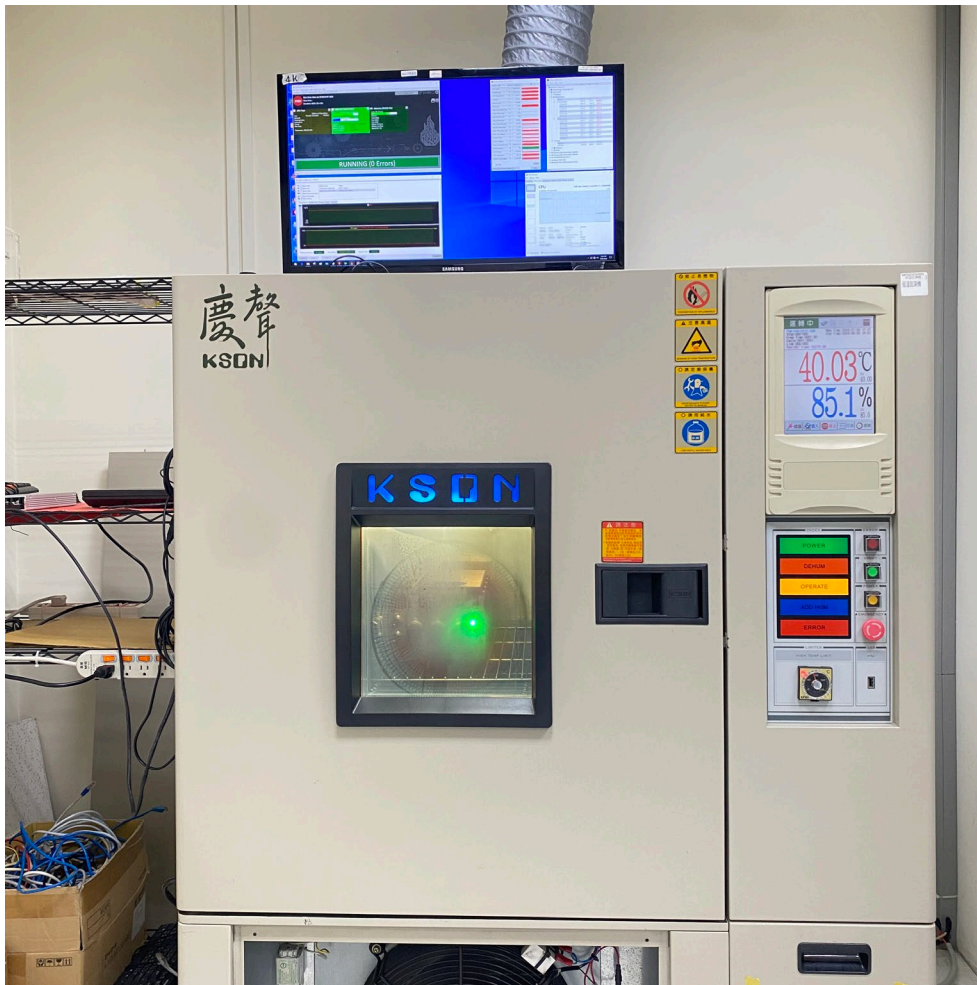
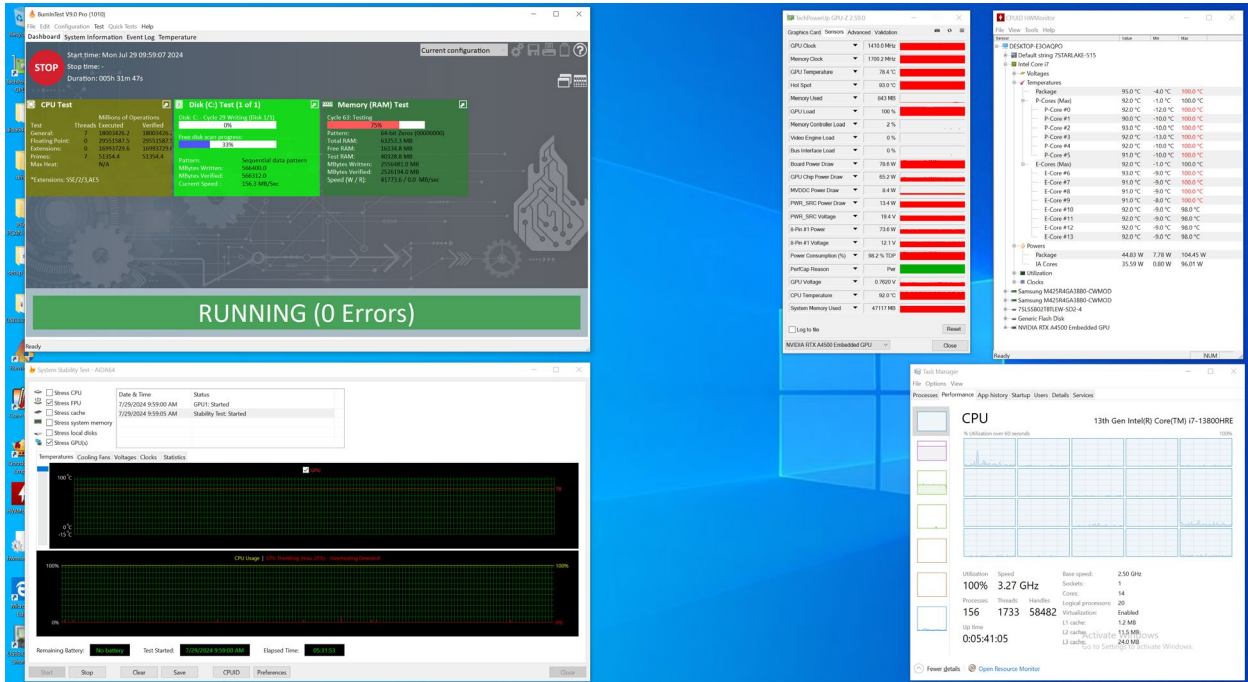
- Chamber in 25°C / 85%RH



