



# PRODUCT OUTGOING QUALITY INSPECTION REPORT

## NV200-2LGS16

S/N: SR202408120301

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# Outgoing Quality Inspection

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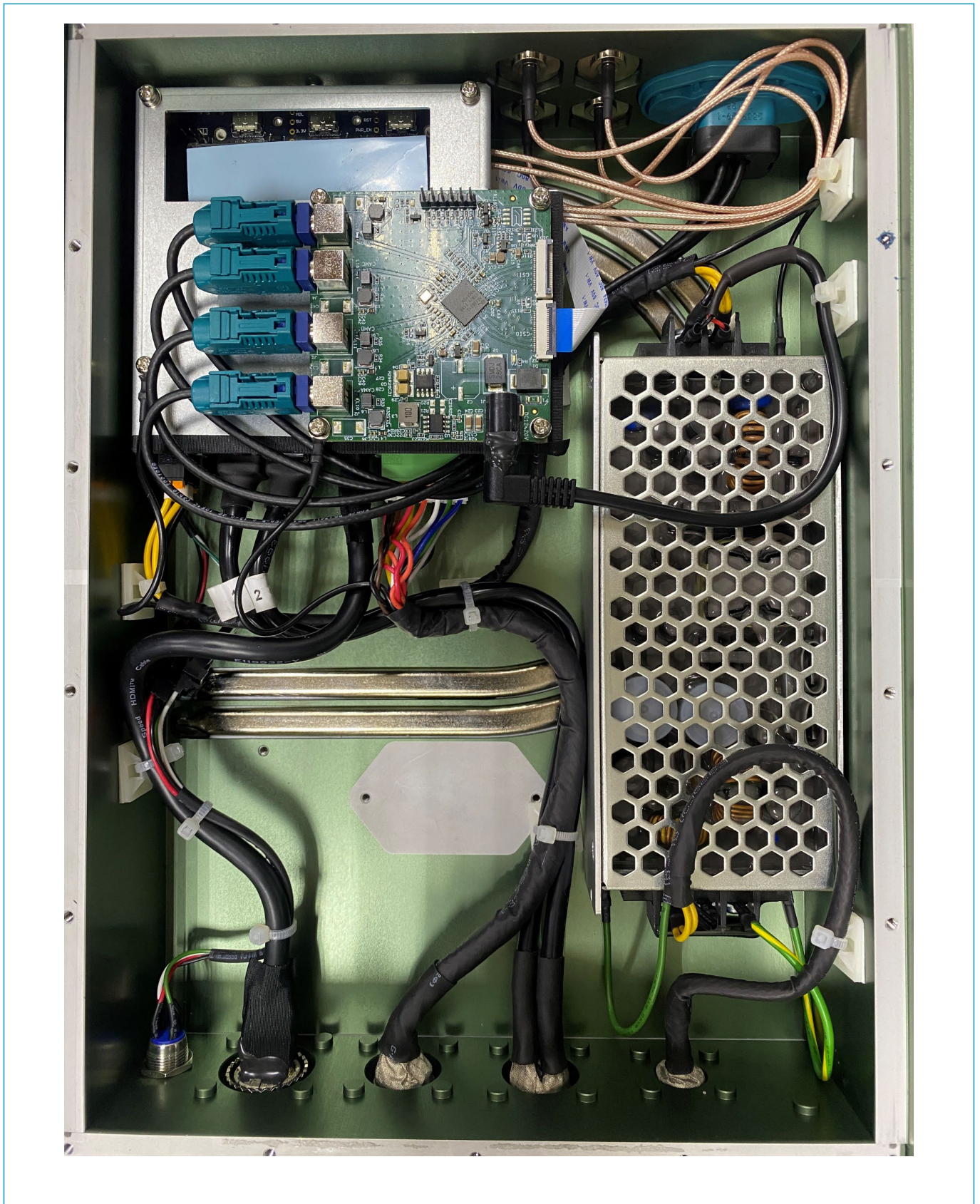
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# 1. SPECIFICATION

## 1-1. SYSTEM CONFIGURATION

<b>Motherboard</b>	<b>Orin NX 16GB for DSBOARD-ORNX</b> <b>Board Serial Number: 1422424333981</b> <b>BIOS Firmware Version: 36.3.0-gcid-36191598</b>
<b>CPU</b>	<b>Product: ARMv8</b> <b>Vendor: NVIDIA</b> <b>Model name: Cortex-A78AE</b> <b>CPU max (MHz): 1984.0</b> <b>CPU min (MHz): 115.2</b>
<b>Memory</b>	<b>ONX 16GB (2x 8GB) memory with 128bit LPDDR5 DRAM</b>
<b>Storage</b>	<b>M.2 NVMe SSD</b> <b>product: SP010TIMEM3M5EVO</b> <b>Flash Technology: 3D TLC</b> <b>Size: 1TB</b> <b>Operating Temp. (Standard): -20°C~75°C</b>
<b>GMSL</b>	<b>GMSL Multimedia controller Module</b>
<b>SDI</b>	<b>GMSL Multimedia controller Module</b>

1-2. PRODUCT INTERIOR PHOTOS



## 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: Stress-ng 2. Stress GPU: glmark2 3. LAN Speed: iPerf</p>
<p>Test Procedure</p>	<p>1. Thermal pre-scan measurement: Temperature: <b>-20°C ~60°C</b> Humidity: <b>85%RH</b></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 Ubuntu 22.04.5 LTS 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>3. For the Operating system software compatibility testing: 3-1. open the thermal chamber and power on the device under test. Enter the Ubuntu 24.02 LTS environment and perform the maximum power test and stress test.</p>
<p>Test Diagram of Curves</p>	<p>Environment defines for 66 hours.</p>

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### 2-2. TEST RESULT

#### 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
<b>LAN Port</b> (1Gbps)	Connecting to a LAN switch/hub for data transmission test works properly.	<b>PASS</b>
<b>LAN Port</b> (1Gbps)	Connecting to a LAN switch/hub for data transmission test works properly.	<b>PASS</b>
<b>Serial Port</b> (RS232)	The two devices RS232 are connected to each other, and the data transmission test shows no loss, functioning properly.	<b>PASS</b>
<b>Serial Port</b> (RS422/485)	The two devices RS422/485 are connected to each other, and the data transmission test shows no loss, functioning properly.	<b>PASS</b>
<b>CANBus</b>	The two devices' CAN Bus are connected to each other, and the data transmission test shows no loss, functioning properly.	<b>PASS</b>
<b>Type-C</b>	Connect a PassMark USB 3.0 Loopback Plugs for testing, it can work normally.	<b>PASS</b>
<b>Type-C</b>	Connect a PassMark USB 3.0 Loopback Plugs for testing, it can work normally.	<b>PASS</b>
<b>HDMI</b>	Check work well. (Resolution:1920 x 1080)	<b>PASS</b>
<b>SDI</b>	Connecting the SDI camera will display the captured objects on the monitor, indicating that the SDI function is working properly.	<b>PASS</b>
<b>GMSL</b>	Connecting the GMSL camera will display the captured objects on the monitor, indicating that the GMSL function is working properly.	<b>PASS</b>



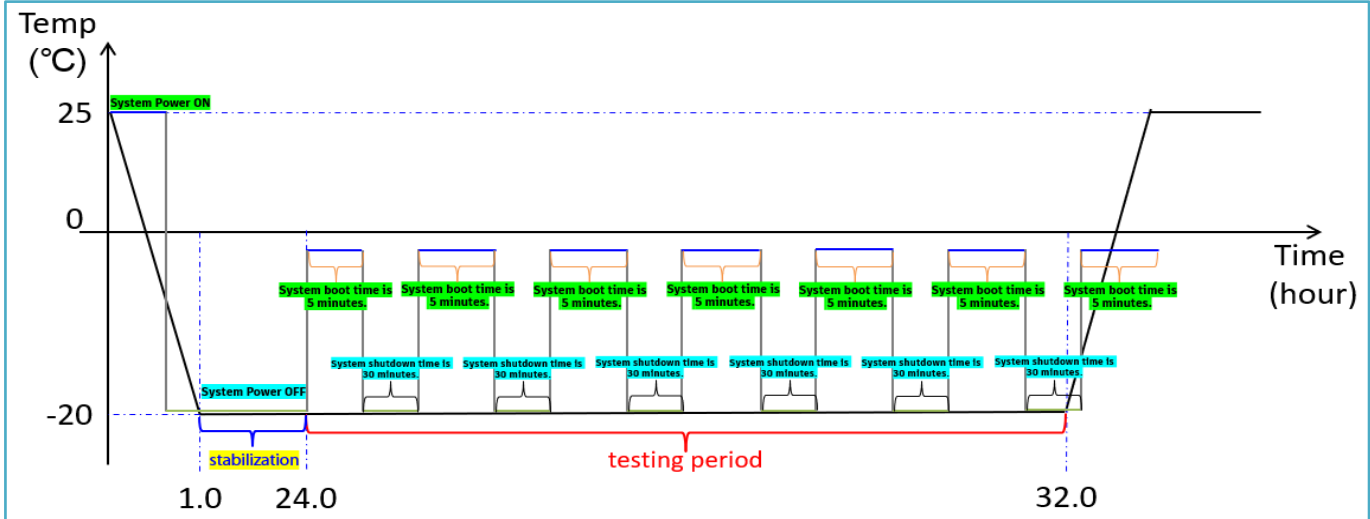
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### 2-2-3. Low-temperature & Boot-up

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

Ambient Temp.	Cold Boot Test Times	Test Result
-20°C	10 times	PASS



### 3. TEST PHOTO IN LAB

- Chamber in -20°C

The screenshot displays the Jetson Power GUI interface for an Orin NX 16GB device. The main window shows various system metrics:

