

# AIR-021 EVT Function Test Report

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### Revision History :

Date	Revision	Description	Creator
2025/11/07	1.0	EVT Function Test Report. (NX 8G/16G)	Neil9 Chen

## Table of Contents

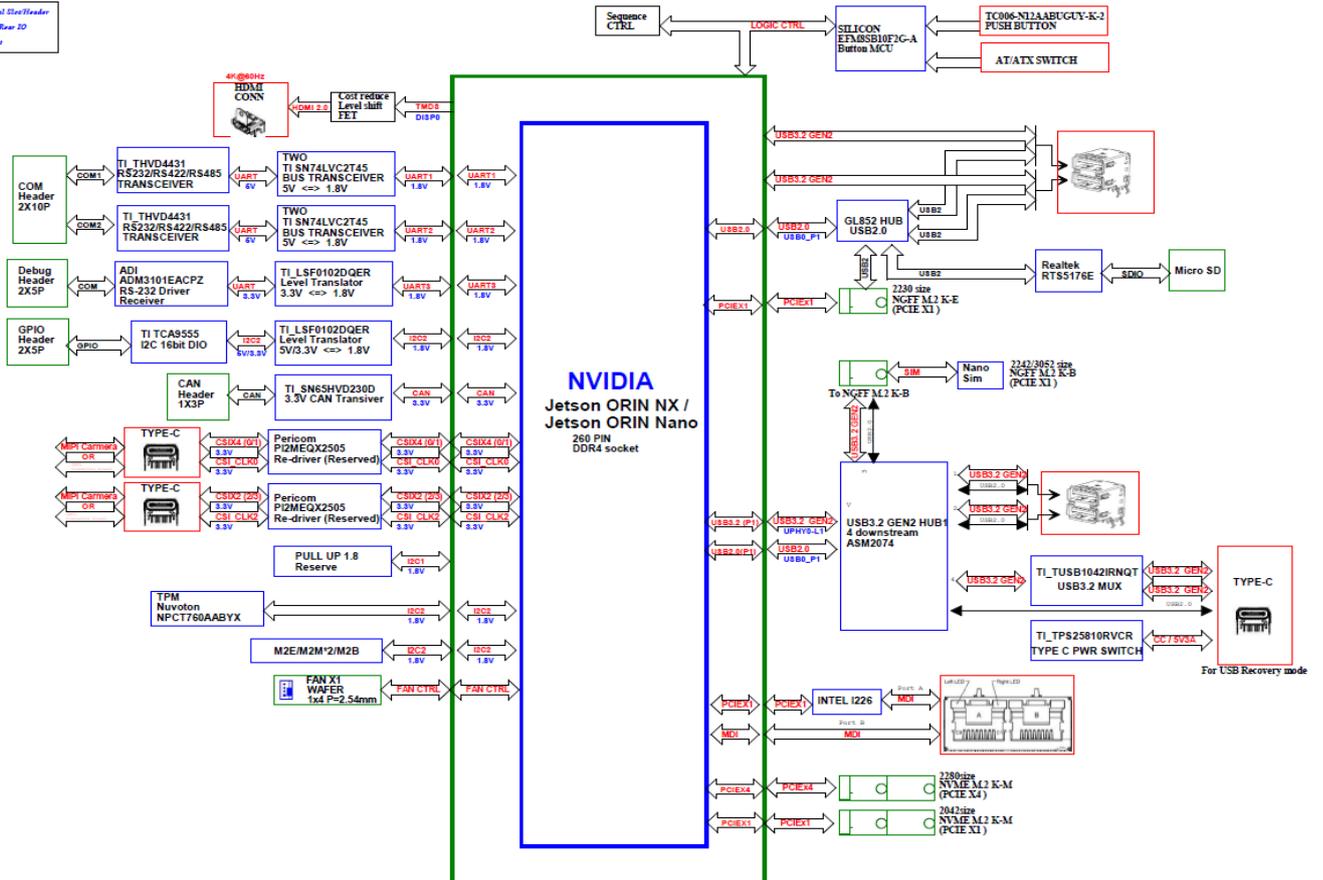
<b>Revision History :</b> .....	<b>2</b>
<b>Table of Contents</b> .....	<b>3</b>
<b>Chapter 1 : General</b> .....	<b>5</b>
1.01 Product Specification : .....	5
1.02 System Configuration : (Driver & firmware version).....	6
1.03 Testing Software and Equipment .....	7
1.04 Test Results Definition : .....	9
1.05 Test Results Summary : .....	10
<b>Chapter 2 : System Function test</b> .....	<b>12</b>
2.01 CPU.....	12
2.02 Memory.....	13
2.03 Boot Sequence Test .....	14
2.04 Storage Device .....	15
2.04.1 MicroSD Card .....	15
2.04.2 M.2 NVME Storage .....	17
2.05 USB.....	19
2.05.1 USB mass storage .....	19
2.05.2 USB TypeC Recovery Mode.....	21
2.06 Display .....	22
2.06.1 HDMI.....	22
2.07 Ethernet .....	23
2.07.1 LAN Basic Function test.....	23
2.07.2 LAN speed and LED check .....	24
2.08 COM Port Test .....	26
2.08.1 Debug Console.....	26
2.08.2 RS-232 .....	27
2.08.3 RS-422/RS-485 .....	29
2.09 M.2 Function.....	31
2.10 GPIO Test.....	33
2.11 CAN-Bus Test .....	35
2.12 RTC .....	37
2.13 Button.....	38

2.14	Camera .....	39
2.14.1	MIPI CSI Over TypeC Camera .....	39
2.14.2	GMSL TypeC Camera.....	40
2.15	TPM Function .....	41
2.16	SIM Holder Function .....	42
<b>Chapter 3 : Performance Test .....</b>		<b>43</b>
3.01	MicroSD Performance .....	43
3.02	M.2 Performance.....	44
3.03	Ethernet Performance.....	45
<b>Chapter 4 : Compatibility Test.....</b>		<b>47</b>
4.01	MicroSD Compatibility.....	47
4.02	USB Compatibility.....	48
4.03	Monitor Compatibility .....	49
<b>DI-A00210.....</b>		<b>49</b>
<b>Chapter 5 : Reliability Test .....</b>		<b>50</b>
5.01	System On/Off Test.....	50
5.01.1	Power cycle test .....	50
5.01.2	Reboot Stress Test .....	51
5.02	CPU Stress Test.....	52
5.03	Memory Stress Test.....	53
5.04	Graphic Stress Test.....	54
5.05	COM Port Stress Test.....	55
5.06	LAN Stress Test .....	56
5.07	System Stress Test.....	58