Outgoing Quality Inspection

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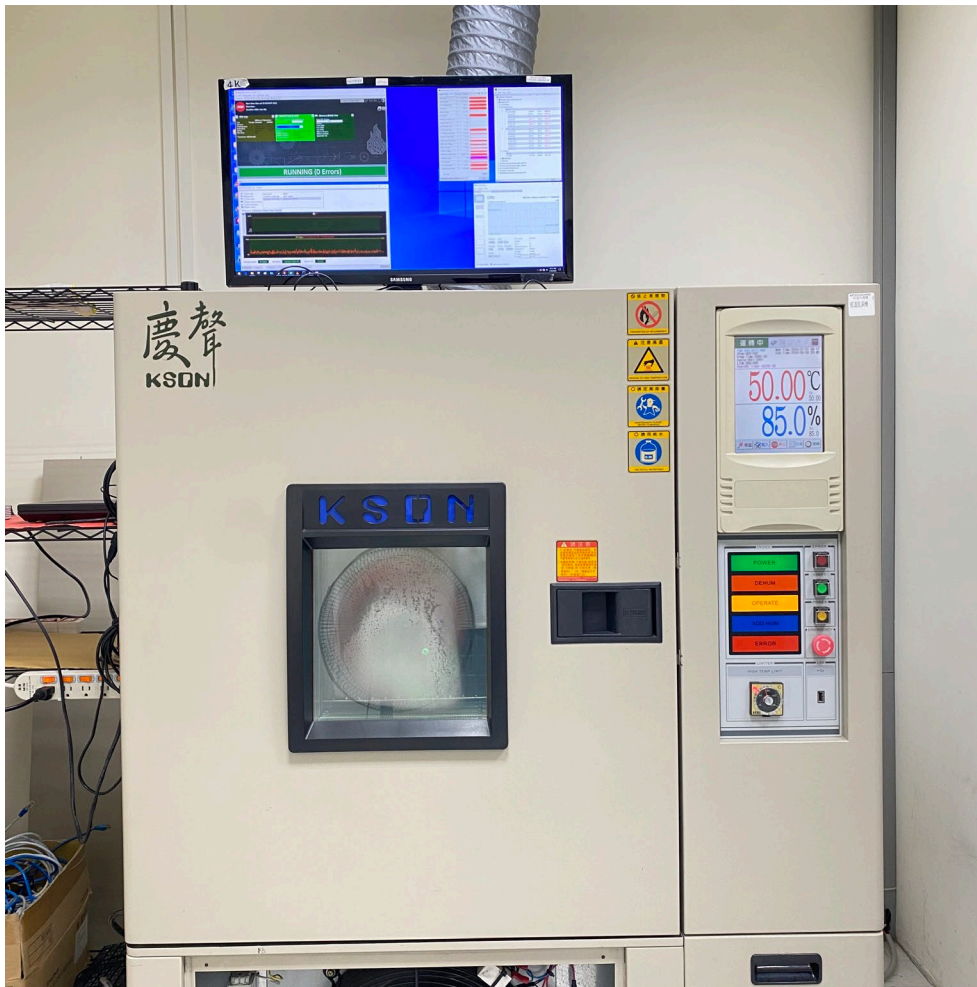
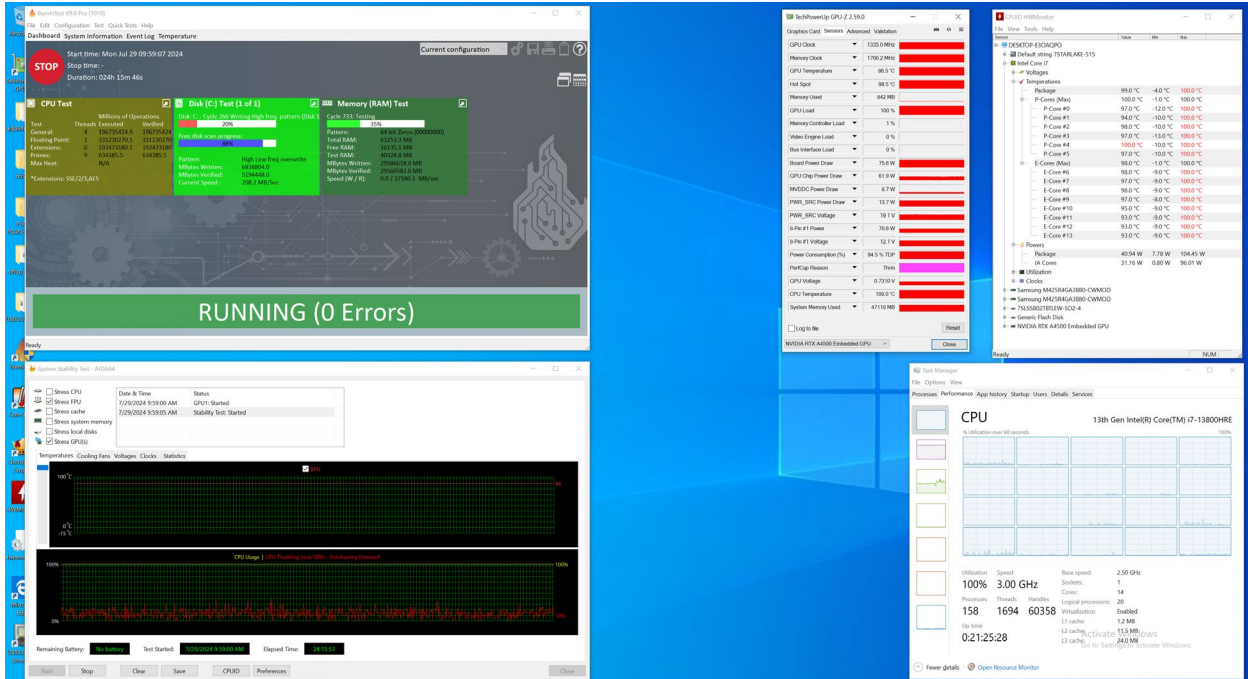
- Chamber in 40°C / 85%RH



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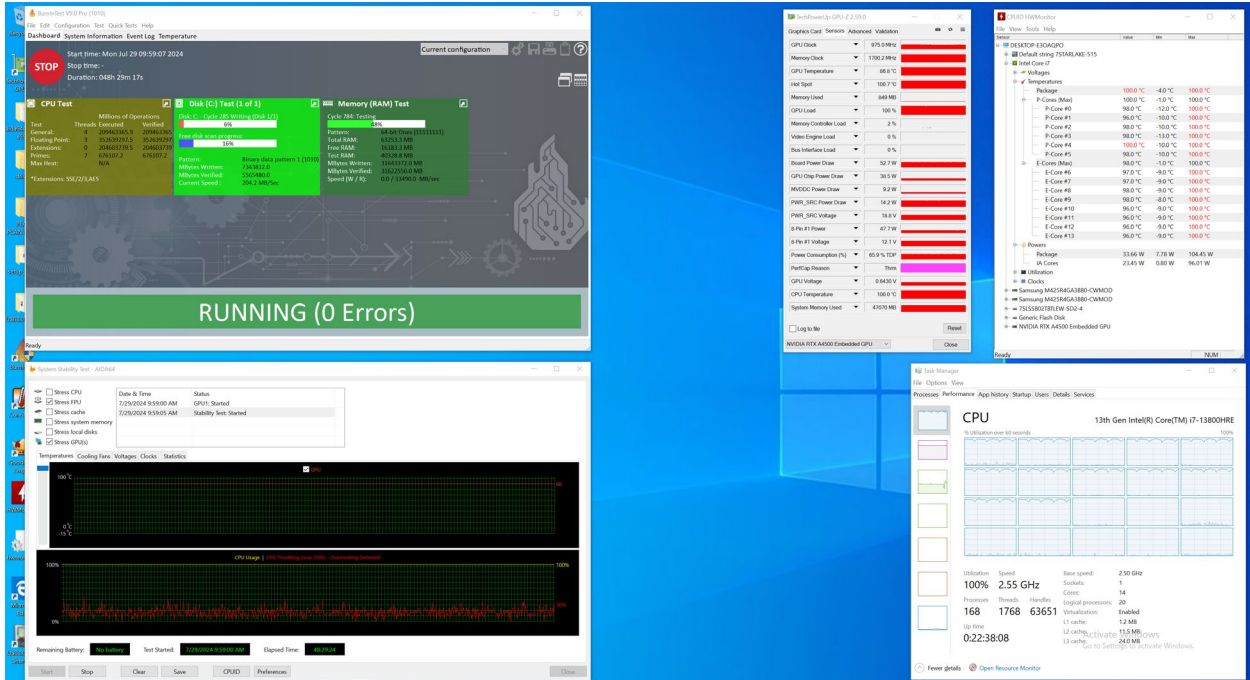
- Chamber in 50°C / 85%RH