CPU		
Name	Freq (MHz)	Load %
cpu0	1497.6	100
cpu1	1497.6	100
cpu2	1497.6	100
cpu3	1497.6	100
cpu4	1497.6	100
cpu5	1497.6	100
cpu6	1497.6	100
cpu7	1497.6	98

GPU		
Name	Freq (MHz)	Load %
lgpu0	612.0	88

EMC		
Name	Freq (MHz) / Size (MB)	Load %
emc	204.0 MHz	176 %
memory	9082/15656 MB	58 %
swap	743/7828 MB	9 %

Sensor	
Name	Temperature (C)
cpu-thermal	-6.2
cv0-thermal	-6.9
cv1-thermal	-8.6
cv2-thermal	-9.4
gpu-thermal	-8.7
soc0-thermal	-7.8
soc1-thermal	-6.8
soc2-thermal	-6.8
tj-thermal	-6.2

Power Monitor		
Name	Inst (mW)	Avg (mW)
VDD IN	11186	10551
VDD CPU	4245	3801
VDD GPU	2543	2477
VDD SOC		

Fan	
Name	Profile
fan1	quiet
	PWM 0.0 %
	RPM 0 rpm

Disk	
Size	
9990/1005443 MB	

The terminal window shows the execution of stress tests:

```
root@NV200: /home/user
^C^Cstress-ng: info: [5219] successful run completed in 102.96s (1 min, 42.96 s
root@NV200: /home/user# stress-ng --cpu 0 --cpu-load 100 --vm 0 --vm-byte 8G
stress-ng: info: [6693] defaulting to a 86400 second (1 day, 0.00 secs) run per
stress-ng: info: [6693] dispatching hogs: 8 cpu, 8 vm
```

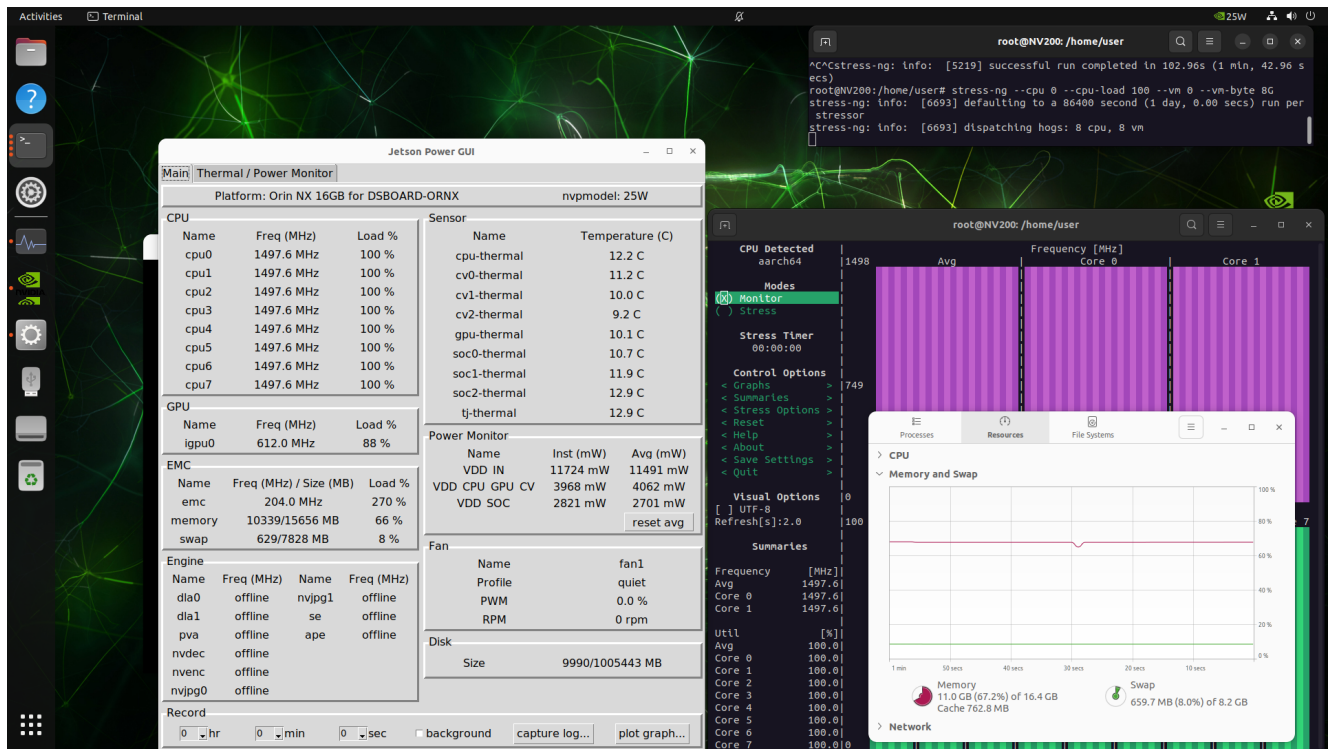
Another terminal window shows the stress-ng monitor interface with a stress timer at 00:00:00 and various control and visual options.



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### - Chamber in 0°C



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### - Chamber in 25°C

The screenshot displays the Jetson Power GUI interface on a Linux desktop. The main window shows system information for an Orin NX 16GB for DSBOARD-ORNXX with nvpmodel: 25W. It includes sections for CPU, GPU, EMC, Engine, Power Monitor, Fan, and Disk. A terminal window in the background shows the execution of stress-ng tests, with output indicating successful completion and resource usage.

Name	Freq (MHz)	Load %	Sensor Name	Temperature (C)
cpu0	1497.6	100	cpu-thermal	37.0
cpu1	1497.6	100	cv0-thermal	36.4
cpu2	1497.6	100	cv1-thermal	34.8
cpu3	1497.6	100	cv2-thermal	34.0
cpu4	1497.6	100	gpu-thermal	34.8
cpu5	1497.6	100	soc0-thermal	35.8
cpu6	1497.6	100	soc1-thermal	36.9
cpu7	1497.6	100	soc2-thermal	37.1
			tj-thermal	37.1

Name	Inst (mW)	Avg (mW)
VDD IN	11066	11414
VDD CPU GPU CV	3888	4043
VDD SOC	2464	2638

Name	Freq (MHz)	Load %
igpu0	612.0	88

Name	Freq (MHz) / Size (MB)	Load %
emc	204.0 MHz	197
memory	14136/15656 MB	90
swap	781/7828 MB	10

Name	Profile	PWM	RPM
fan1	quiet	3.92	0

Name	Size
	9991/1005443 MB



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### - Chamber in 40°C

Terminal Output:

```
Example: stress-ng --cpu 8 --io 4 --vm 2 --vm-bytes 128M --fork 4 --timeout 10s
Note: Sizes can be suffixed with B,K,M,G and times with s,m,h,d,y
root@NV200:/home/user# stress-ng --cpu 0 --cpu-load 50 --vm 0 --vm-byte 12G
stress-ng: info: [5154] defaulting to a 86400 second (1 day, 0.00 secs) run per
stressor
stress-ng: info: [5154] dispatching hogs: 8 cpu, 8 vm
```

Jetson Power GUI - Thermal / Power Monitor

CPU			Sensor	
Name	Freq (MHz)	Load %	Name	Temperature (C)
cpu0	1420.8 MHz	100 %	cpu-thermal	53.8 C
cpu1	1420.8 MHz	100 %	cv0-thermal	53.2 C
cpu2	1420.8 MHz	100 %	cv1-thermal	50.7 C
cpu3	1420.8 MHz	100 %	cv2-thermal	49.3 C
cpu4	1420.8 MHz	100 %	gpu-thermal	50.4 C
cpu5	1420.8 MHz	100 %	soc0-thermal	50.8 C
cpu6	1420.8 MHz	100 %	soc1-thermal	52.7 C
cpu7	1420.8 MHz	100 %	soc2-thermal	52.7 C
			tj-thermal	53.8 C

Power Monitor:

Name	Inst (mW)	Avg (mW)
VDD IN	12598 mW	12302 mW
VDD CPU GPU CV	5070 mW	4998 mW
VDD SOC	2424 mW	2406 mW

htop Summary:

```
Temp Tmp102_0 58.1
Frequency Avg 1702.4
Core 0 1420.8 100
Core 1 1984.0 100
Core 2 100.0 0
Core 3 100.0 0
Core 4 100.0 0
Core 5 100.0 0
Core 6 100.0 0
Core 7 100.0 0
```



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## NV200-2LGS16

### - Chamber in 50°C

The screenshot shows the Jetson Power GUI interface and terminal windows. The GUI displays system metrics for an Orin NX 16GB device. The terminal shows the execution of stress-ng, which is running a CPU stress test.