# Chapter 1 : General

## 1.01 Product Specification :

### Block Diagram AIR-021



## 1.02 System Configuration : (Driver & firmware version)

Item.	Description.	Item.	Description.
<b>Project Name.</b>	AIR-021	<b>PCB Version.</b>	A101-1
<b>M/B No</b>	DUT-1: ESE0422164 DUT-2: ESE0422180	<b>Kernel Version.</b>	Linux localhost.localdomain 5.15.148-tegra #1 SMP PREEMPT Wed Sep 10 14:00:47 CST 2025 aarch64 aarch64 aarch64 GNU/Linux
<b>Image Version.</b>	AIR-021_0910_CBB.tar.gz Bug verify: AIR-021_1016_GMSL.tar.gz	<b>OS Version.</b>	Ubuntu 22.04.5 LTS
<b>CPU Model/Info</b>	Nvidia Orin NX 16G/8G		
<b>Memory Type/Info</b>	On-board DDR4	<b>Total Memory Size</b>	8GB/16GB
<b>WLAN Device</b>	AIW-170BQ-001	<b>4G/5G Device</b>	AIW-356DQ-E01
<b>Output Display Type</b>	HDMI	<b>AC/DC Adaptor Model</b>	FSP Group INC. FSP120-AAAN3

## 1.03 Testing Software and Equipment

Testing software :

Test Program	Version / Description
memtester	Memory test
dd	Storage Read/Write test
echo	Serial Port test
iperf3	WLAN test, LAN test
hwclock, date	RTC test
boottimes	Reboot test
Burnin	Power consumption test/CPU burn-in test

## Test Equipment :

Model	Description
Power on/off test equipment (ATX/AT)	
WLAN Access Point (Model. TPLink Archer BE550 BE9300 Tri-Band Wi-Fi 7 Router)	
SIM Card A SIM card or Subscriber Identity Module is a portable memory chip used in some models of cellular telephones. The SIM card makes it easy to switch to a new phone by simply sliding the SIM out of the old phone and into the new one. The SIM holds personal identity information, cell phone number, phone book, text messages and other data. It can be thought of as a mini hard disk that automatically activates the phone into which it is inserted.	
COM RS-232 Loopback Plug	
CAN Bus Test Fixture. (Model. USBCAN-2E-U)	
TECPEL Digital Multi Meter (Model. DMM 8050) <ul style="list-style-type: none"> <li>● DMM-8050:</li> <li>● True RMS.</li> <li>● 19.999 count LCD display.</li> <li>● 0.05% DC V accuracy.</li> <li>● High voltage to 1,000 DC and 750V AC.</li> <li>● 20A DC/AC current range and 20MΩ.</li> <li>● Frequency measurement.</li> <li>● Data hold.</li> <li>● Logic test.</li> <li>● Duty cycle measurement.</li> <li>● Drop-proof to 10ft.</li> <li>● Overload protection.</li> </ul> Meet IEC-348 and UL-1244 standard	

## 1.04 Test Results Definition :

Criteria	Definition
<b>PASS</b>	Test result pass and function work perfectly.
<b>Fail</b>	Test fail or cannot meet the spec requirement.
<b>Limitation</b>	There are no plans to fix this erratum.
<b>Skip</b>	Test cannot execute due to no test program, driver or test device.
<b>N/A</b>	Spec not support or driver not ready.
<b>Note</b>	Reference Data

## 1.05 Test Results Summary :

Num.	Test Item	Result	Remark
<b>Chapter.2</b>	<b>System Function Test</b>		
2.01	CPU	<b>PASS</b>	
2.02	Memory	<b>PASS</b>	
2.03	Boot Sequence Test	<b>PASS</b>	
2.04	Storage Device	<b>PASS</b>	
2.05	USB	<b>PASS</b>	
2.06	Display	<b>PASS</b>	
2.07	Ethernet	<b>PASS</b>	
2.08	COM Port Test	<b>PASS</b>	
2.09	M.2 Function	<b>PASS</b>	
2.10	GPIO	<b>PASS</b>	
2.11	CAN-Bus Test	<b>PASS</b>	
2.12	RTC	<b>PASS</b>	
2.13	Button	<b>PASS</b>	
2.14	Camera	<b>PASS</b>	
2.15	TPM Function	<b>PASS</b>	
2.16	SIM Holder Function	<b>PASS</b>	
<b>Chapter.3</b>	<b>Performance Test</b>		
3.01	MicroSD Performance	<b>PASS</b>	
3.02	M.2 Performance	<b>PASS</b>	
3.03	Ethernet Performance	<b>PASS</b>	
<b>Chapter.4</b>	<b>System Compatibility Test</b>		
4.01	MicroSD Compatibility	<b>PASS</b>	
4.02	USB Compatibility	<b>PASS</b>	
4.03	Monitor Compatibility	<b>PASS</b>	
<b>Chapter.5</b>	<b>Reliability Test</b>		
5.01	System On/Off Test	<b>PASS</b>	
5.02	CPU Stress Test	<b>PASS</b>	
5.03	Memory Stress Test	<b>PASS</b>	
5.04	Graphic Stress Test	<b>PASS</b>	

5.05	COM Port Stress Test	<b>PASS</b>	
5.06	LAN Stress Test	<b>PASS</b>	
5.07	System Stress Test	<b>PASS</b>	

## Chapter 2 : System Function test

### 2.01 CPU

#### 2.01.1.01 Test Purpose:

The test ensures that the function of the CPU tallies with the CPU specification.

#### 2.01.1.02 Test Tool or Equipment:

1. N/A

#### 2.01.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.01.1.04 Test Procedure:

1. Boot into OS, check the processor info under OS.  
# cat /proc/cpuinfo
2. Check CPU frequency.  
# cat /sys/devices/system/cpu/cpu0/cpufreq/cpuinfo\_max\_freq  
# cat /sys/devices/system/cpu/cpu0/cpufreq/cpuinfo\_cur\_freq

#### 2.01.1.05 Test Result:

Item	Criteria	Result	Notes
OS CPU info	Check the CPU information is correct.	<b>PASS</b>	
CPU frequency	Check the CPU information is correct. CPU Current Frequency will dynamically change by system loading and temperature.	<b>PASS</b>	

## 2.02 Memory

### 2.02.1.01 Test Purpose :

The test ensures that the function of the Memory tallies with the Memory specification.

### 2.02.1.02 Test Tool or Equipment:

1. N/A

### 2.02.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.02.1.04 Test Procedure:

1. Boot into OS, check memory info.  
# cat /proc/meminfo

### 2.02.1.05 Test Result:

Item	Criteria	Result	Notes
OS memory info	Memory Capacity information is correct.	<b>PASS</b>	

## 2.03 Boot Sequence Test

### 2.03.1.01 Test Purpose :

Evaluate whether the Boot Switch is workable and maintained in a stable condition.

### 2.03.1.02 Test Tool or Equipment:

1. M.2 NVME Storage Device

### 2.03.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.03.1.04 Test Procedure:

1. Check the device boot up from M.2.

### 2.03.1.05 Test Result:

Item	Criteria	Result	Notes
M.2 Boot	System can boot up normal from M.2.	<b>PASS</b>	

## 2.04 Storage Device

### 2.04.1 MicroSD Card

#### 2.04.1.01 Test Purpose :

Evaluate whether the MicroSD is workable and maintained in a stable condition when working at reading and writing.