Outgoing Quality Inspection

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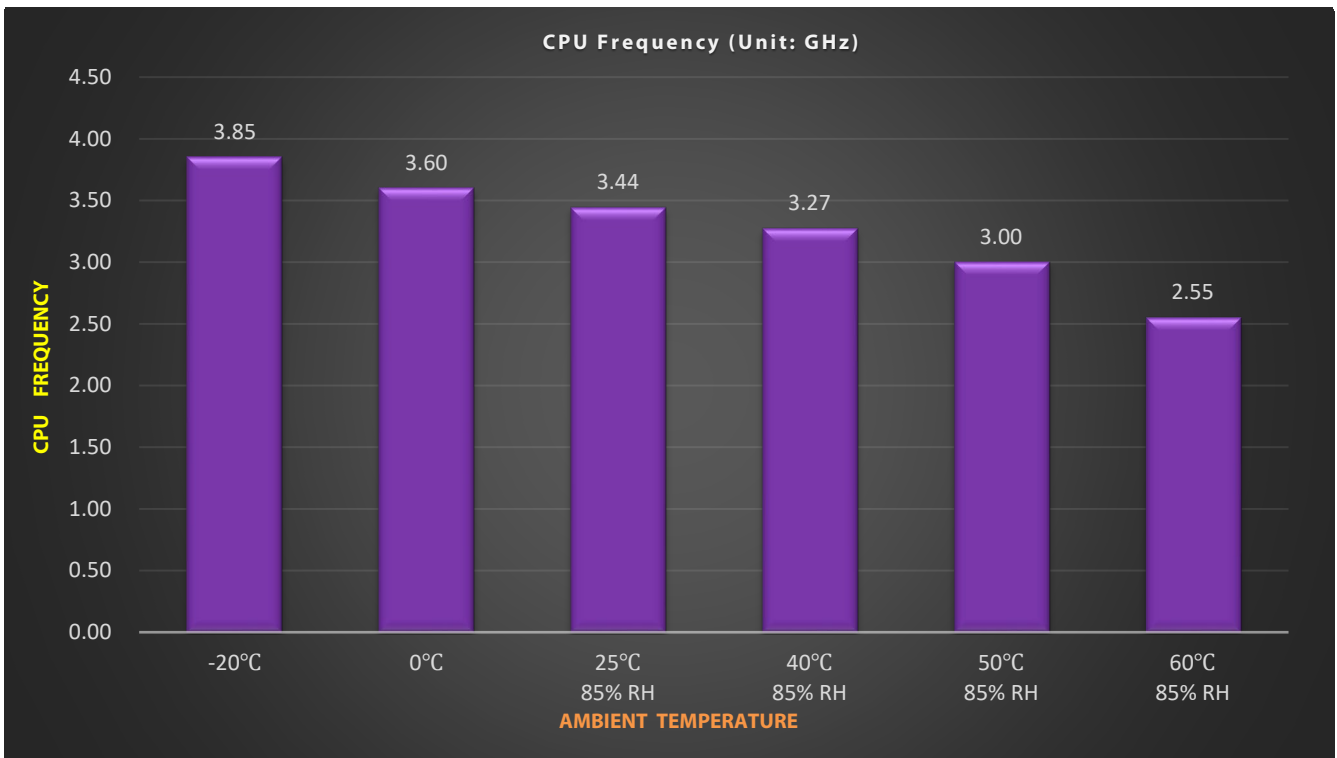
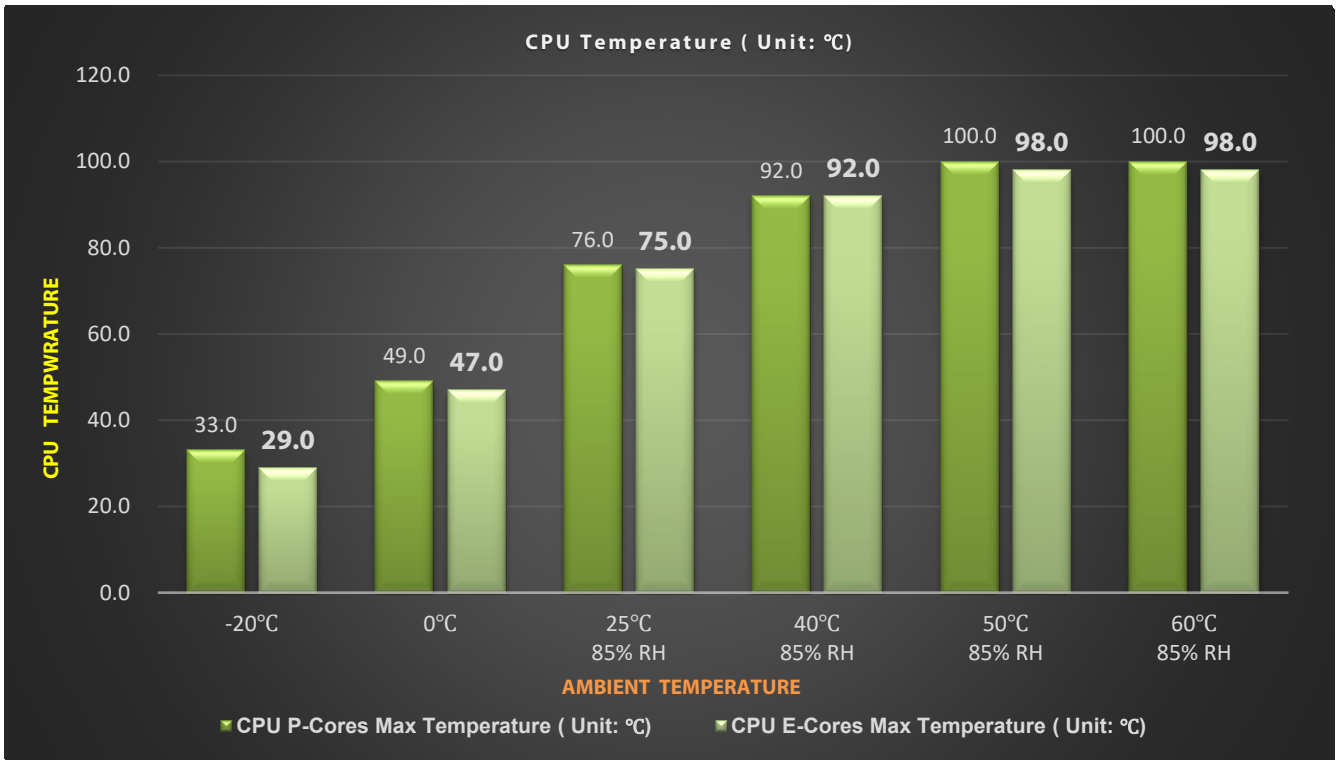
- Chamber in 60°C / 85%RH



4. THERMAL TEST RESULT(-20°C ~ +60°C)

CPU Temperature and Frequency

Temperature	Ambient Temp.	-20°C	0°C	25°C 85% RH	40°C 85% RH	50°C 85% RH	60°C 85% RH
Frequency							
CPU P-Cores Max Temperature (Unit: °C)		33.0	49.0	76.0	92.0	100.0	100.0
CPU E-Cores Max Temperature (Unit: °C)		29.0	47.0	75.0	92.0	98.0	98.0
CPU Frequency (Unit: GHz)		3.85	3.60	3.44	3.27	3.00	2.55