CPU			Sensor	
Name	Freq (MHz)	Load %	Name	Temperature (C)
cpu0	1420.8 MHz	100 %	cpu-thermal	66.2 C
cpu1	1420.8 MHz	100 %	cv0-thermal	65.5 C
cpu2	1420.8 MHz	100 %	cv1-thermal	63.4 C
cpu3	1420.8 MHz	100 %	cv2-thermal	62.1 C
cpu4	1420.8 MHz	100 %	gpu-thermal	63.6 C
cpu5	1420.8 MHz	100 %	soc0-thermal	63.7 C
cpu6	1420.8 MHz	100 %	soc1-thermal	65.2 C
cpu7	1420.8 MHz	100 %	soc2-thermal	65.3 C
			tj-thermal	66.2 C

GPU		
Name	Freq (MHz)	Load %
lgu0	612.0 MHz	88 %

EMC		
Name	Freq (MHz) / Size (MB)	Load %
emc	204.0 MHz	257 %
memory	14426/15656 MB	92 %
swap	355/7828 MB	5 %

Fan		
Name	Profile	RPM
fan1	quiet	100.0 %
	PWM	100.0 %
	RPM	0 rpm

Power Monitor		
Name	Inst (mW)	Avg (mW)
VDD IN	14228 mW	12716 mW
VDD CPU GPU CV	6367 mW	5250 mW
VDD SOC	2623 mW	2445 mW

Disk		
Name	Size	
	9993/1005443 MB	

```

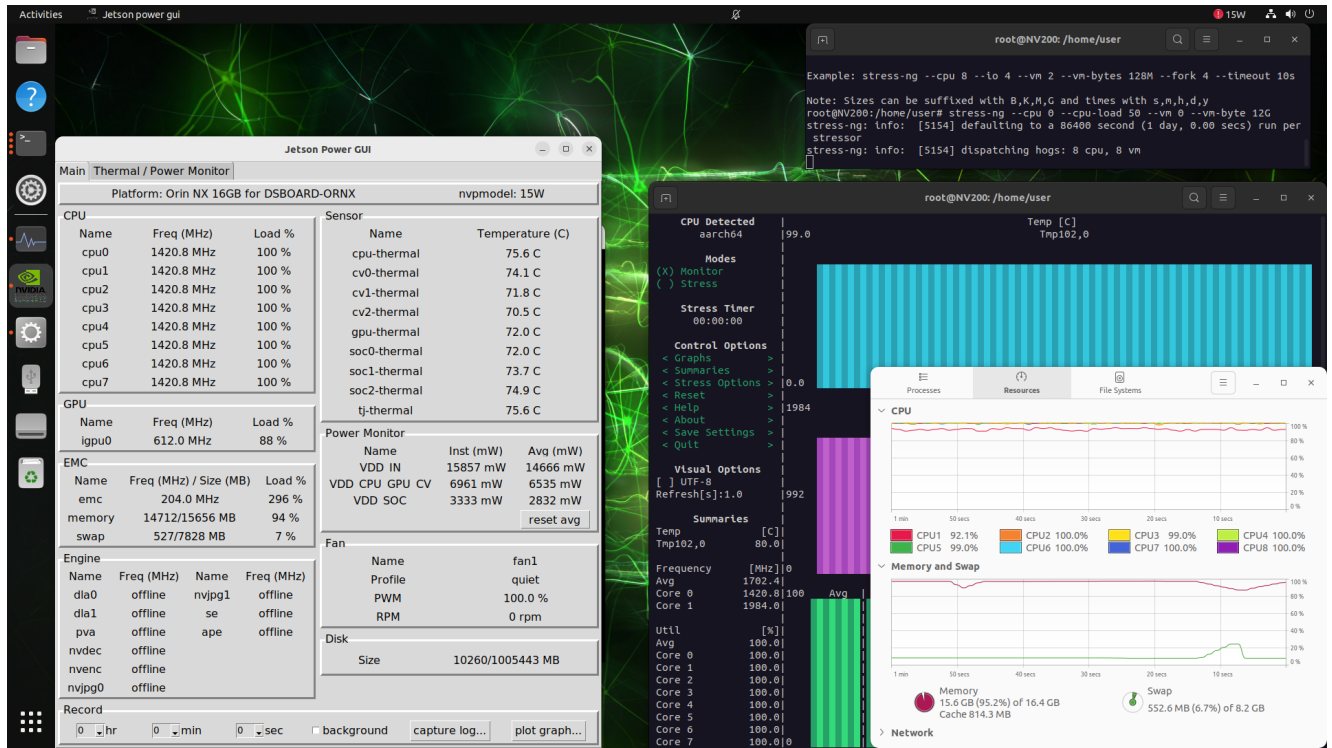
Example: stress-ng --cpu 8 --io 4 --vm 2 --vm-bytes 128M --fork 4 --timeout 10s
Note: Sizes can be suffixed with B,K,M,G and times with s,m,h,d,y
root@NV200:/home/user# stress-ng --cpu 0 --cpu-load 50 --vm 0 --vm-byte 12G
stress-ng: info: [5154] defaulting to a 86400 second (1 day, 0.00 secs) run per
stress-ng: info: [5154] dispatching hogs: 8 cpu, 8 vm
    
```



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## NV200-2LGS16

### - Chamber in 60°C



## 4. THERMAL TEST RESULT(-20°C ~ +60°C)

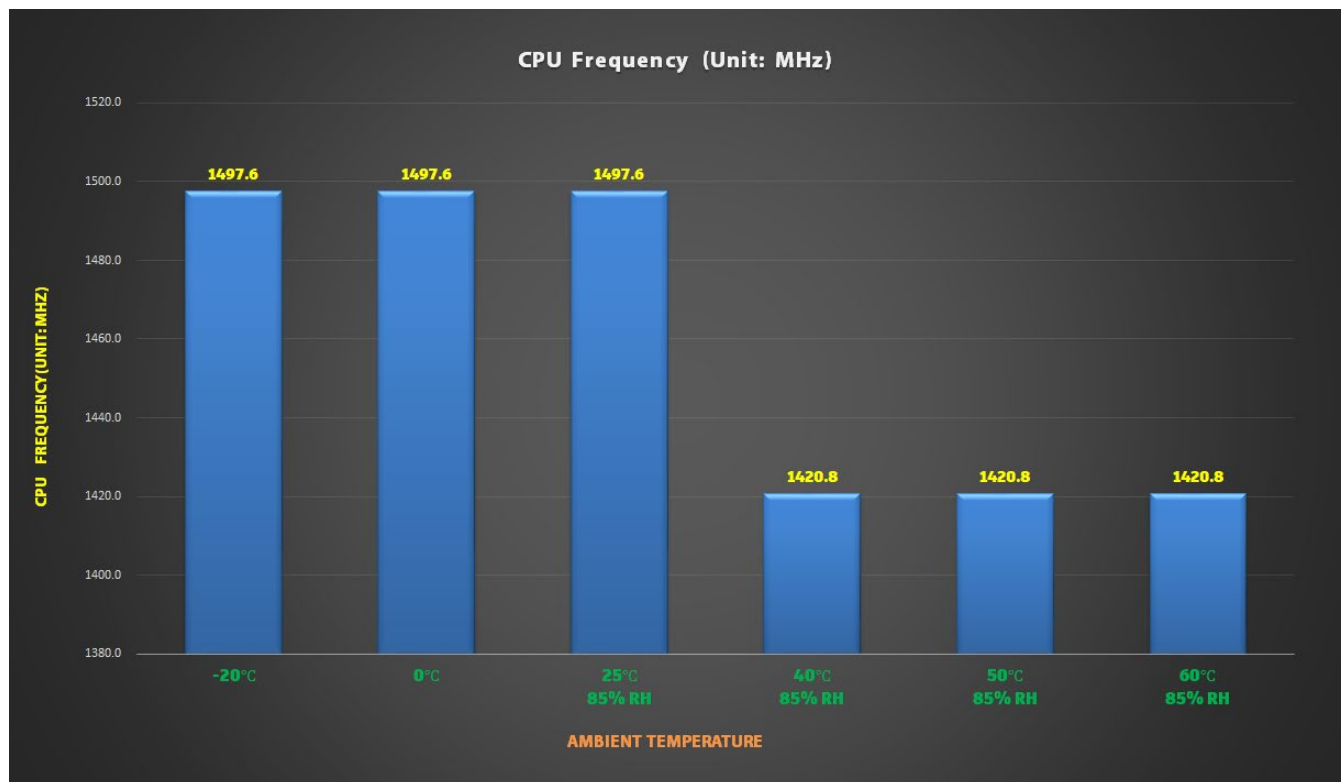
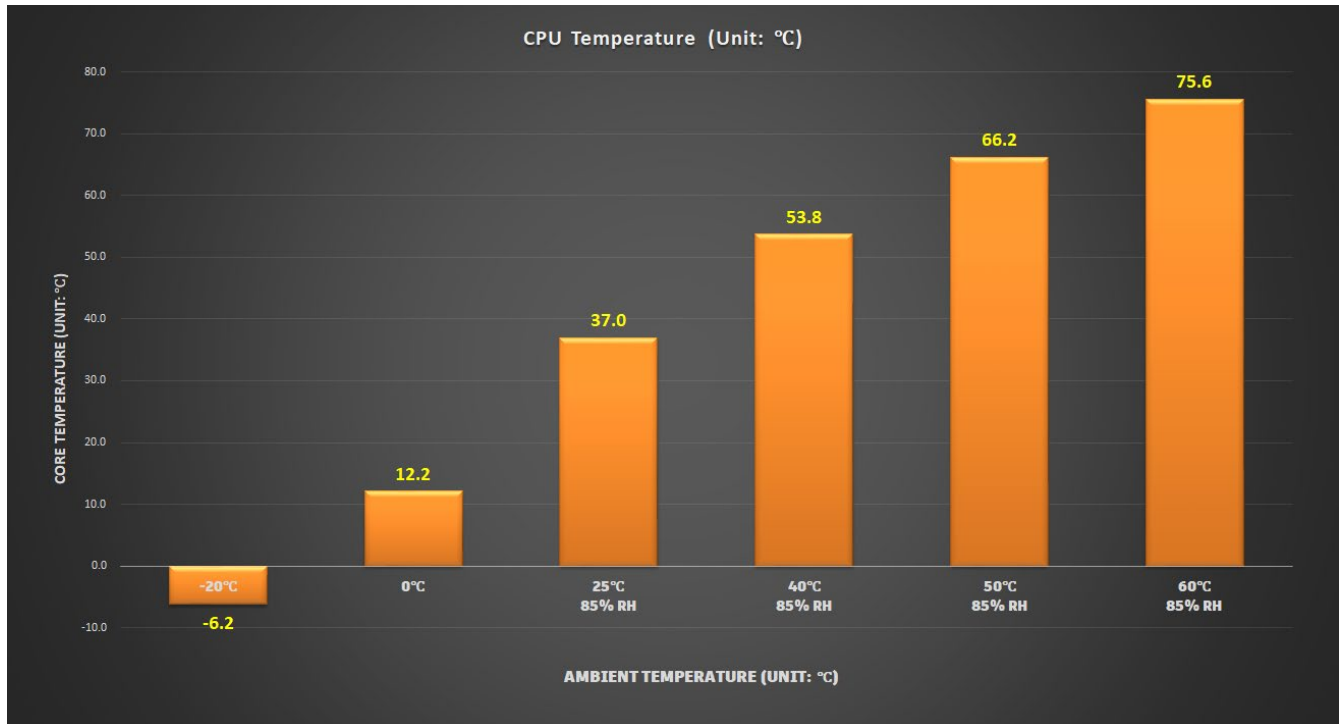
CPU & GPU Temperature and Frequency