#### 2.04.1.02 Test Tool or Equipment:

1. MicroSD Card

#### 2.04.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.04.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Insert MicroSD card to the SD Card slot on the DUT.
3. Check the space of MicroSD card.  
# fdisk -l /dev/sda
4. Mount MicroSD card.  
# mkdir /mnt/sdcard  
# mount /dev/sda /mnt/sdcard
5. Run command to read/write 1G file on MicroSD card.  
# dd if=/dev/zero of=/mnt/sdcard/testFile bs=1M count=1000  
# dd if=/mnt/sdcard/testFile of=/dev/zero bs=1M
6. Un-mount MicroSD card. Re-insert MicroSD card 5 times, mount again and check read/write function.  
# umount /mnt/sdcard  
# mount /dev/sda /mnt/sdcard
7. Check MicroSD card read/write function after reboot / wakeup.  
(MicroSD card could be located at /dev/sda , /dev/sda1, check with RD first)

**2.04.1.05 Test Result:**

Item	Criteria	Result	Notes
MicroSD Card	The capacity of MicroSD card is correct.	<b>PASS</b>	
	Read/Write test 1G file to check the MicroSD card function can work properly.	<b>PASS</b>	
	MicroSD card can read/write after re-insert.	<b>PASS</b>	
	MicroSD card can read/write after reboot.	<b>PASS</b>	
	MicroSD card can read/write after wakeup.	<b>PASS</b>	

## 2.04.2 M.2 NVME Storage

### 2.04.2.01 Test Purpose :

The purpose of this test is to examine the functional of the M.2 NVME storage.

### 2.04.2.02 Test Tool or Equipment:

1. M.2 M Key 2280 NVME SSD (Advantech SQF-C8MV2-256GDEFM)
2. M.2 M Key 2242 NVME SSD (Advantech SQF-C4MV4-2TDEDM, QE.NO: EX-A01148)

### 2.04.2.03 Testing Configuration:

1. Test environment: Room temperature

### 2.04.2.04 Test Procedure:

1. Insert M.2 NVME storage device to the M.2 slot on the DUT.
2. Power on the device and boots into OS.
3. Check the space of attached M.2 NVME storage device.  
# fdisk -l
4. Run command to read/write 1G file on M.2 NVME storage device. Record the read/write speed in Notes below.  
# mkdir /mnt/M2  
# mount /dev/nvme0n1p2 /mnt/M2  
# dd if=/dev/zero of=/mnt/M2/testFile bs=1M count=1000  
# dd if=/mnt/M2/testFile of=/dev/zero bs=1M
5. Check M.2 NVME storage device read/write function after reboot / wakeup.  
(M.2 could be located at /dev/ nvme0n1p1 , /dev/ nvme0n1p2, check with RD first)

### 2.04.2.05 Test Result:

#### M.2 2280

Item	Criteria	Result	Notes
M.2 NVME storage	The capacity of M.2 NVME device is correct.	PASS	
	No error to read/write the M.2 NVME device.	PASS	
	Function after reboot.	PASS	
	Function after wakeup.	PASS	

## M.2 2242

Item	Criteria	Result	Notes
M.2 NVME storage	The capacity of M.2 NVME device is correct.	PASS	
	No error to read/write the M.2 NVME device.	PASS	
	Function after reboot.	PASS	
	Function after wakeup.	PASS	

## 2.05 USB

### 2.05.1 USB mass storage

#### 2.05.1.01 Test Purpose :

The purpose of this test is to ensure the functional of the USB port.

#### 2.05.1.02 Test Tool or Equipment:

1. USB Flash Device

#### 2.05.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.05.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Plug in a USB flash device into USB connector and check system can detect it.
3. Run command to read/write 1G file on USB flash. Record the read/write speed in Notes below.
 

```
# mkdir /mnt/usb
# mount /dev/sda1 /mnt/usb
# dd if=/dev/zero of=/mnt/usb/testFile bs=1M count=1000
# dd if=/mnt/usb/testFile of=/dev/zero bs=1M
```
4. Un-mount USB disk. Re-insert USB flash 5 times. Mount USB again and check read/write function.
 

```
# umount /mnt/usb
# mount /dev/sda1 /mnt/usb
```
6. Check USB read/write function after reboot / wakeup.  
(USB could be located at /dev/sda0 , /dev/sda1, check with RD first)  
(If dd command does not show read/write speed, use “time dd …” to measure the time.)

#### 2.05.1.05 Test Result:

Item	Criteria	Result	Notes
USB1	System should detect the USB flash device.	PASS	
	Read/Write test 1G of data file to check the USB function can work properly.	PASS	

	USB can read/write after re-insert 5 times.	PASS	
	USB can read/write after reboot.	PASS	
	USB can read/write after wakeup.	PASS	
USB2	System should detect the USB flash device.	PASS	
	Read/Write test 1G of data file to check the USB function can work properly.	PASS	
	USB can read/write after re-insert 5 times.	PASS	
	USB can read/write after reboot.	PASS	
	USB can read/write after wakeup.	PASS	
USB3	System should detect the USB flash device.	PASS	
	Read/Write test 1G of data file to check the USB function can work properly.	PASS	
	USB can read/write after re-insert 5 times.	PASS	
	USB can read/write after reboot.	PASS	
	USB can read/write after wakeup.	PASS	
USB4	System should detect the USB flash device.	PASS	
	Read/Write test 1G of data file to check the USB function can work properly.	PASS	
	USB can read/write after re-insert 5 times.	PASS	
	USB can read/write after reboot.	PASS	
	USB can read/write after wakeup.	PASS	

## 2.05.2 USB TypeC Recovery Mode

### 2.05.2.01 Test Purpose :

The purpose of this test is to validate and ensure the functional of the USB TypeC Port.

### 2.05.2.02 Test Tool or Equipment:

1. USB TypeC Cable
2. Linux Host PC

### 2.05.2.03 Testing Configuration:

1. Test environment: Room temperature

### 2.05.2.04 Test Procedure:

1. Use a USB Type-C cable to connect the DUT and the Linux Host PC.
2. Set JRCoVY1 to ON and press the power button.
3. On the Host PC, make sure the DUT is detected.
4. On the Host PC, run the command to flash the image.

### 2.05.2.05 Test Result:

Item	Method	Criteria	Result	Notes
USB TypeC port	Update image from USB TypeC port function check.	There is no error by test.	<b>PASS</b>	

## 2.06 Display

### 2.06.1 HDMI

#### 2.06.1.01 Test Purpose :

The purpose of this test is to examine the function of the HDMI Interface.

#### 2.06.1.02 Test Tool or Equipment:

1. HDMI Monitor
2. Video (File Information: Name: 1080p.mkv | Signed 16-bit Little Endian | 48 kHz | Stereo)

#### 2.06.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.06.1.04 Test Procedure:

1. Use the HDMI cable to connect the HDMI Monitor.
2. Boot into OS and use build-in GUI to change resolution.
3. Play a video to check the HDMI audio output.

#### 2.06.1.05 Test Result:

	Item	Criteria	Result	Notes
HDMI	1080P60 1920x1080 ,60 Hz	1. There is no shivering. 2. There is no water ripple	PASS	
	4K60 3840x2160 ,60 Hz	3. There is no color error 4. There is no flicker	PASS	
	HDMI-Audio Function	Check if the voice is from HDMI device.	PASS	
	Cable Hot-Plug checks under OS for 5 times.		PASS	
	Function after reboot.		PASS	
	Function after wakeup.		PASS	

## 2.07 Ethernet

### 2.07.1 LAN Basic Function test

#### 2.07.1.01 Test Purpose :

The purpose of this test is to examine the LAN basic function and to ensure the functional of ethernet controllers.