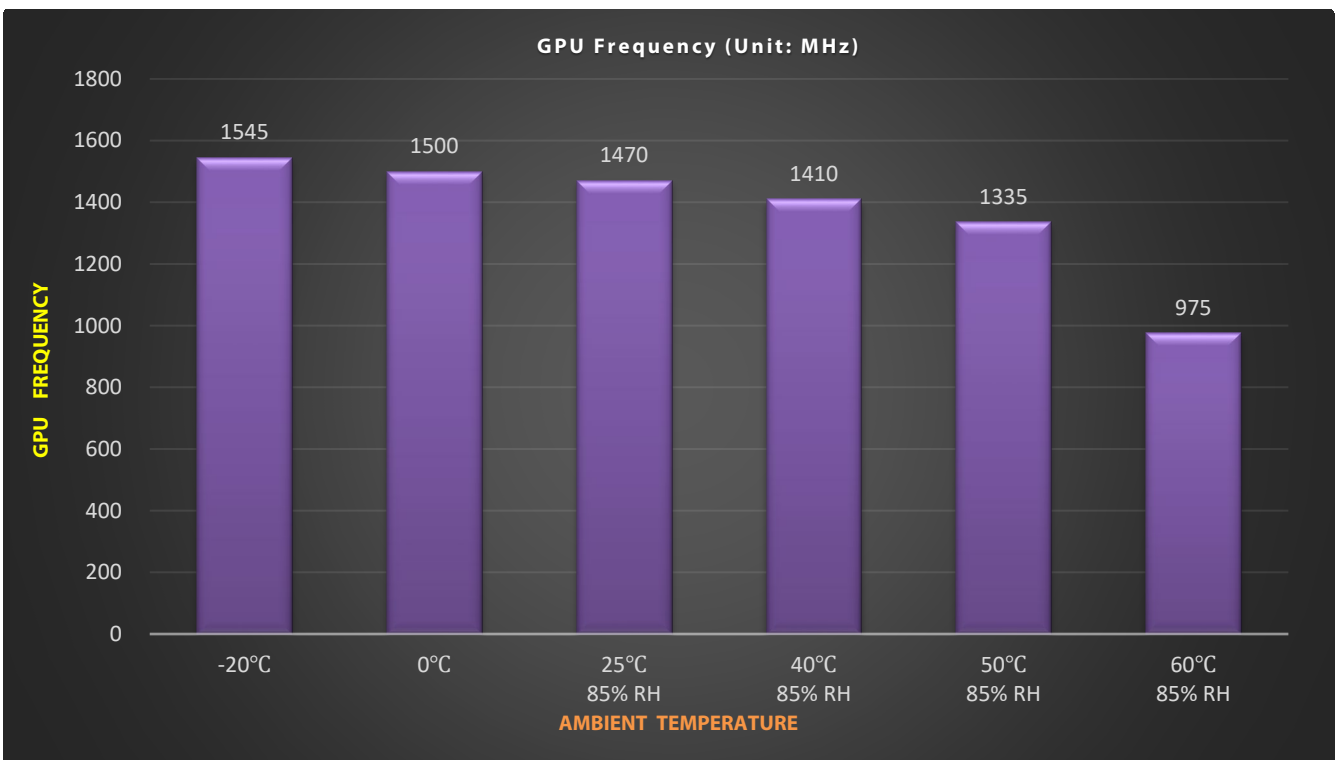
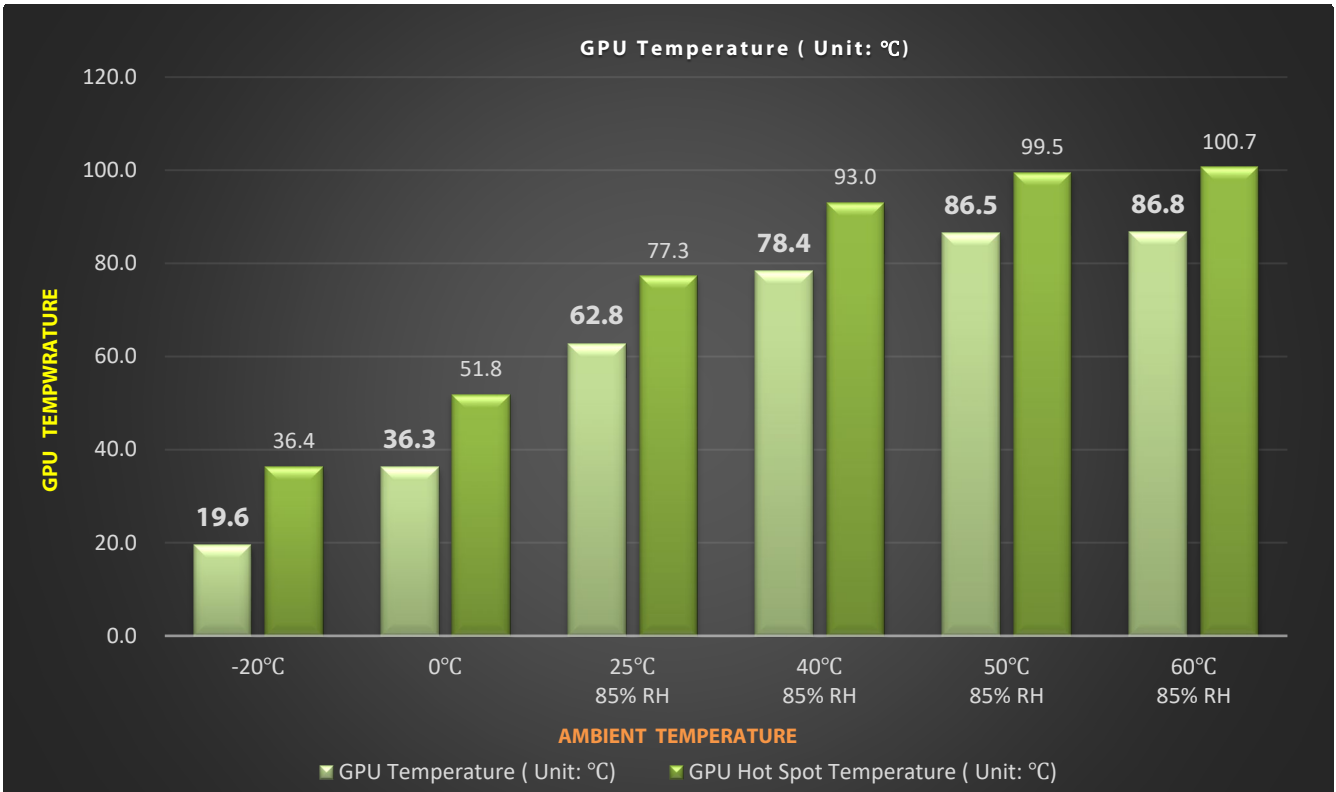


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GPU Temperature and Frequency

Temperature	Ambient Temp.	-20°C	0°C	25°C 85% RH	40°C 85% RH	50°C 85% RH	60°C 85% RH
GPU Temperature (Unit: °C)		19.6	36.3	62.8	78.4	86.5	86.8
GPU Hot Spot Temperature (Unit: °C)		36.4	51.8	77.3	93.0	99.5	100.7
GPU Frequency (Unit: MHz)		1545	1500	1470	1410	1335	975



5. I/O FUNCTION TEST

5-1. USB 3.0



PassMark(TM) USB3Test

Select USB Device



Device: PMU33ZQ2CX (SuperSpeed 5Gb/s)

Connection Type: SuperSpeed 5Gb/s

Test mode

Loopback

Benchmark



Results Status: BENCHMARK test - Complete

Duration: 006h 00m 00s Operations: 0 Errors: 0

Read block 30023: 3372.1 Mb/s (421.5 MB/s)	Max. Rate 3373
Write block 30023: 2949.2 Mb/s (368.6 MB/s)	
Read block 30024: 3372.1 Mb/s (421.5 MB/s)	
Write block 30024: 2956.1 Mb/s (369.5 MB/s)	
Read block 30025: 3370.3 Mb/s (421.3 MB/s)	
Write block 30025: 2963.4 Mb/s (370.4 MB/s)	
Read block 30026: 3368.8 Mb/s (421.1 MB/s)	
Write block 30026: 2959.8 Mb/s (370.0 MB/s)	
OVERALL BENCHMARK RESULT:	
Test Start time: Thu Aug 1 13:59:41 2024	
Duration: 006h 00m 00s	
Total number of bytes written: 3828315 MB	
Total number of bytes read: 3828315 MB	
Maximum Write Data Rate: 3350.0 Mb/s (418.7 MB/s)	
Maximum Read Data Rate: 3373.6 Mb/s (421.7 MB/s)	
Minimum Write Data Rate: 2943.6 Mb/s (368.0 MB/s)	
Minimum Read Data Rate: 3366.0 Mb/s (420.7 MB/s)	
Average Write Data Rate: 3167.8 Mb/s (396.0 MB/s)	
Average Read Data Rate: 3372.2 Mb/s (421.5 MB/s)	
Average Data Rate: 3266.8 Mb/s (408.3 MB/s)	
Minimum Data Rate: 2943.6 Mb/s (368.0 MB/s)	