Temperature Ambient Temp.	-20°C	0°C	25°C 85% RH	40°C 85% RH	50°C 85% RH	60°C 85% RH
CPU Temperature ( Unit: °C)	-6.2	12.2	37.0	53.8	66.2	75.6
CPU Frequency (Unit: MHz)	1497.6	1497.6	1497.6	1420.8	1420.8	1420.8
GPU Temperature ( Unit: °C)	8.7	10.1	34.8	50.4	63.6	72.0
GPU Frequency (Unit: MHz)	612.0	612.0	612.0	612.0	612.0	612.0



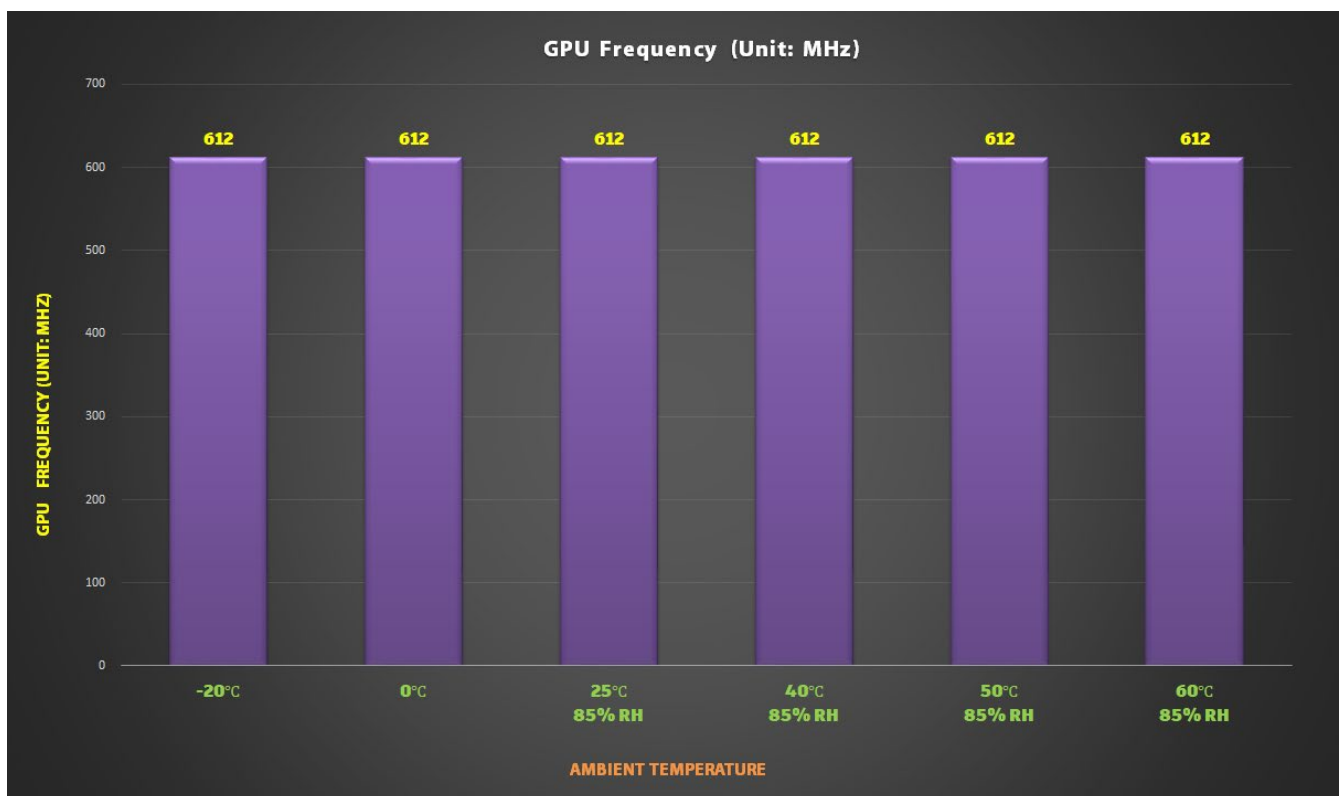
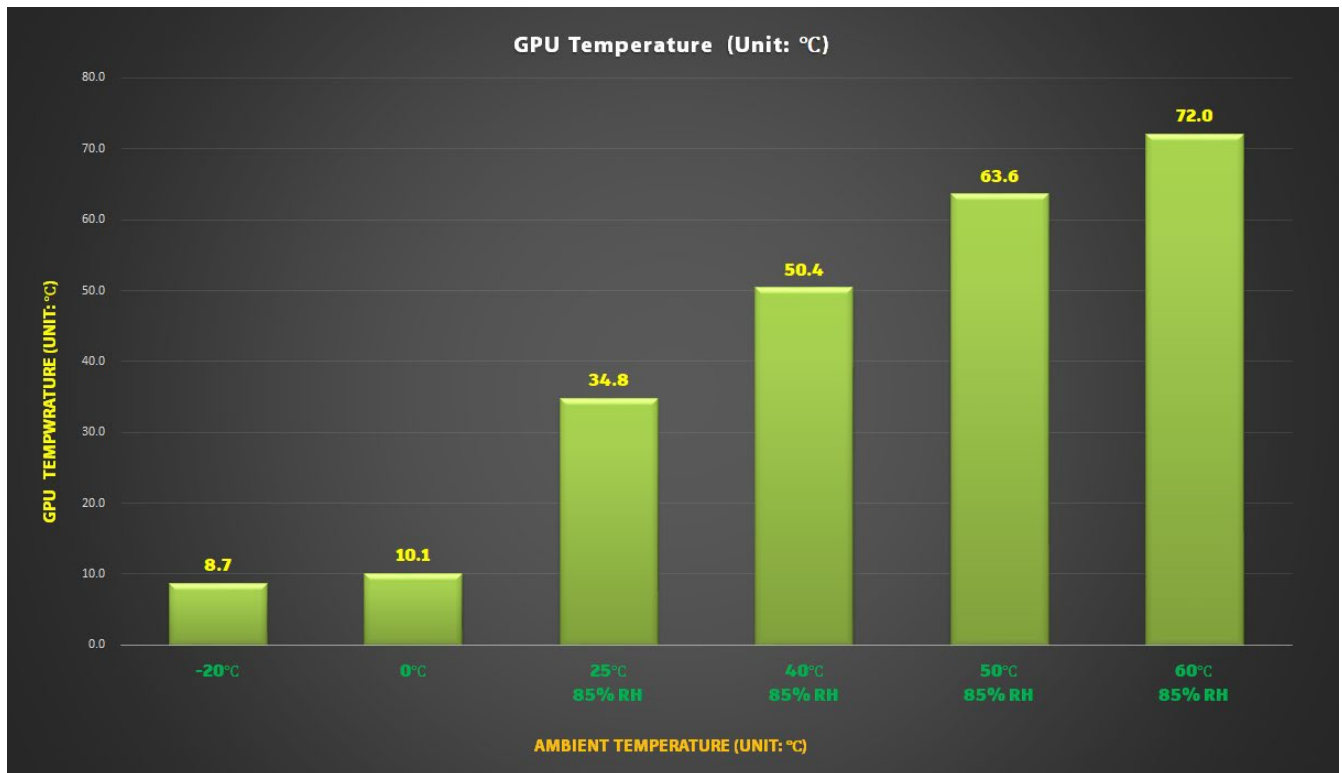
# Outgoing Quality Inspection

## NV200-2LGS16



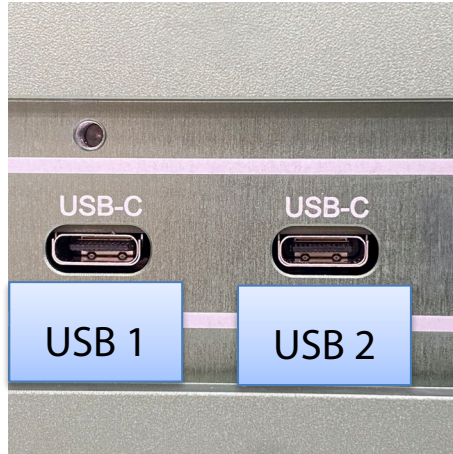
# Outgoing Quality Inspection

## NV200-2LGS16



# 5. I/O FUNCTION TEST

## 5-1. USB 3.0



USB 1

**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: 000h 10m 00s    Operations: 0    Errors: 0

Write block 805: 3368.7 Mb/s (421.1 MB/s)
Read block 806: 3369.0 Mb/s (421.1 MB/s)
Write block 806: 3371.3 Mb/s (421.4 MB/s)
Read block 807: 3368.7 Mb/s (421.1 MB/s)
Write block 807: 3370.8 Mb/s (421.4 MB/s)
Read block 808: 3364.1 Mb/s (420.5 MB/s)
Write block 808: 3371.9 Mb/s (421.5 MB/s)
Read block 809: 3369.7 Mb/s (421.2 MB/s)
<b>OVERALL BENCHMARK RESULT:</b>
Test Start time:
Duration: 000h 10m 00s
Total number of bytes written: 103020 MB
Total number of bytes read: 103147 MB
Maximum Write Data Rate: 3372.5 Mb/s (421.6 MB/s)
Maximum Read Data Rate: 3372.7 Mb/s (421.6 MB/s)
Minimum Write Data Rate: 3087.2 Mb/s (385.9 MB/s)
Minimum Read Data Rate: 3362.6 Mb/s (420.3 MB/s)
Average Write Data Rate: 3369.9 Mb/s (421.2 MB/s)
Average Read Data Rate: 3369.2 Mb/s (421.2 MB/s)
Average Data Rate: 3369.6 Mb/s (421.2 MB/s)
Minimum Data Rate: 3087.2 Mb/s (385.9 MB/s)