#### 2.07.1.02 Test Tool or Equipment:

1. Cable length: Cat.5E (100m)

#### 2.07.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.07.1.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Connect Client (DUT) to internet with dhcp.
3. Connecting internet to surfing websites under Ubuntu OS.
4. LAN speed detect function test (1G).  
# iperf3 -c IP -t 100 r
5. Connect the 100-meter LAN cable and ping 192.168.11.1 500 times.  
# ping 192.168.11.1 -c 500

#### 2.07.1.05 Test Result:

Item	Method	Criteria	Result	Notes
LAN1	Connecting internet to surfing websites under Ubuntu OS.	There is no error by test	PASS	
LAN2			PASS	
LAN1	LAN speed detect function test (1G). (command: iperf3 -c IP -t 100 r)	There is no error by test	PASS	
LAN2			PASS	
LAN1	Connect 100-meter LAN cable and ping 192.168.11.1 500 times. (command: ping 192.168.11.1 -c 500)	There is no error by test	PASS	
LAN2			PASS	

## 2.07.2 LAN speed and LED check

### 2.07.2.01 Test Purpose :

The purpose of this test is to ensure the functional of the LAN LED.

### 2.07.2.02 Test Tool or Equipment:

1. Cable length: Cat.5E (3m)

### 2.07.2.03 Testing Configuration:

1. Test environment: Room temperature

### 2.07.2.04 Test Procedure:

1. Connect LAN cable from LAN port of DUT to network.
2. Turn on DUT, boot into OS.
3. Using follow command to test LED status.

For LAN1:

```
# ethtool -s enP8p1s0 speed 10 duplex half autoneg on //10m
# ethtool -s enP8p1s0 speed 10 duplex full autoneg on //10m
# ethtool -s enP8p1s0 speed 100 duplex half autoneg on //100m
# ethtool -s enP8p1s0 speed 100 duplex full autoneg on //100m
# ethtool -s enP8p1s0 speed 1000 duplex full autoneg on //1000m
```

For LAN2:

```
# ethtool -s enP9p1s0 speed 10 duplex half autoneg on //10m
# ethtool -s enP9p1s0 speed 10 duplex full autoneg on //10m
# ethtool -s enP9p1s0 speed 100 duplex half autoneg on //100m
# ethtool -s enP9p1s0 speed 100 duplex full autoneg on //100m
# ethtool -s enP9p1s0 speed 1000 duplex full autoneg on //1000m
# ethtool -s enP9p1s0 speed 2500 duplex full autoneg on //2500m
```

**2.07.2.05 Test Result:**

Board LED			Criteria		Result		Notes
			Color	Status	Color	Status	
LAN1	Left	Speed LED-10 Mbps	Off	Off	<b>PASS</b>	<b>PASS</b>	
		Speed LED-100 Mbps	Off	Off	<b>PASS</b>	<b>PASS</b>	
		Speed LED-1 Gbps	Green	On	<b>PASS</b>	<b>PASS</b>	
	Right	Activity LED	Green	Blink	<b>PASS</b>	<b>PASS</b>	
		Link LED	Green	On	<b>PASS</b>	<b>PASS</b>	
LAN2	Left	Speed LED-10 Mbps	Off	Off	<b>PASS</b>	<b>PASS</b>	
		Speed LED-100 Mbps	Off	Off	<b>PASS</b>	<b>PASS</b>	
		Speed LED-1 Gbps	Orange	On	<b>PASS</b>	<b>PASS</b>	
		Speed LED-2.5 Gbps	Green	On	<b>PASS</b>	<b>PASS</b>	
	Right	Activity LED	Green	Blink	<b>PASS</b>	<b>PASS</b>	
		Link LED	Green	On	<b>PASS</b>	<b>PASS</b>	

## 2.08 COM Port Test

### 2.08.1 Debug Console

#### 2.08.1.01 Test Purpose :

The purpose of this test is to examine the Console Port basic function.

#### 2.08.1.02 Test Tool or Equipment:

1. USB to serial RS-232 cable
2. RS-232 cable

#### 2.08.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.08.1.04 Test Procedure:

1. Connect the debug console to PC.
2. Set terminal program as 115200bps,8,n,1 on the PC.
3. Turn on the DUT power and boot to OS.
4. Check the PC terminal shows DUT power log. User can input command and get response from debug console port.

#### 2.08.1.05 Test Result:

Item	Criteria	Result	Notes
Debug Port Test	1. The window of terminal program should display	<b>PASS</b>	
Function after reboot	EUT POST.	<b>PASS</b>	
Function After wake up	1. It can work properly as former status after wake up.	<b>PASS</b>	

## 2.08.2 RS-232

### 2.08.2.01 Test Purpose :

The purpose of this test is to examine the Serial Port basic function.

### 2.08.2.02 Test Tool or Equipment:

1. USB to serial RS-232 cable
2. RS-232 loopback testing fixture
3. Cable length (15m)
4. Putty

### 2.08.2.03 Testing Configuration:

1. Test environment: Room temperature

### 2.08.2.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Connect RS-232 loopback testing fixture to COM port.
3. Run command to test loopback function.  

```
# stty -F /dev/ttyTHS1 speed 115200 raw -echo  
# cat /dev/ttyTHS1 &  
# echo "1234" > /dev/ttyTHS1
```
4. Connect RS-232 loopback testing fixture to COM port with the 15m cable.
5. Run command to test loopback function.  

```
# stty -F /dev/ttyTHS1 speed 115200 raw -echo  
# cat /dev/ttyTHS1 &  
# echo "1234" > /dev/ttyTHS1
```
6. Connect the RS-232 port to PC. Set configuration of UART as Full Tx/Rx, 9600bps, 8n1 and run command to test COM port. Repeat for baud rate 19200, 38400, 57600, and 115200.  

```
# stty -F /dev/ttyTHS1 speed 9600 raw -echo  
# cat /dev/ttyTHS1 &  
# echo "1234" > /dev/ttyTHS1
```
7. Run command to test flow control function.
8. Test function after reboot/wake up.

## 2.08.2.05 Test Result:

Port.	Item	Baud Rate	Criteria	Result	Notes
COM1	Loopback Test	115200bps	Lookback test shouldn't have any error.	PASS	
	Send&Receive Test	9600bps	There isn't any error during transmitting data between EUT-A and PC for 5 mins.	PASS	
		19200bps		PASS	
		38400bps		PASS	
		57600bps		PASS	
		115200bps		PASS	
	Cable length (15 meter)		It can work properly without any problem.	PASS	
	Flow Control	Hardware	The com port flow control can work normally when com port has data transmission.	PASS	
		Software		PASS	
	Function after reboot	115200bps	The COM port can work normally after reboot.	PASS	
Function After wake up	It can work properly as former status after wake up.		PASS		
COM2	Loopback Test	115200bps	Lookback test shouldn't have any error.	PASS	
	Send&Receive Test	9600bps	There isn't any error during transmitting data between EUT-A and PC for 5 mins.	PASS	
		19200bps		PASS	
		38400bps		PASS	
		57600bps		PASS	
		115200bps		PASS	
	Cable length (15 meter)		It can work properly without any problem.	PASS	
	Flow Control	Hardware	The com port flow control can work normally when com port has data transmission.	PASS	
		Software		PASS	
	Function after reboot	115200bps	The COM port can work normally after reboot.	PASS	
Function After wake up	It can work properly as former status after wake up.		PASS		

## 2.08.3 RS-422/RS-485

### 2.08.3.01 Test Purpose :

The purpose of this test is to examine the Serial Port basic function.