0 1000 2000 3000 4000 (Mb/s) R/W

Voltage 4.92V
Speed 5Gb/s

Duration 360 Minutes

Start Stop

Configure Flash LEDs

Clear Serial Save Log

Reset All Help

About Exit

5-2. USB 3.0



PassMark(TM) USB3Test

Select USB Device

Device: PMU33ZQ2CX (SuperSpeed 5Gb/s)

Connection Type: SuperSpeed 5Gb/s

Test mode

Loopback

Benchmark

PASSMARK SOFTWARE

Voltage 4.92V
Speed 5Gb/s

Duration: 360 Minutes

Start Stop

Configure Flash LEDs

Clear Serial Save Log

Reset All Help

About Exit

Results		Status: BENCHMARK test - Complete
Duration: 006h 00m 00s	Operations: 0	Errors: 0
Read block 30023:	3372.1 Mb/s (421.5 MB/s)	
Write block 30023:	2949.2 Mb/s (368.6 MB/s)	
Read block 30024:	3372.1 Mb/s (421.5 MB/s)	
Write block 30024:	2956.1 Mb/s (369.5 MB/s)	
Read block 30025:	3370.3 Mb/s (421.3 MB/s)	
Write block 30025:	2963.4 Mb/s (370.4 MB/s)	
Read block 30026:	3368.8 Mb/s (421.1 MB/s)	
Write block 30026:	2959.8 Mb/s (370.0 MB/s)	
OVERALL BENCHMARK RESULT:		
Test Start time: Wed Jul 31 15:20:26 2024		
Duration: 006h 00m 00s		
Total number of bytes written: 3828315 MB		
Total number of bytes read: 3828315 MB		
Maximum Write Data Rate: 3350.0 Mb/s (418.7 MB/s)		
Maximum Read Data Rate: 3373.6 Mb/s (421.7 MB/s)		
Minimum Write Data Rate: 2943.6 Mb/s (368.0 MB/s)		
Minimum Read Data Rate: 3366.0 Mb/s (420.7 MB/s)		
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Minimum Data Rate: 2943.6 Mb/s (368.0 MB/s)		

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5-5. CANBus (COM 5)



Fintek CANBus tool Version 24.01.12.00

About

CANBus Connect

CANBus Device: COM5

Baudrate | Filter Setting | Log Setting

Interval(ms): 1000

Log Clear

Data Log Off

Disconnect Stop

Send

Extended Mode (EFF) RTR Enable

Send

Length (DLC): 8 ID (HEX): 00000526 Data (HEX): 1A2A3B4C5D6E7F81

Log

Send Log

```
000000494:07/31 14:11:05 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000495:07/31 14:11:06 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000496:07/31 14:11:06 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000497:07/31 14:11:06 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000498:07/31 14:11:06 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000499:07/31 14:11:07 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000500:07/31 14:11:07 ID(SFF):0x526 Write 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
```

Send Flow

Current Flow: 1

Total Flow: 500

Receive Log

```
000000494:07/31 14:11:44 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000495:07/31 14:11:45 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000496:07/31 14:11:45 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000497:07/31 14:11:45 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000498:07/31 14:11:46 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000499:07/31 14:11:46 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
000000500:07/31 14:11:47 ID(SFF):0x52E Read 8 Bytes: 11 22 33 44 55 66 77 88
```

Receive Flow

Current Flow: 0

Total Flow: 500

	Error Code	REC	TEC	Arb Lost	Error Pass	Overrun	Err Warn	SW Overrun
Count	0	0	0	0	0	0	0	0

5-6. CANBus (COM 6)



Fintek CANBus tool Version 24.01.12.00

About

CANBus Connect

CANBus Device: COM6

Buttons: Disconnect, Stop

Baudrate | Filter Setting | Log Setting

Interval(ms): 1000

Log Clear

Data Log Off

Send

Extended Mode (EFF) RTR Enable

Length (DLC): 8 ID (HEX): 0000052E Data (HEX): 1122334455667788

Send

Log

Send Log

```

000000494:07/31 14:11:44 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000495:07/31 14:11:44 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000496:07/31 14:11:44 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000497:07/31 14:11:45 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000498:07/31 14:11:45 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000499:07/31 14:11:45 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
000000500:07/31 14:11:46 ID(SFF):0x52E Write 8 Bytes: 11 22 33 44 55 66 77 88
    
```

Send Flow

Current Flow: 1

Total Flow: 500

Receive Log

```

000000494:07/31 14:11:06 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000495:07/31 14:11:06 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000496:07/31 14:11:07 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000497:07/31 14:11:07 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000498:07/31 14:11:07 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000499:07/31 14:11:07 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
000000500:07/31 14:11:08 ID(SFF):0x526 Read 8 Bytes: 1A 2A 3B 4C 5D 6E 7F 81
    
```