Max. Rate

3372

4000

3000

2000

1000

0

(Mb/s)

R/W

Voltage 4.98V  
Speed 5Gb/s

Duration  Minutes

Start

Stop

Configure

Flash LEDs

Clear Serial

Save Log

Reset All

Help

About

Exit

# Outgoing Quality Inspection

## NV200-2LGS16

USB 2

PassMark(TM) USB3Test

Select USB Device


Device: PMU33ZQ2DG (SuperSpeed 5Gb/s)

Connection Type: SuperSpeed 5Gb/s

Test mode

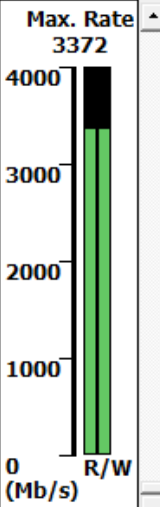
Loopback

Benchmark



**Results** Status: *BENCHMARK test - Complete*

Duration: 000h 30m 00s	Operations: 0	Errors: 0
Write block 2383: 3368.1 Mb/s (421.0 MB/s)		
Read block 2384: 3368.0 Mb/s (421.0 MB/s)		
Write block 2384: 3371.8 Mb/s (421.5 MB/s)		
Read block 2385: 3370.5 Mb/s (421.3 MB/s)		
Write block 2385: 3371.7 Mb/s (421.5 MB/s)		
Read block 2386: 3368.7 Mb/s (421.1 MB/s)		
Write block 2386: 3371.2 Mb/s (421.4 MB/s)		
Read block 2387: 3369.7 Mb/s (421.2 MB/s)		
<b>OVERALL BENCHMARK RESULT:</b>		
Test Start time:		
Duration: 000h 30m 00s		
Total number of bytes written: 304215 MB		
Total number of bytes read: 304342 MB		
Maximum Write Data Rate: 3372.1 Mb/s (421.5 MB/s)		
Maximum Read Data Rate: 3372.7 Mb/s (421.6 MB/s)		
Minimum Write Data Rate: 2731.4 Mb/s (341.4 MB/s)		
Minimum Read Data Rate: 2733.3 Mb/s (341.7 MB/s)		
Average Write Data Rate: 3350.8 Mb/s (418.8 MB/s)		
Average Read Data Rate: 3362.1 Mb/s (420.3 MB/s)		
Average Data Rate: 3356.4 Mb/s (419.6 MB/s)		
Minimum Data Rate: 2731.4 Mb/s (341.4 MB/s)		



Max. Rate  
3372

Voltage 5.01V

Speed 5Gb/s

Duration 30 Minutes

Start

Stop

Configure

Flash LEDs

Clear Serial

Save Log

Reset All

Help

About

Exit

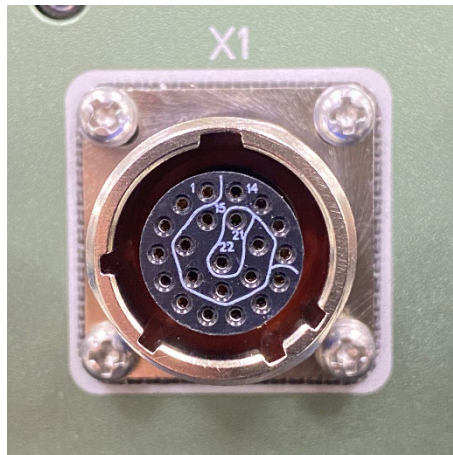
7STARLAKE

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# Outgoing Quality Inspection

## NV200-2LGS16

### 5-2. LAN 1\_(1Gbps)



```
[ 5] 79953.00-79954.00 sec 4.52 GBytes 38.8 Gbits/sec
[ 5] 79954.00-79955.00 sec 4.45 GBytes 38.2 Gbits/sec
[ 5] 79955.00-79956.00 sec 4.46 GBytes 38.3 Gbits/sec
[ 5] 79956.00-79957.00 sec 4.54 GBytes 39.0 Gbits/sec
[ 5] 79957.00-79958.00 sec 3.93 GBytes 33.8 Gbits/sec
[ 5] 79958.00-79959.00 sec 4.12 GBytes 35.4 Gbits/sec
[ 5] 79959.00-79960.00 sec 4.46 GBytes 38.4 Gbits/sec
[ 5] 79960.00-79961.00 sec 4.57 GBytes 39.3 Gbits/sec
[ 5] 79961.00-79962.00 sec 4.56 GBytes 39.1 Gbits/sec
[ 5] 79962.00-79963.00 sec 4.57 GBytes 39.2 Gbits/sec
[ 5] 79963.00-79964.00 sec 4.57 GBytes 39.2 Gbits/sec
[ 5] 79964.00-79965.00 sec 4.56 GBytes 39.1 Gbits/sec
[ 5] 79965.00-79966.00 sec 4.54 GBytes 39.0 Gbits/sec
[ 5] 79966.00-79967.00 sec 4.55 GBytes 39.1 Gbits/sec
[ 5] 79967.00-79968.00 sec 4.56 GBytes 39.2 Gbits/sec
[ 5] 79968.00-79969.00 sec 4.54 GBytes 39.0 Gbits/sec
[ 5] 79969.00-79970.00 sec 4.56 GBytes 39.2 Gbits/sec
[ 5] 79970.00-79971.00 sec 4.51 GBytes 38.7 Gbits/sec
[ 5] 79971.00-79972.00 sec 4.46 GBytes 38.3 Gbits/sec
[ 5] 79972.00-79973.00 sec 4.45 GBytes 38.2 Gbits/sec
[ 5] 79973.00-79974.00 sec 4.50 GBytes 38.7 Gbits/sec
[ 5] 79974.00-79975.00 sec 4.43 GBytes 38.0 Gbits/sec
[ 5] 79975.00-79976.00 sec 4.53 GBytes 38.9 Gbits/sec
[ 5] 79976.00-79977.00 sec 4.50 GBytes 38.7 Gbits/sec
[ 5] 79977.00-79978.00 sec 4.47 GBytes 38.4 Gbits/sec
[ 5] 79978.00-79979.00 sec 4.47 GBytes 38.4 Gbits/sec
[ 5] 79979.00-79980.00 sec 4.46 GBytes 38.3 Gbits/sec
[ 5] 79980.00-79981.00 sec 4.47 GBytes 38.4 Gbits/sec
[ 5] 79981.00-79982.00 sec 4.49 GBytes 38.5 Gbits/sec
[ 5] 79982.00-79983.00 sec 4.50 GBytes 38.6 Gbits/sec
[ 5] 79983.00-79984.00 sec 4.53 GBytes 38.9 Gbits/sec
[ 5] 79984.00-79985.00 sec 4.52 GBytes 38.9 Gbits/sec
[ 5] 79985.00-79986.00 sec 4.48 GBytes 38.5 Gbits/sec
[ 5] 79986.00-79987.00 sec 4.51 GBytes 38.7 Gbits/sec
[ 5] 79987.00-79988.00 sec 4.52 GBytes 38.8 Gbits/sec
[ 5] 79988.00-79989.00 sec 4.53 GBytes 38.9 Gbits/sec
[ 5] 79989.00-79990.00 sec 4.50 GBytes 38.7 Gbits/sec
[ 5] 79990.00-79991.00 sec 4.52 GBytes 38.9 Gbits/sec
[ 5] 79991.00-79992.00 sec 4.51 GBytes 38.7 Gbits/sec
[ 5] 79992.00-79993.00 sec 4.51 GBytes 38.7 Gbits/sec
[ 5] 79993.00-79994.00 sec 4.49 GBytes 38.6 Gbits/sec
[ 5] 79994.00-79995.00 sec 4.48 GBytes 38.5 Gbits/sec
[ 5] 79995.00-79996.00 sec 4.47 GBytes 38.4 Gbits/sec
[ 5] 79996.00-79997.00 sec 4.48 GBytes 38.5 Gbits/sec
[ 5] 79997.00-79998.00 sec 4.53 GBytes 39.0 Gbits/sec
[ 5] 79998.00-79999.00 sec 4.57 GBytes 39.3 Gbits/sec
[ 5] 79999.00-80000.00 sec 4.56 GBytes 39.2 Gbits/sec
[ 5] 80000.00-80000.05 sec 221 MBytes 39.3 Gbits/sec

-----
[ ID] Interval      Transfer      Bitrate
[ 5] 0.00-80000.05 sec 350 TBytes 38.5 Gbits/sec
-----
server listening on 5201
-----
```

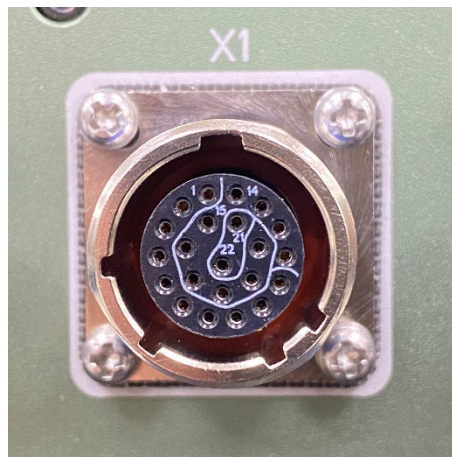
LAN Speed Test Result: Pass

LAN Data-Packet Test Result: 0 Lost (0% loss)