### 2.08.3.02 Test Tool or Equipment:

1. USB to serial RS-232 cable
2. RS-422 loopback testing fixture
3. Advantech ADAM-4520 testing fixture
4. Putty

### 2.08.3.03 Testing Configuration:

1. Test environment: Room temperature

### 2.08.3.04 Test Procedure:

1. Switch the COM port to RS-422 (by switch or GPIO). Power on the device and boot to OS.
2. Connect RS-422 port to ADAM-4520, and ADAM-4520 to PC through RS-232.
3. Run minicom on DUT and terminal program on PC. Transfer text bidirectional.
4. Switch the COM port to RS-485 (by switch or GPIO). Power on the device and boot to OS.
5. Connect RS-485 port to ADAM-4520, and ADAM-4520 to PC through RS-232.
6. Run minicom on DUT and terminal program on PC. Transfer text bidirectional.

### 2.08.3.05 Test Result:

RS-422

Item		Criteria	Result	Notes
COM1	Loopback	115200 1. The data can be sent and receive when connect loopback test.	PASS	
	Data Transfer	Send	1. There is no error during when DUT and other PC transmit data.	PASS
		Receive		PASS
	Band rate	9600	1. There is no error during the process at different band rate.	PASS
		38400		PASS
		115200		PASS
	Function after Reboot		1. It can work properly as	PASS

			former status.		
COM2	Loopback	115200	1. The data can be sent and receive when connect loopback test.	PASS	
	Data Transfer	Send	1. There is no error during when DUT and other PC transmit data.	PASS	
		Receive		PASS	
	Band rate	9600	1. There is no error during the process at different band rate.	PASS	
		38400		PASS	
		115200		PASS	
	Function after Reboot			1. It can work properly as former status.	PASS

RS-485

Item		Criteria	Result	Notes	
COM1	Data Transfer	Send	PASS		
		Receive	PASS		
	Cable Lenth ( 1200 meter )		1. There is no error during when DUT and other PC transmit data.	PASS	
	Band rate	9600	1. There is no error during the process at different band rate.	PASS	
		38400		PASS	
		115200		PASS	
	Function after Reboot		1. It can work properly as former status.	PASS	
COM2	Data Transfer	Send	PASS		
		Receive	PASS		
	Cable Lenth ( 1200 meter )		1. There is no error during when DUT and other PC transmit data.	PASS	
	Band rate	9600	1. There is no error during the process at different band rate.	PASS	
		38400		PASS	
		115200		PASS	
	Function after Reboot		1. It can work properly as former status.	PASS	

## 2.09 M.2 Function

### 2.09.1.01 Test Purpose :

Evaluate whether the PCI-Ex1 slot function are workable and maintained in a stable condition.

### 2.09.1.02 Test Tool or Equipment

1. M.2 E Key Wireless LAN and Bluetooth Module Card (AIW-170BQ-001)
2. M.2 M Key 2280 NVME SSD (SQF-C8MV2-256GDEFM)
3. M.2 M Key 2242 NVME SSD (SQF-C4MV4-2TDEDM, QE.NO: EX-A01148)
4. M.2 B Key 3052 5G Sub 6 Module (AIW-356DQ-E01)

### 2.09.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.09.1.04 Test Procedure:

#### (For WLAN type device)

1. Install the M.2 card.
2. Boot up the system with the test device.
3. Examine the functionality of the test device.
4. Establish an Internet link by connecting to an effective wireless access point.
5. The system must always maintain a stable condition without any system crash, hang, blue screen, restart or any other problems.

#### (For Storage type M.2 device)

1. Insert M.2 device into DUT.
2. Boot into OS check M.2 can be detected with correct information.

#### (For Bluetooth type device)

1. Establish the Bluetooth connection with others of BT devices.
2. Examine the BT devices function.

#### (For 4G/5G type M.2 device)

3. Insert M.2 device into DUT.
4. Boot into OS check M.2 can be detected with correct information.

**2.09.1.05 Test Result:**

Test Item	Description	Loction	Result	Notes
M.2 E Key	PCIe: WIFI Test Device: AIW-170BQ-001	M2E1	<b>PASS</b>	
	USB: Bluetooth Test Device: AIW-170BQ-001		<b>PASS</b>	
M.2 M Key 2280	PCIe x4: NVME device Test Device: SQF-C8MV2-256GDEFM	M2M2	<b>PASS</b>	
M.2 M Key 2242	PCIe x1: NVME device Test Device: SQF-C4MV4-2TDEDM (EX-A01148)	M2M1	<b>PASS</b>	
M.2 B Key 3052	USB: 5G Sub 6 Module Test Device: AIW-356DQ-E01	M2B1	<b>PASS</b>	

## 2.10 GPIO Test

### 2.10.1.01 Test Purpose :

Evaluate whether the GPIO function are workable and maintained in a stable condition.

### 2.10.1.02 Test Tool or Equipment:

1. GPIO Loopback

### 2.10.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.10.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Connect the GPIO Loopback to the DIO port on the DUT and set GPIO as follow:

Short the Pin1 and Pin5 (Pin1 --> 300, Pin5 --> 308)

Short the Pin2 and Pin6 (Pin2 --> 301, Pin6 --> 309)

Short the Pin3 and Pin7 (Pin3 --> 302, Pin7 --> 310)

Short the Pin4 and Pin8 (Pin4 --> 303, Pin8 --> 311)

3. Run the command to test.

For the Pin1 and Pin5:

```
# echo 300 > /sys/class/gpio/export
```

```
# echo 308 > /sys/class/gpio/export
```

```
# echo out > /sys/class/gpio/gpio300/direction
```

```
# echo in > /sys/class/gpio/gpio308/direction
```

```
# echo 1 > /sys/class/gpio/gpio300/value
```

```
# cat /sys/class/gpio/gpio308/value (Have to return '1')
```

```
# echo 0 > /sys/class/gpio/gpio300/value
```

```
# cat /sys/class/gpio/gpio308/value (Have to return '0')
```

4. Check the GPIO function after reboot / wakeup.

**2.10.1.05 Test Result:**

Item	Criteria	Result	Notes
GPIO	1. According to step2 and 3, set the value of the GPIO1/2/3/4 to be "1". 2. According to step2 and 3, read the value of the GPIO5/6/7/8 should be "1". 3. According to step2 and 3, set the value of the GPIO1/2/3/4 to be "0". 4. According to step2 and 3, read the value of the GPIO5/6/7/8 should be "0".	<b>PASS</b>	
Reboot	GPIO function normal after reboot.	<b>PASS</b>	
Wake up	GPIO function normal after wake up.	<b>PASS</b>	

## 2.11 CAN-Bus Test

### 2.11.1.01 Test Purpose :

Evaluate whether the CAN-Bus function is workable and maintained in a stable condition.