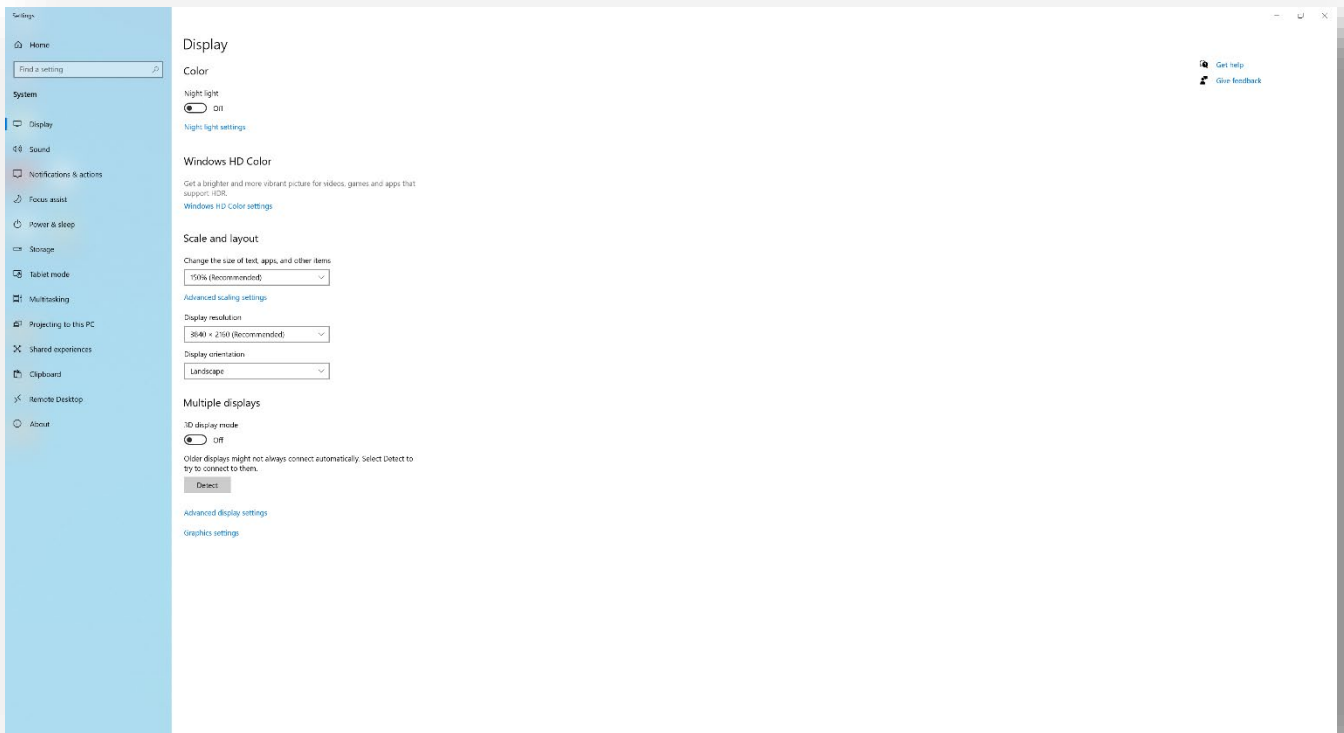
Receive Flow

Current Flow: 0

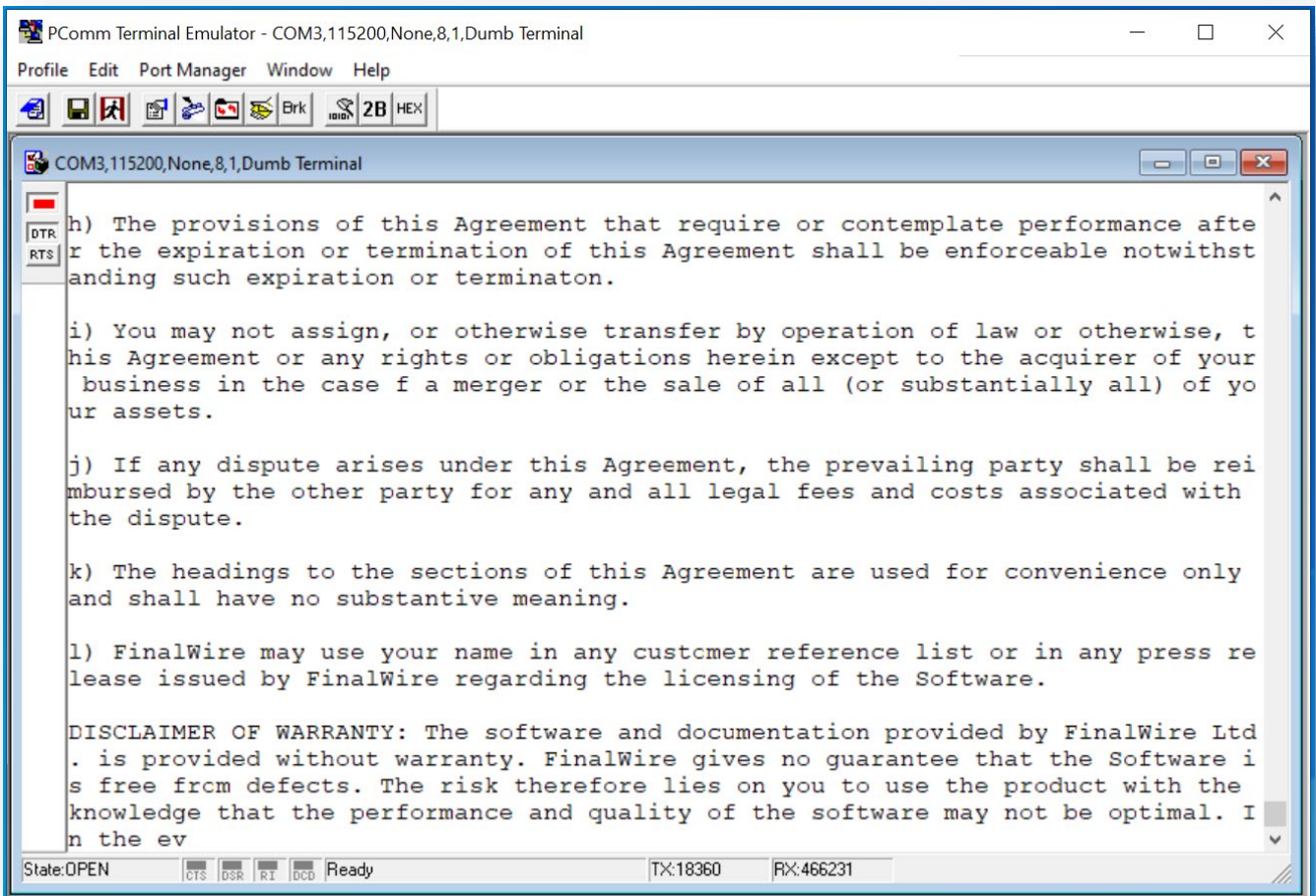
Total Flow: 500

	Error Code	REC	TEC	Arb Lost	Error Pass	Overrun	Err Warn	SW Overrun
Count	0	0	0	0	0	0	0	0

5-7. MINI DISPLAY PORT



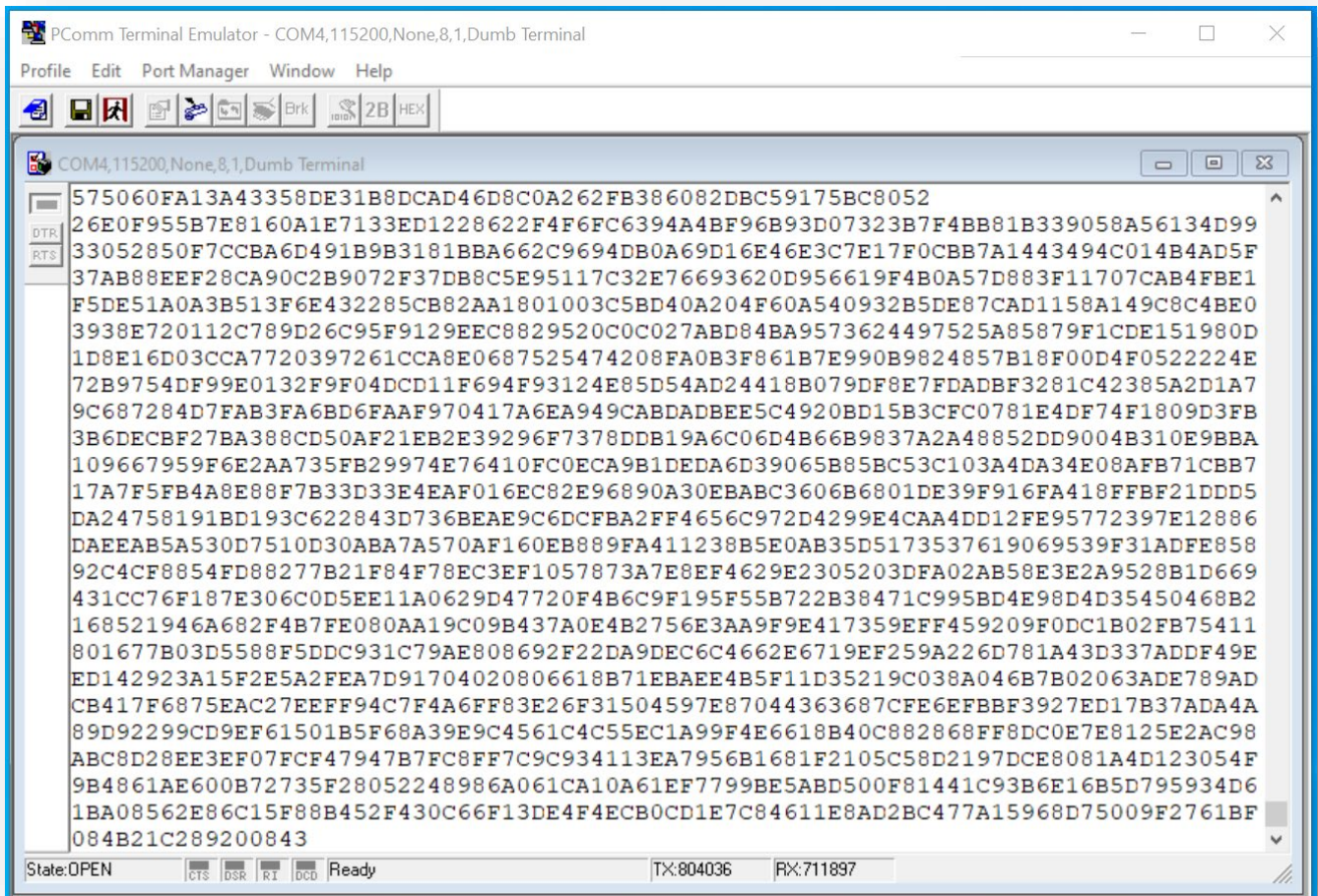
5-8. SERIAL PORT RS485 (COM 3)