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### 5-3. LAN 2\_(1Gbps)



```
[ 5] 79952.00-79953.00 sec 4.50 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79953.00-79954.00 sec 4.52 GBytes 38.8 Cbits/sec 0 3.12 MBytes
[ 5] 79954.00-79955.00 sec 4.45 GBytes 38.2 Cbits/sec 0 3.12 MBytes
[ 5] 79955.00-79956.00 sec 4.46 GBytes 38.3 Cbits/sec 0 3.12 MBytes
[ 5] 79956.00-79957.00 sec 4.54 GBytes 39.0 Cbits/sec 0 3.12 MBytes
[ 5] 79957.00-79958.00 sec 3.90 GBytes 33.5 Cbits/sec 0 3.12 MBytes
[ 5] 79958.00-79959.00 sec 4.13 GBytes 35.5 Cbits/sec 0 3.12 MBytes
[ 5] 79959.00-79960.00 sec 4.49 GBytes 38.5 Cbits/sec 0 3.12 MBytes
[ 5] 79960.00-79961.00 sec 4.57 GBytes 39.3 Cbits/sec 0 3.12 MBytes
[ 5] 79961.00-79962.00 sec 4.56 GBytes 39.1 Cbits/sec 0 3.12 MBytes
[ 5] 79962.00-79963.00 sec 4.56 GBytes 39.2 Cbits/sec 0 3.12 MBytes
[ 5] 79963.00-79964.00 sec 4.57 GBytes 39.3 Cbits/sec 0 3.12 MBytes
[ 5] 79964.00-79965.00 sec 4.55 GBytes 39.1 Cbits/sec 0 3.12 MBytes
[ 5] 79965.00-79966.00 sec 4.54 GBytes 39.0 Cbits/sec 0 3.12 MBytes
[ 5] 79966.00-79967.00 sec 4.55 GBytes 39.1 Cbits/sec 0 3.12 MBytes
[ 5] 79967.00-79968.00 sec 4.56 GBytes 39.2 Cbits/sec 0 3.12 MBytes
[ 5] 79968.00-79969.00 sec 4.54 GBytes 39.0 Cbits/sec 0 3.12 MBytes
[ 5] 79969.00-79970.00 sec 4.56 GBytes 39.2 Cbits/sec 0 3.12 MBytes
[ 5] 79970.00-79971.00 sec 4.50 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79971.00-79972.00 sec 4.46 GBytes 38.3 Cbits/sec 0 3.12 MBytes
[ 5] 79972.00-79973.00 sec 4.45 GBytes 38.2 Cbits/sec 0 3.12 MBytes
[ 5] 79973.00-79974.00 sec 4.50 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79974.00-79975.00 sec 4.43 GBytes 38.1 Cbits/sec 0 3.12 MBytes
[ 5] 79975.00-79976.00 sec 4.53 GBytes 38.9 Cbits/sec 0 3.12 MBytes
[ 5] 79976.00-79977.00 sec 4.50 GBytes 38.6 Cbits/sec 0 3.12 MBytes
[ 5] 79977.00-79978.00 sec 4.48 GBytes 38.4 Cbits/sec 0 3.12 MBytes
[ 5] 79978.00-79979.00 sec 4.47 GBytes 38.4 Cbits/sec 0 3.12 MBytes
[ 5] 79979.00-79980.00 sec 4.46 GBytes 38.3 Cbits/sec 0 3.12 MBytes
[ 5] 79980.00-79981.00 sec 4.47 GBytes 38.4 Cbits/sec 0 3.12 MBytes
[ 5] 79981.00-79982.00 sec 4.49 GBytes 38.5 Cbits/sec 0 3.12 MBytes
[ 5] 79982.00-79983.00 sec 4.50 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79983.00-79984.00 sec 4.53 GBytes 38.9 Cbits/sec 0 3.12 MBytes
[ 5] 79984.00-79985.00 sec 4.52 GBytes 38.8 Cbits/sec 0 3.12 MBytes
[ 5] 79985.00-79986.00 sec 4.48 GBytes 38.5 Cbits/sec 0 3.12 MBytes
[ 5] 79986.00-79987.00 sec 4.51 GBytes 38.8 Cbits/sec 0 3.12 MBytes
[ 5] 79987.00-79988.00 sec 4.52 GBytes 38.8 Cbits/sec 0 3.12 MBytes
[ 5] 79988.00-79989.00 sec 4.53 GBytes 38.9 Cbits/sec 0 3.12 MBytes
[ 5] 79989.00-79990.00 sec 4.50 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79990.00-79991.00 sec 4.53 GBytes 38.9 Cbits/sec 0 3.12 MBytes
[ 5] 79991.00-79992.00 sec 4.50 GBytes 38.6 Cbits/sec 0 3.12 MBytes
[ 5] 79992.00-79993.00 sec 4.51 GBytes 38.7 Cbits/sec 0 3.12 MBytes
[ 5] 79993.00-79994.00 sec 4.49 GBytes 38.6 Cbits/sec 0 3.12 MBytes
[ 5] 79994.00-79995.00 sec 4.48 GBytes 38.5 Cbits/sec 0 3.12 MBytes
[ 5] 79995.00-79996.00 sec 4.48 GBytes 38.4 Cbits/sec 0 3.12 MBytes
[ 5] 79996.00-79997.00 sec 4.48 GBytes 38.5 Cbits/sec 0 3.12 MBytes
[ 5] 79997.00-79998.00 sec 4.54 GBytes 39.0 Cbits/sec 0 3.12 MBytes
[ 5] 79998.00-79999.00 sec 4.58 GBytes 39.3 Cbits/sec 0 3.12 MBytes
[ 5] 79999.00-80000.00 sec 4.56 GBytes 39.2 Cbits/sec 0 3.12 MBytes

[ ID] Interval      Transfer      Bitrate      Retr
[ 5] 0.00-80000.00 sec 350 TBytes 38.5 Gbits/sec 25
[ 5] 0.00-80000.05 sec 350 TBytes 38.5 Gbits/sec

iperf Done.
```

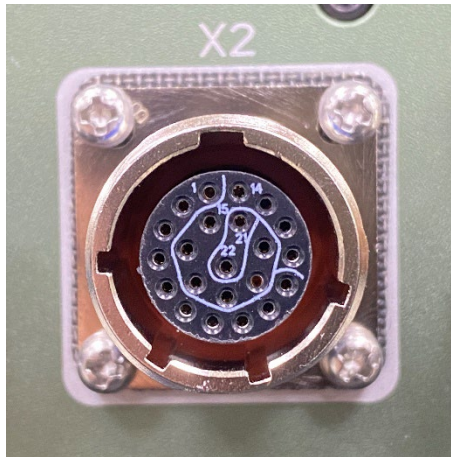
LAN Speed Test Result: Pass

LAN Data-Packet Test Result: 0 Lost (0% loss)

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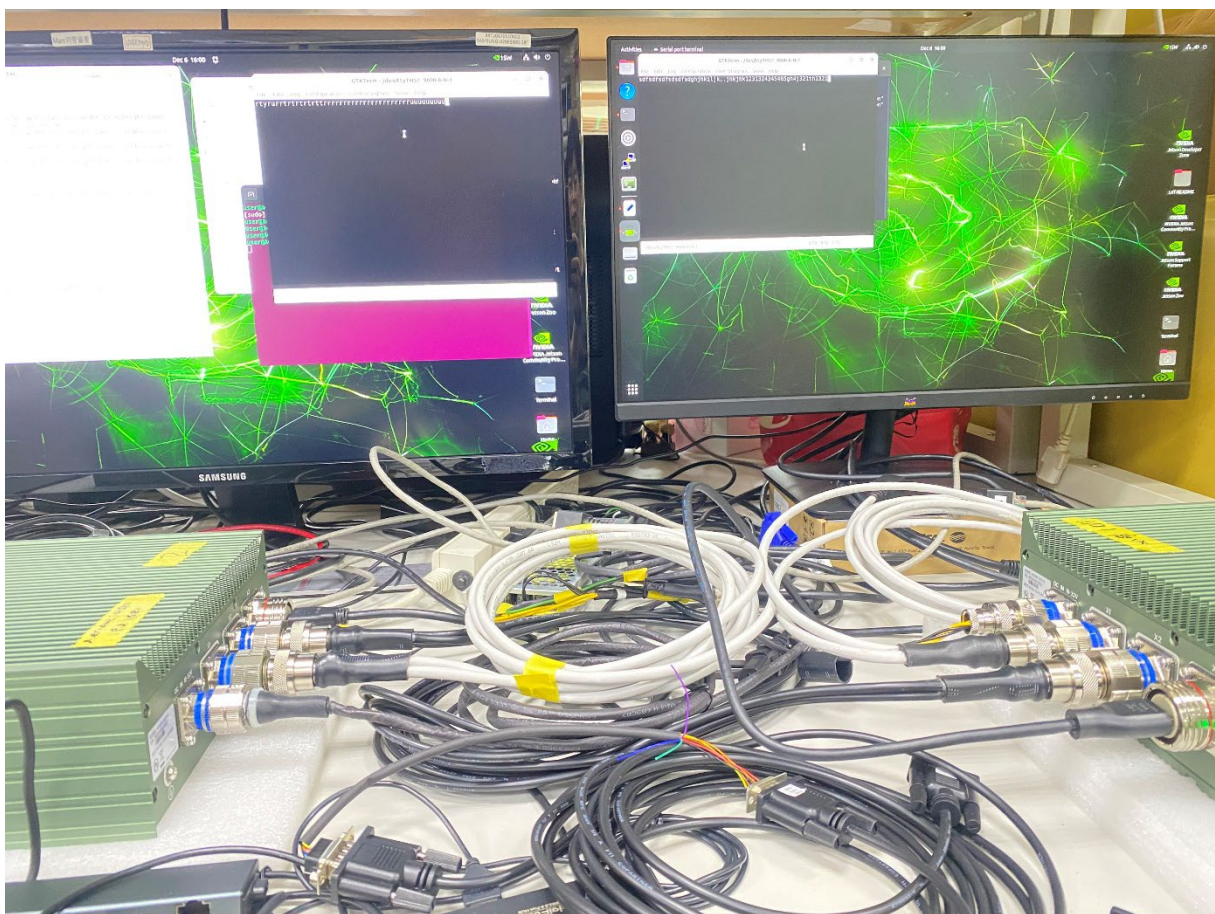
### 5-4. Serial Port (RS232)