### 2.11.1.02 Test Tool or Equipment:

1. 4m CAN cable (QE.NO: PE-A01058)
2. PEAK SYSTEM PCAN-USB-FD (QE.NO: PE-A01019)

### 2.11.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.11.1.04 Test Procedure:

1. Power on the device and boot into OS.
2. Use a 4m CAN cable to connect the CAN port of the PEAK SYSTEM PCAN-USB-FD to the CAN port on the DUT.
3. Connect the USB port of PEAK SYSTEM PCAN-USB-FD to the PC.
4. Install the driver for PEAK-System PCAN-USB-FD on the PC.
5. Run the test program "PCAN-View.exe" on the PC and set the bitrate to 1000K.
6. On the DUT terminal, run the following commands to set up the CAN port:  
# sudo su  
# modprobe can  
# modprobe can-dev  
# modprobe mttcan  
# ip link set can0 type can bitrate 1000000  
# ip link set can0 up
7. On the DUT, run the following command to receive data from the PEAK-System PCAN-USB-FD:  
# candump can0
8. Run the test program "PCAN-View.exe" on the PC and set the bitrate to 1000K.
9. On the DUT terminal, run the following commands to reconfigure CAN bitrate:  
# sudo su  
# modprobe can  
# modprobe can-dev  
# modprobe mttcan  
# ip link set can0 type can bitrate 1000000  
# ip link set can0 up

10. Send data from the CAN port on the DUT and receive it on the PEAK-System PCAN-USB-FD:

```
# cansend can0 123#0011223344556677
```

#### 2.11.1.05 Test Result:

Port	Item	Criteria	Result	Notes
CAN-Bus	Baud rate 1000K	There is no error	<b>PASS</b>	
	Function after reboot	There is no error	<b>PASS</b>	

## 2.12 RTC

### 2.12.1.01 Test Purpose :

Evaluate whether the RTC functions are working and are maintained in a stable condition.

### 2.12.1.02 Test Tool or Equipment:

1. N/A

### 2.12.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.12.1.04 Test Procedure:

1. Power on DUT and boot into OS.
2. Connect a LAN cable from the DUT to DHCP server.
3. Get a dynamic IP from DHCP server.
4. Type cmd to disable ntp service in DUT.  
# sudo timedatectl set-ntp false
5. Synchronize system time and RTC time with NTP server.  
# sudo ntpdate tock.stdtime.gov.tw  
# sudo hwclock -w
6. Keep the DUT on for 24 hours.
7. Synchronize system time and RTC time with NTP server again and check inaccuracies.  
# sudo ntpdate tock.stdtime.gov.tw && sudo hwclock -s && sudo ntpdate -u tock.stdtime.gov.tw
8. Keep the DUT off for 24 hours.
9. Synchronize system time and RTC time with NTP server again and check inaccuracies.  
# sudo ntpdate tock.stdtime.gov.tw && sudo hwclock -s && sudo ntpdate -u tock.stdtime.gov.tw

### 2.12.1.05 Test Result:

Test Item	Criteria	Result	Notes
Calibrate RTC Timer	The timer should work properly no any deviation for 3 times.	PASS	
RTC Timer Power on 24 hours (no network)	RTC time must -11 ~ +20 seconds / day under room temperature.	PASS	
RTC Timer Power off 24 hours	RTC time must -11 ~ +20 seconds / day under room temperature.	PASS	

## 2.13 Button

### 2.13.1.01 Test Purpose :

The purpose of this test is to examine the Buttons function of the platform.

### 2.13.1.02 Test Tool or Equipment:

1. N/A

### 2.13.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.13.1.04 Test Procedure:

1. Power on DUT and boot into OS.
2. Press the Button and evaluate whether the system situation is corresponded with the function of the button.

### 2.13.1.05 Test Result:

Item	Criteria	Result	Notes
Power Button	System can power on and off while pressing power button.	<b>PASS</b>	

## 2.14 Camera

### 2.14.1 MIPI CSI Over TypeC Camera

#### 2.14.1.01 Test Purpose :

Evaluate whether the MIPI CSI Over TypeC Camera function are workable and maintained in a stable condition.

#### 2.14.1.02 Test Tool or Equipment:

1. MIPI CSI Over TypeC Camera module

#### 2.14.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 2.14.1.04 Test Procedure:

1. Insert MIPI CSI Over TypeC camera module into DUT.
2. Power on DUT and boot into OS.
3. Run the command to setup driver with MIPI.
 

```
# cd /usr/local/bin/approcam/mipi/
# sudo ./set_approcam_mipi.sh
```
4. Run the command to preview.
 

```
# cd /home/ubuntu
# sudo ./enable-aprocamera.sh 1920 1080
```

#### 2.14.1.05 Test Result:

Item	Criteria	Result	Notes
MIPI-C Left Port	The function can work and no error.	PASS	
MIPI-C Right Port		PASS	
Dual MIPI-C Left Port + MIPI-C Right Port		PASS	

## 2.14.2 GMSL TypeC Camera

### 2.14.2.01 Test Purpose :

Evaluate whether the GMSL TypeC Camera function are workable and maintained in a stable condition.

### 2.14.2.02 Test Tool or Equipment:

1. GMSL Camera module

### 2.14.2.03 Testing Configuration:

1. Test environment: Room temperature

### 2.14.2.04 Test Procedure:

1. Insert GMSL camera module into DUT.
2. Power on DUT and boot into OS.
3. Run the command to setup driver with GMSL.  

```
# cd /usr/local/bin/approcam/gmsl/
# sudo ./set_approcam_gmsl.sh
```
4. Run the command to preview.  

```
# cd /home/ubuntu
# sudo ./enable-approcamera.sh 1920 1080
```

### 2.14.2.05 Test Result:

Item	Criteria	Result	Notes
GMSL Left Port	The function can work and no error.	PASS	
GMSL Right Port		PASS	
Dual GMSL Left Port + GMSL Right Port		PASS	

## 2.15 TPM Function

### 2.15.1.01 Test Purpose :

Evaluate whether the TPM are working and are maintained in a stable condition.

### 2.15.1.02 Test Tool or Equipment:

1. N/A

### 2.15.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.15.1.04 Test Procedure:

1. Power on DUT and boot into OS.
2. Run the command to Pre-install TPM-tools.  
# apt install --yes tpm2-tools
3. Run the command to check the TPM function.

### 2.15.1.05 Test Result:

Test Item	Criteria	Result	Notes
TPM	There is no error by test.	<b>PASS</b>	

## 2.16 SIM Holder Function

### 2.16.1.01 Test Purpose :

Evaluate whether the SIM Holder are working and are maintained in a stable condition.