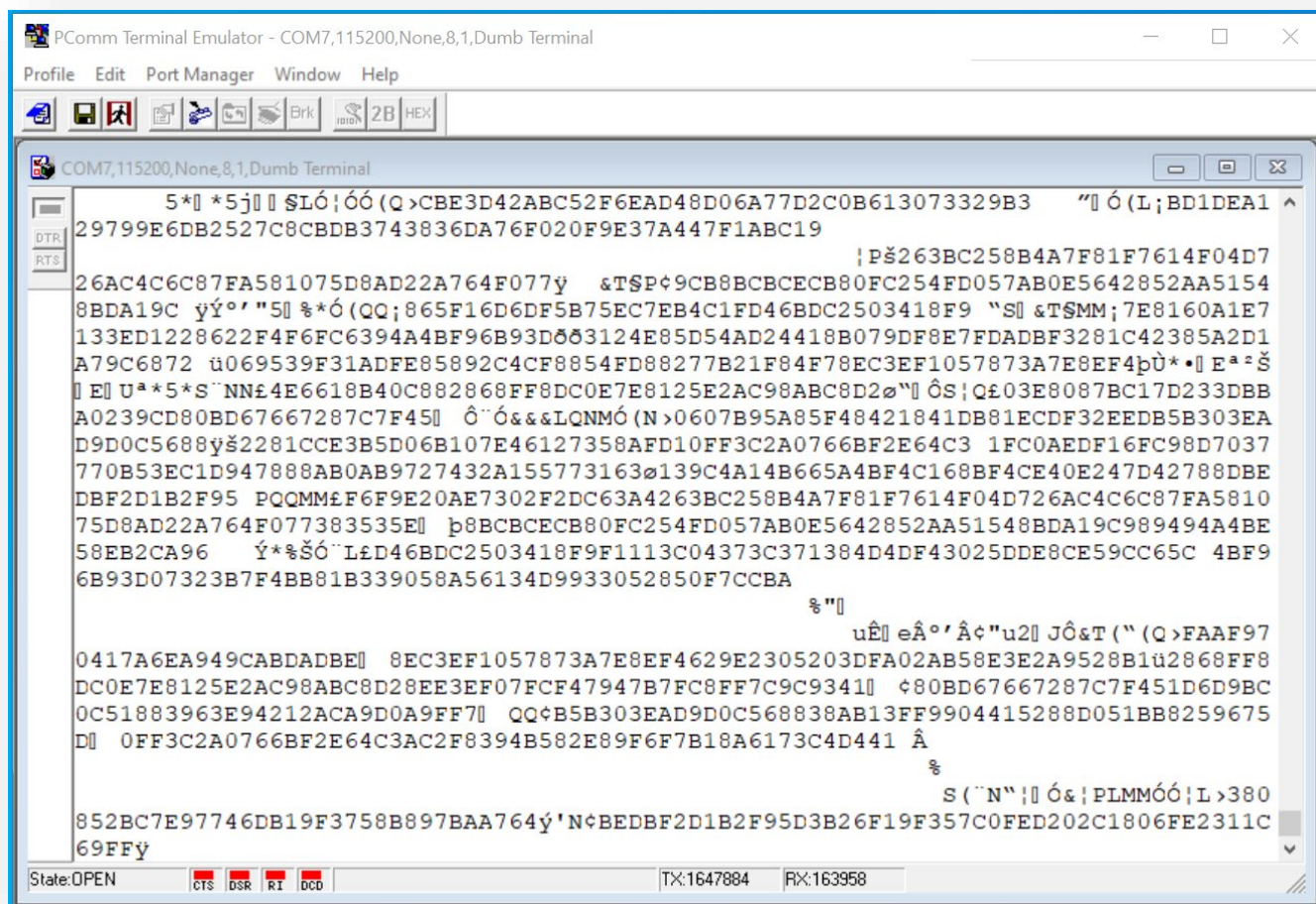
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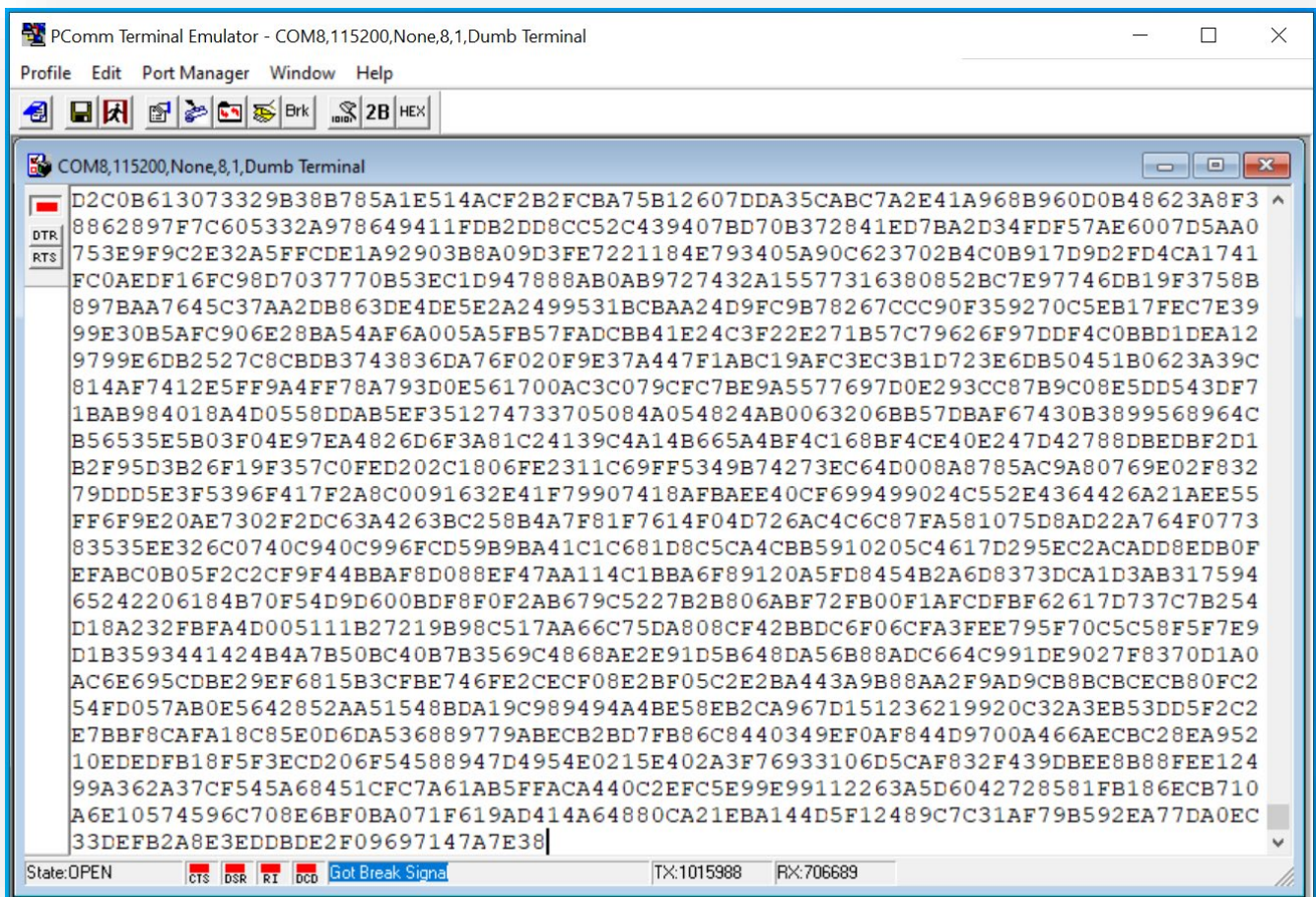
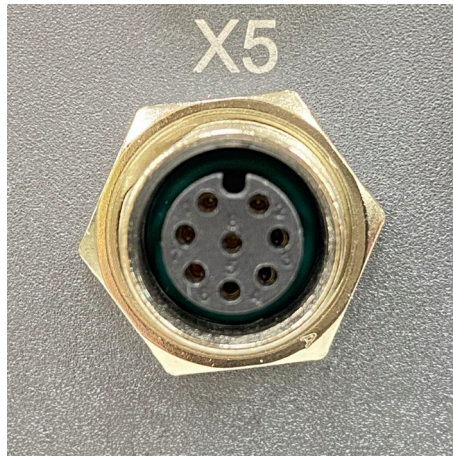
5-9. SERIAL PORT RS485 (COM 4)