Test RS232 Command (after wiring is completed)

```
sudo sh -c "echo 330 > /sys/class/gpio/export"  
sudo sh -c "echo 389 > /sys/class/gpio/export"  
sudo sh -c "echo low > /sys/class/gpio/PCC.02/direction"  
sudo sh -c "echo low > /sys/class/gpio/PG.06/direction"  
sudo gtkterm -p /dev/ttyTHS1 -s 9600
```

### 5-5. Serial Port (RS422/485)

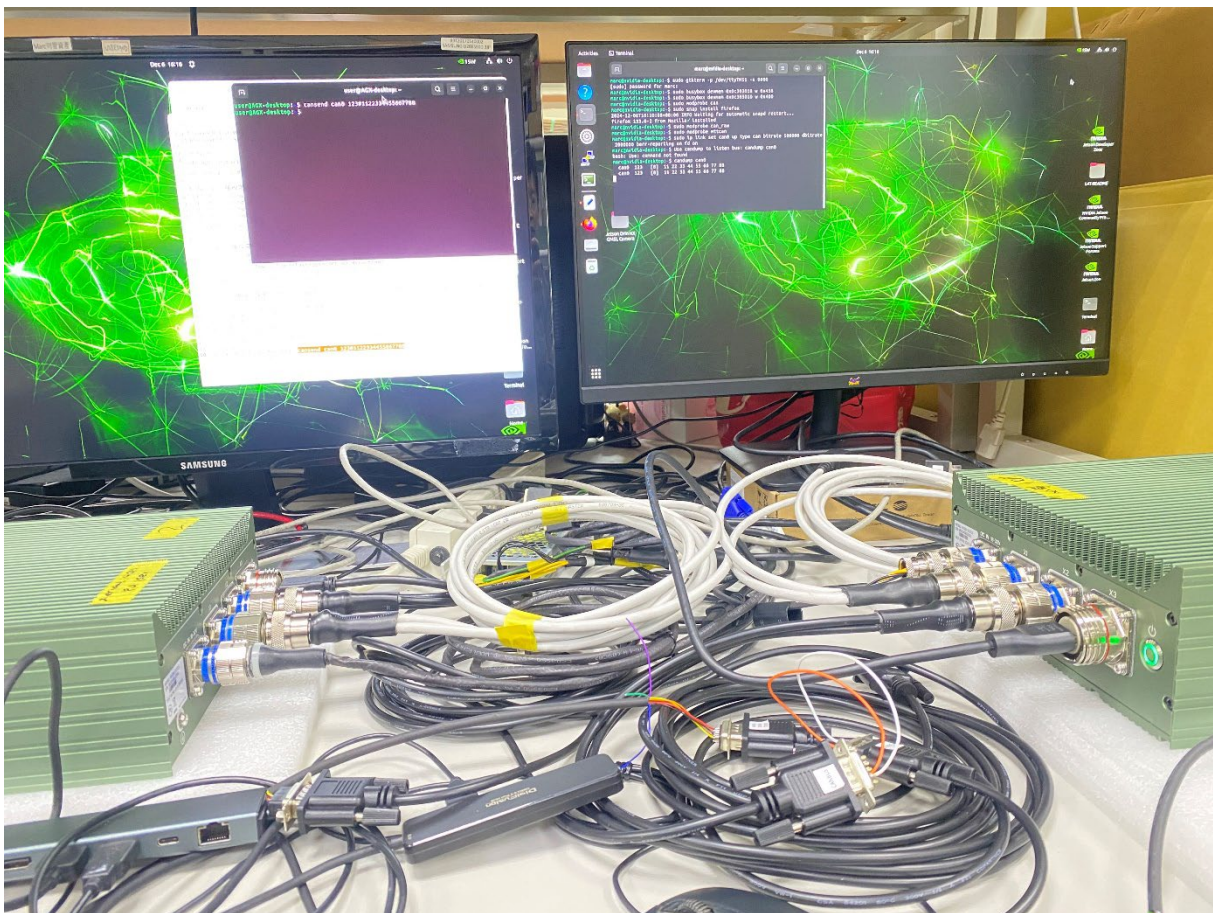
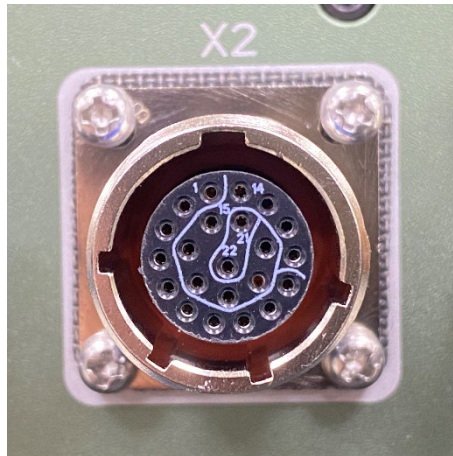


Test RS422/485 Command (after wiring is completed) , Rx to Tx, Tx to Rx but positive to positive, negative to negative

```
sudo sh -c "echo 330 > /sys/class/gpio/export"  
sudo sh -c "echo 389 > /sys/class/gpio/export"  
sudo sh -c "echo low > /sys/class/gpio/PCC.02/direction"  
sudo sh -c "echo high > /sys/class/gpio/PG.06/direction"  
sudo gtkterm -p /dev/ttyTHS1 -s 9600
```



### 5-6. CAN Bus Port



Test CAN Command (after wiring is completed)

```
sudo busybox devmem 0x0c303018 w 0x458
```

```
sudo busybox devmem 0x0c303010 w 0x400
```

```
sudo modprobe can
```

```
sudo modprobe can_raw
```

```
sudo modprobe mttcan
```

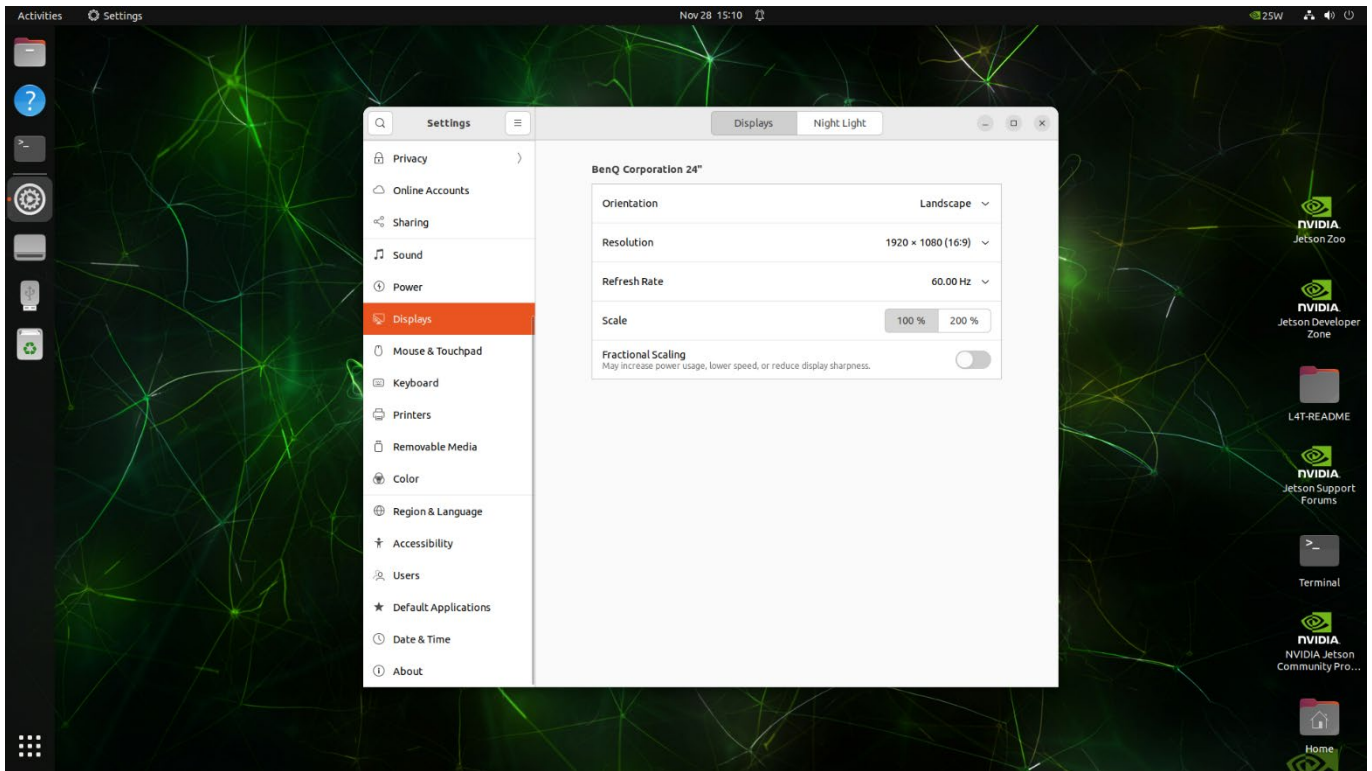
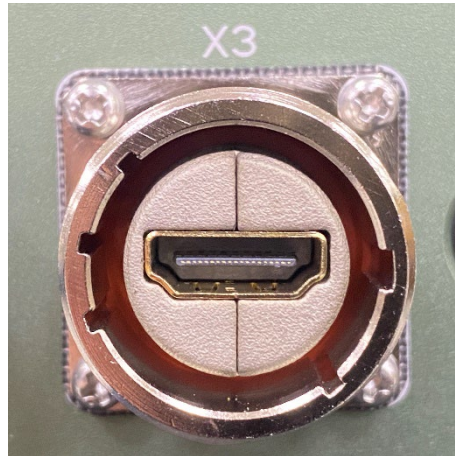
```
sudo ip link set can0 up type can bitrate 500000 dbitrate 2000000 berr-reporting on fd on
```