### 2.16.1.02 Test Tool or Equipment:

1. M.2 Key B 5G Sub 6 Module (AIW-356DQ-E01)
2. SIM card

### 2.16.1.03 Testing Configuration:

1. Test environment: Room temperature

### 2.16.1.04 Test Procedure:

1. Insert SIM card into SIM holder.
2. Install 4G/5G Module into DUT.
3. Boot into OS and check 4G/5G network by connect to internet.

### 2.16.1.05 Test Result:

Test Item	Criteria	Result	Notes
SIM Holder	There is no error by test with 4G/5G Module.	<b>PASS</b>	

## Chapter 3 : Performance Test

### 3.01 MicroSD Performance

#### 3.01.1.01 Test Purpose :

The purpose of this test is to validate and ensure the MicroSD card performance of the DUT.

#### 3.01.1.02 Test Tool or Equipment:

1. MicroSD card

#### 3.01.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 3.01.1.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Connect MicroSD Card to MicroSD slot.
3. Check the space of MicroSD card.  
# fdisk -l
4. Mount MicroSD card.  
# mkdir /mnt/sdcard  
# mount /dev/sda /mnt/sdcard
5. Make sure system can detect the MicroSD Card and can be access.  
# dd if=/dev/zero of=/mnt/sdcard/testFile bs=1M count=1000  
# dd if=/mnt/ sdcard /testFile of=/dev/zero bs=1M

(If dd command does not show read/write speed, use “time dd ...” to measure the time.)

#### 3.01.1.05 Test Result:

Item	Criteria	Result	Notes
MicroSD Card	Read 1048576000 bytes (1.0GB, 1000 MiB) copied, 31.4081 s, 33.4 MB/s	PASS	
	Write 1048576000 bytes (1.0GB, 1000 MiB) copied, 56.3524 s, 18.6 MB/s	PASS	

## 3.02 M.2 Performance

### 3.02.1.01 Test Purpose :

The purpose of this test is to validate and ensure the M.2 performance of the DUT.

### 3.02.1.02 Test Tool or Equipment:

1. M.2 M Key 2280 NVME SSD (Advantech SQF-C8MV2-256GDEFM)
2. M.2 M Key 2242 NVME SSD (Advantech SQF-C4MV4-2TDEDC, QE.NO: EX-A01112)

### 3.02.1.03 Testing Configuration:

1. Test environment: Room temperature

### 3.02.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Check the space of attached M.2 NVME device.  
# fdisk -l
3. Run command to read/write 1G file on M.2 NVME device. Record the read/write speed in Notes below.  
# mkdir /mnt/M2  
# mount /dev/nvme0n1p2 /mnt/M2  
# dd if=/dev/zero of=/mnt/M2/testFile bs=1M count=1000  
# dd if=/mnt/M2/testFile of=/dev/zero bs=1M  
(If dd command does not show read/write speed, use “time dd ...” to measure the time.)

### 3.02.1.05 Test Result:

Item	Criteria	Loction	Result	Notes
M.2 Storage	Read 1048576000 bytes (1.0GB, 1000 MiB) copied,1.40111 s, 748 MB/s	M2M1	PASS	
	Write 1048576000 bytes (1.0GB, 1000 MiB) copied, 1.05983 s, 989 MB/s		PASS	
	Read 1048576000 bytes (1.0GB, 1000 MiB) copied, 0.47525 s, 2.2 GB/s	M2M2	PASS	
	Write 1048576000 bytes (1.0GB, 1000 MiB) copied, 1.06244 s, 987 MB/s		PASS	

## 3.03 Ethernet Performance

### 3.03.1.01 Test Purpose :

The purpose of this test is to validate the Ethernet performance of the DUT.

### 3.03.1.02 Test Tool or Equipment:

1. Cable length: Cat.5E (3m)

### 3.03.1.03 Testing Configuration:

1. Test environment: Room temperature
2. Test tool: iperf3

### 3.03.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Connect the iPerf server (PC) and the client (DUT) using the LAN cable.
3. Run the command to set the client (DUT) IP address to 192.168.1.1.  
# ifconfig enP8p1s0 192.168.1.1
4. Run the command to set iPerf server (PC) IP address to 192.168.1.2.  
# ifconfig enP8p1s0 192.168.1.2
5. DUT Send test:  
Server: PC  
# iperf3 -s -i 1  
Client: DUT  
# iperf3 -c 192.168.1.2 -t 60 -P 2  
Waiting 60 seconds to check LAN throughput speed.
6. DUT Receive test:  
Server: DUT  
# iperf3 -s -i 1  
Client: PC  
# iperf3 -c 192.168.1.1 -t 60 -P 2  
Waiting 60 seconds to check LAN throughput speed.

**3.03.1.05 Test Result:**

Item	Criteria	Result	Notes
LAN1	Tx speed 809 Mbits/sec	<b>PASS</b>	
	Rx speed 808 Mbits/sec	<b>PASS</b>	
LAN2	Tx speed 2.30 Gbits/sec	<b>PASS</b>	
	Rx speed 2.29 Gbits/sec	<b>PASS</b>	

## Chapter 4 : Compatibility Test

### 4.01 MicroSD Compatibility

#### 4.01.1.01 Test Purpose :

The purpose of this test is to validate and ensure the MicroSD card compatibility of the DUT.

#### 4.01.1.02 Test Tool or Equipment:

1. MicroSD card

#### 4.01.1.03 Testing Configuration:

1. Test environment: Room temperature

#### 4.01.1.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Connect MicroSD Card to MicroSD slot.
3. Check the space of MicroSD card.  
# fdisk -l
4. Mount MicroSD card.  
# mkdir /mnt/sdcard  
# mount /dev/sda /mnt/sdcard
5. Make sure system can detect the MicroSD Card and can be access.  
# dd if=/dev/zero of=/mnt/sdcard/testFile bs=1M count=1000  
# dd if=/mnt/ sdcard /testFile of=/dev/zero bs=1M
6. Repeat step3 to test different MicroSD card.

#### 4.01.1.05 Test Result:

Test Item Description					Criteria	Result	Notes
Brand Name	Model/Spec	Capacity	Speed	QE NO.			
Advantech	SQF-MSDV4-256GDD2C	256GB	Class 10	MC-A00452	There is no error by test	PASS	
Advantech	SQF-MSDM1-64G-21C	64GB	Class 10	MC-A00388		PASS	
Samsung	MB-MJ128KA/APC	128GB	Class 10	MC-A00463		PASS	
Transcend	TS256GUSD460T-VS1	256GB	Class 10	MC-A00469		PASS	

## 4.02 USB Compatibility

### 4.02.1.01 Test Purpose :

The purpose of this test is to validate and ensure the USB devices compatibility of the DUT.

### 4.02.1.02 Test Tool or Equipment:

1. USB Storage Device

### 4.02.1.03 Testing Configuration:

1. Test environment: Room temperature

### 4.02.1.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Connect USB Storage to USB.
3. Make sure system can detect the USB Storage and can be access.
4. Repeat step2 to step3 to test.