5-10. SERIAL PORT RS485 (COM 7)



5-11. SERIAL PORT RS485 (COM 8)



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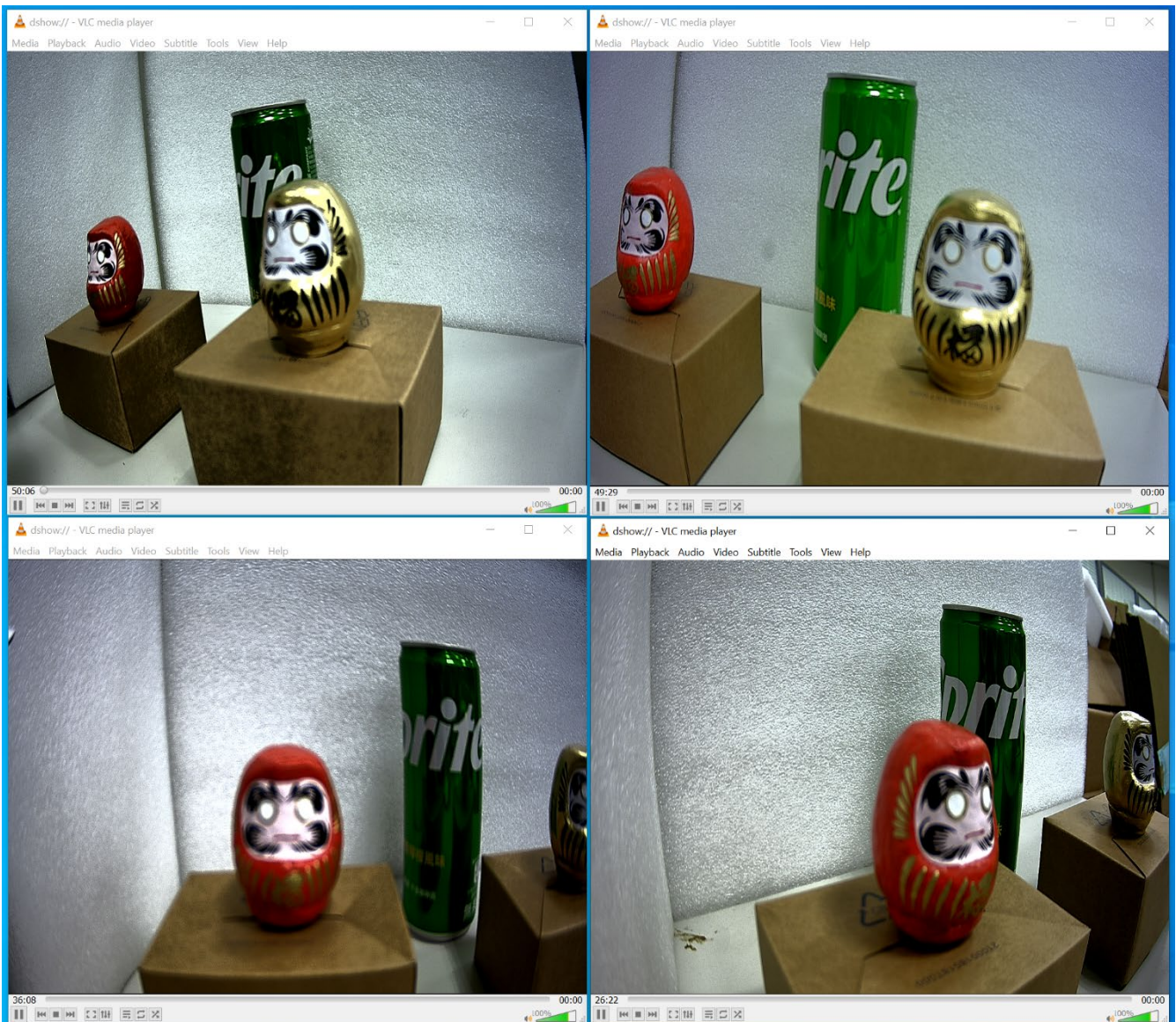
5-12. 3G-SDI (Port 1,3,5,7)



Outgoing Quality Inspection

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5-13. 3G-SDI (Port 2,4,6,8)



6. COSMETIC INSPECTION

No.	Result			Inspection items	Remark
	OK	NG	NA		
1	✓			Whether there are Scratch mark on the appearance?	
2	✓			Whether the cutting edge is oxidized in appearance?	
3	✓			Whether there are impact scars on the appearance?	
4	✓			Whether there is any burr on the exterior?	
5	✓			Whether there is a deformation in the appearance?	
6	✓			Is there any dirt or glue residue on the outside?	
7	✓			Is the baking paint peeling or spilled on the appearance?	
8	✓			Is the version of the nameplate correct and not skewed or warped?	
9	✓			Is the serial number version sticker affixed and is the version correct?	
10	✓			HDD CAGE/TRAY trial installation and actual configuration to confirm whether there is interference?	

Cosmetic Inspection Photo

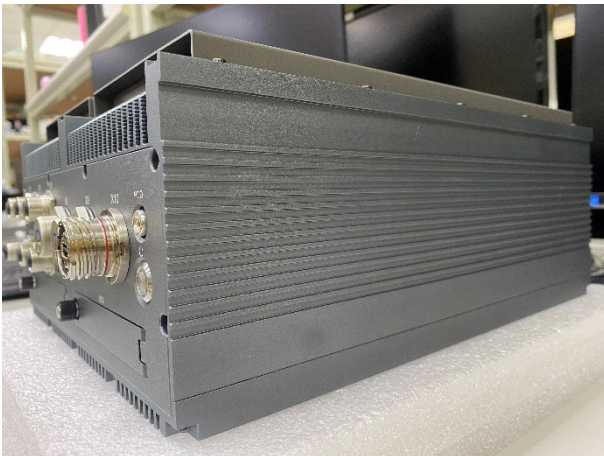
FRONT SIDE



BACK SIDE



LEFT SIDE



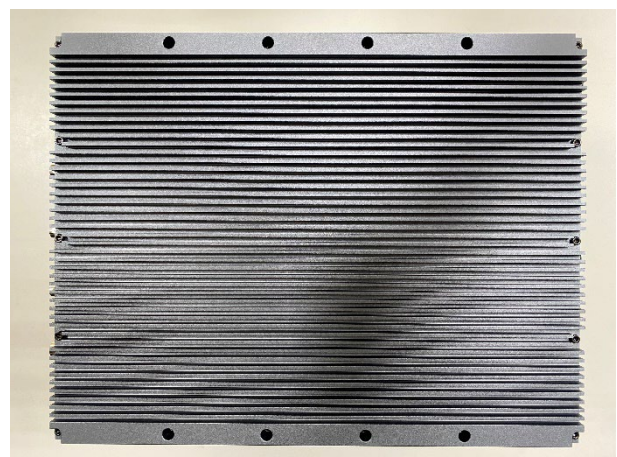
RIGHT SIDE



TOP SIDE



BOTTOM SIDE



Outgoing Quality Inspection

IV320-KS-KD

FRONT LEFT CORNER



FRONT RIGHT CORNER



BACK LEFT CORNER



BACK RIGHT CORNER