Use cangen to write random data: `cangen can0 -v`

Use cansend to write data: `cansend can0 123#1122334455667788`

Use candump to listen bus: `candump can0`

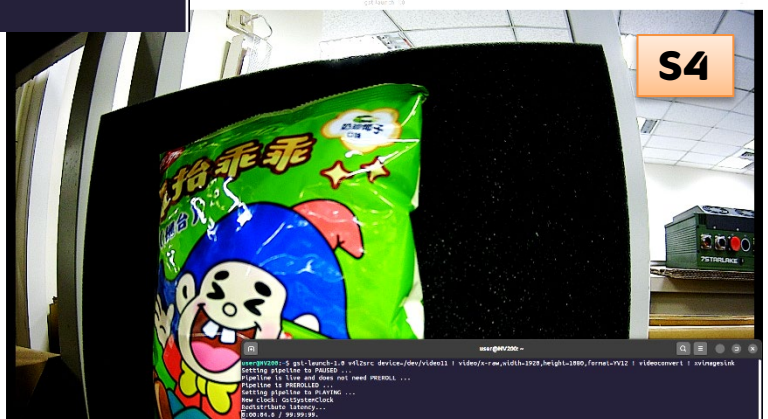
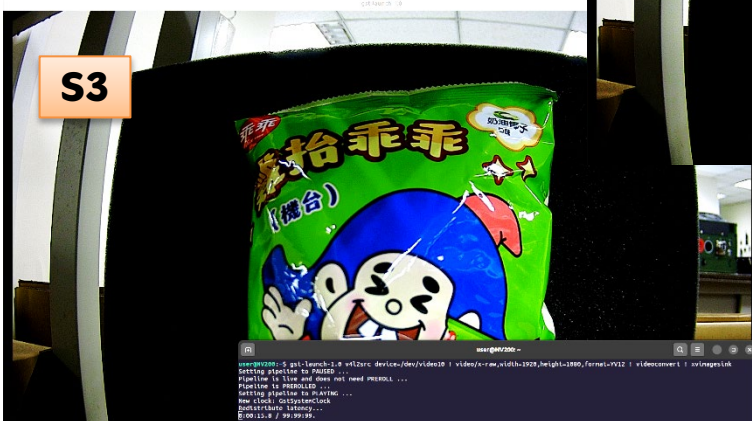
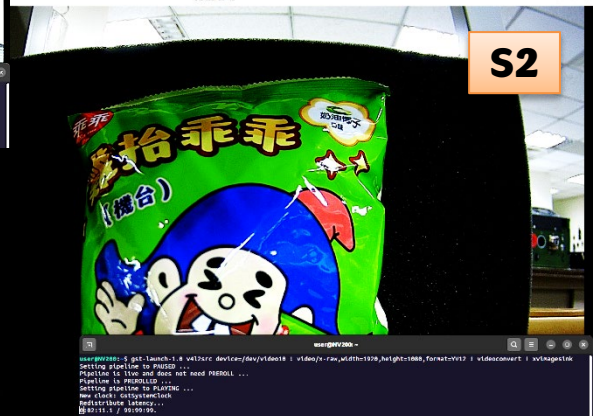
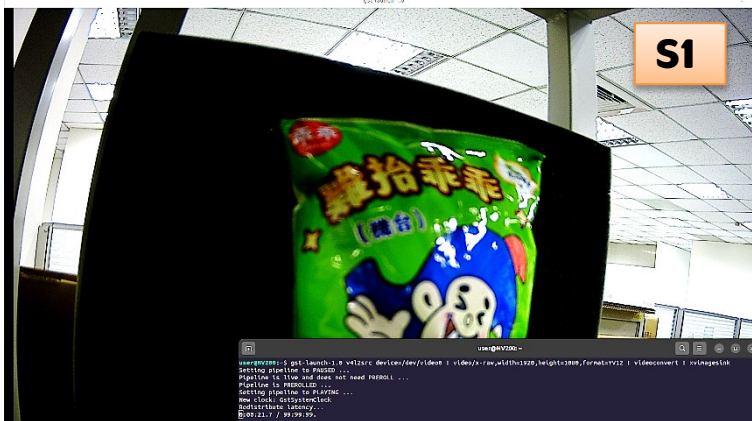
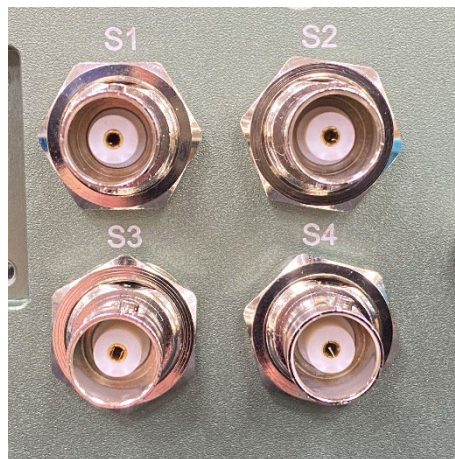
### 5-7. HDMI Port



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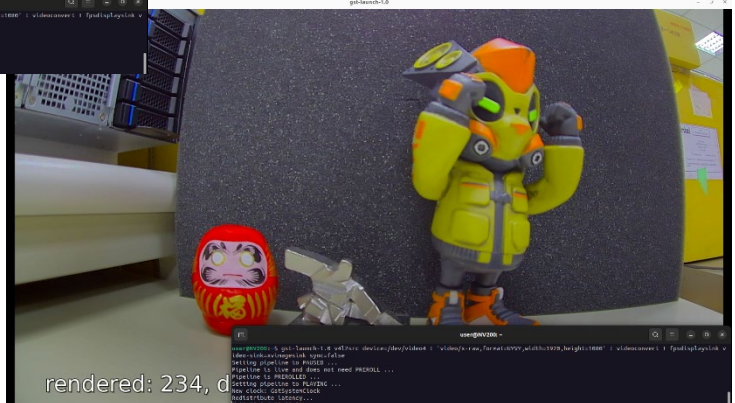
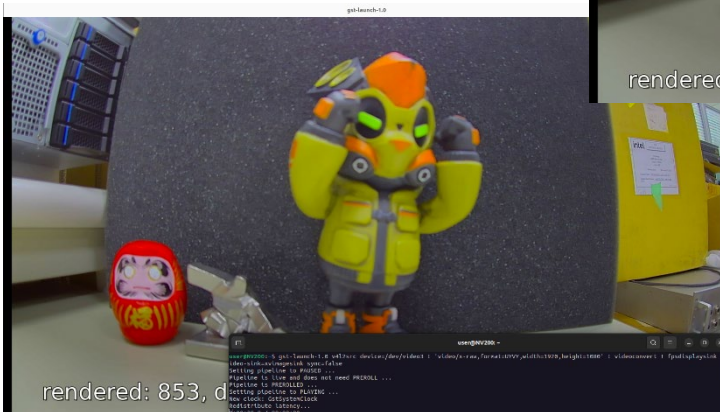
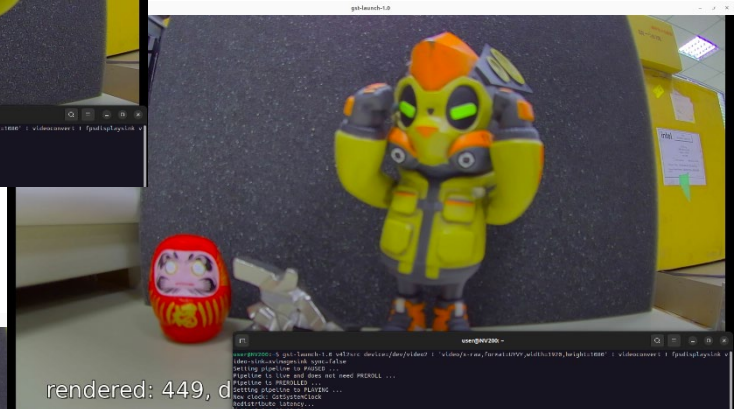
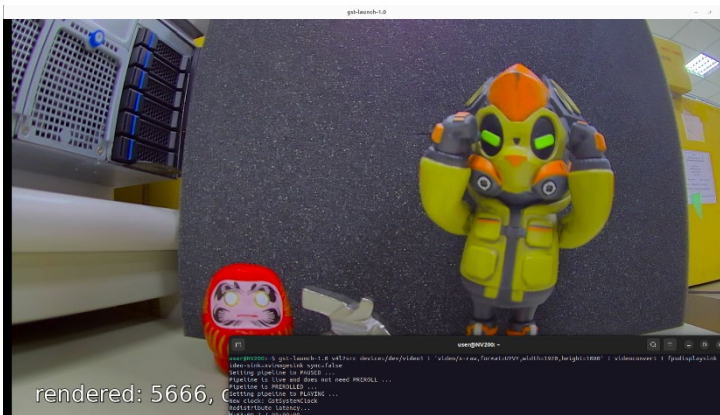
### 5-8. SDI Camera



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### 5-9. GMSL Camera



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