### 4.02.1.05 Test Result:

Category	Capacity	Vendor	Model	ADVANTECH P/N	Bandwidth_Performance	Result	Notes
Flash Disk	16GB	SanDisk	SDCZ50-016G	N/A	USB2.0	PASS	
Flash Disk	32GB	Apacer	AH11J	N/A	USB2.0	PASS	
Flash Disk	128GB	ADATA	UV350	N/A	USB3.2 Gen1x1(USB3.0)	PASS	
Flash Disk	512GB	Transcend	TS512GESD320A	N/A	USB3.2 Gen2x1	PASS	
Flash Disk	256GB	Kingston	DTMAX	N/A	USB3.2 Gen2x1	PASS	

## 4.03 Monitor Compatibility

### 4.03.1.01 Test Purpose :

The purpose of this test is to validate and ensure the compatibility of the HDMI Graphic Interface.

### 4.03.1.02 Test Tool or Equipment:

1. HDMI Monitor

### 4.03.1.03 Testing Configuration:

1. Test environment: Room temperature

### 4.03.1.04 Test Procedure:

1. Use the HDMI cable to connect the HDMI Monitor.
2. Boot into OS and use build-in GUI to change resolution.
3. Play a video to check the HDMI audio output.

### 4.03.1.05 Test Result:

#### HDMI:

Brand and Model		Signal type	Test Item		Result	Notes
Brand.	Samsung	HDMI	Power on initial test. (cold boot)		PASS	
			Power on initial test. (warm boot)		PASS	
Model.	S27A700NWC		Resolution Change & Display Quality Check.	1920x1080, 60Hz	PASS	
Size.	27"			3840x2160, 60Hz	PASS	
QE No.	DI-A00219		HDMI-Audio Function Check		PASS	
Brand.	BenQ	HDMI	Power on initial test. (cold boot)		PASS	
			Power on initial test. (warm boot)		PASS	
Model.	EL2870U		Resolution Change & Display Quality Check.	1920x1080, 60Hz	PASS	
Size.	28"			3840x2160, 60Hz	PASS	
QE No.	DI-A00210		HDMI-Audio Function Check		PASS	

## Chapter 5 : Reliability Test

### 5.01 System On/Off Test

#### 5.01.1 Power cycle test

##### 5.01.1.01 Test Purpose :

Confirm whether the DUT restarts normally with the AC on/off test.

##### 5.01.1.02 Test Tool or Equipment:

1. Power on/off test equipment (ATX/AT)

##### 5.01.1.03 Testing Configuration:

1. Test environment: Room temperature

##### 5.01.1.04 Test Procedure:

1. Connect power cable of DUT to auto on/off machine.
2. Set boot time for 120 sec; off time for 15 sec for auto on/off machine.
3. During the boot time, DUT should enter OS environment.
4. During the off time, keep DUT off.
5. Repeat steps 4~5 for 1000 round time.

##### 5.01.1.05 Test Result:

Item	Criteria	Result	Notes
AT power cycle test	No error happened in 1000 times	PASS	
ATX power cycle test		PASS	

## 5.01.2 Reboot Stress Test

### 5.01.2.01 Test Purpose:

The purpose of this test is to analyze and validate the functional 、 performance capabilities 、 quality and stability of DUT warm boot capability.

### 5.01.2.02 Test Tool or Equipment:

1. N/A

### 5.01.2.03 Testing Configuration:

1. Test environment: Room temperature

### 5.01.2.04 Test Procedure:

1. Power on the device and boots into OS.
2. Execute the warm boot test for 1000 cycles.

### 5.01.2.05 Test Result:

Item	Criteria	Result	Notes
Reboot stress test	No error happened in 1000 times.	<b>PASS</b>	

## 5.02 CPU Stress Test

### 5.02.1.01 Test Purpose :

The purpose of this test is to stress and ensure the stability of the CPU.

### 5.02.1.02 Test Tool or Equipment

1. stress-ng

### 5.02.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.02.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Run the command to perform a CPU burn-in test for 12 hours under the OS.  
# stress-ng -c 8 -l 100 -t 999999 ; read -t 1800

### 5.02.1.05 Test Result:

Item	Criteria	Result	Notes
CPU stress test	Burn-in for 12 hours. The DUT MUST maintain a stable condition after the test has been completed.	<b>PASS</b>	

## 5.03 Memory Stress Test

### 5.03.1.01 Test Purpose :

The purpose of this test is to stress and ensure the stability of the Memory.

### 5.03.1.02 Test Tool or Equipment :

1. memtester

### 5.03.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.03.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Run the command to perform a memory burn-in test for 12 hours under the OS.

For NX 16GB:

```
# memtester 14G 500
```

For NX 8GB:

```
# memtester 6G 500
```

### 5.03.1.05 Test Result:

Item	Criteria	Result	Notes
Memory stress test	Burn-in for 12 hours. The DUT MUST maintain a stable condition after the test has been completed.	<b>PASS</b>	

## 5.04 Graphic Stress Test

### 5.04.1.01 Test Purpose :

The purpose of this test is to stress and ensure the stability of the Graphic Interface.

### 5.04.1.02 Test Tool or Equipment:

1. HDMI Monitor

### 5.04.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.04.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Run the command to perform a graphic burn-in test for 12 hours under the OS.  
# /usr/local/bin/matrixMulCUBLAS --sizemult=8

### 5.04.1.05 Test Result:

Item	Criteria	Result	Notes
Graphic stress test	Burn-in for 12 hours. The DUT MUST maintain a stable condition after the test has been completed.	<b>PASS</b>	

## 5.05 COM Port Stress Test

### 5.05.1.01 Test Purpose :

The purpose of this test is to stress and ensure the stability of the Serial Port.

### 5.05.1.02 Test Tool or Equipment

1. RS232 loopback testing fixture
2. Test tool: Burnin.sh

### 5.05.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.05.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Run the command to perform a COM port stress test for 12 hours under the OS.

### 5.05.1.05 Test Result:

Item	Criteria	Result	Notes
COM1	Burn-in for 12 hours. The DUT MUST maintain a stable condition after the test has been completed.	PASS	
COM2		PASS	

## 5.06 LAN Stress Test

### 5.06.1.01 Test Purpose :

The purpose of this test is to examine the LAN performance and to ensure the quality and stability of the Ethernet controllers.

### 5.06.1.02 Test Tool or Equipment:

1. LAN Cable length: Cat.6 (100m)
2. Ubuntu server
3. Test tool: iperf3

### 5.06.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.06.1.04 Test Procedure:

1. Power on the device and boots into OS.
2. Connect the iPerf server (PC) and the client (DUT) using the LAN cable.
3. Run the command to set the client (DUT) IP address to 192.168.1.1.  
# ifconfig enP8p1s0 192.168.1.1  
# ifconfig enP9p1s0 198.18.1.1
4. Run the command to set iPerf server (PC) IP address to 192.168.1.2.  
# ifconfig enP8p1s0 192.168.1.2  
# ifconfig enP9p1s0 198.18.1.2
5. DUT Send test:  
Server: PC  
# iperf3 -s -i 1 -p 5201  
# iperf3 -s -i 1 -p 5202  
Client: DUT  
# iperf3 -c 192.168.1.2 -t 43200 -P 2 -p 5201  
# iperf3 -c 198.18.1.2 -t 43200 -P 2 -p 5202  
Waiting 12 hours to check LAN stability.
6. DUT Receive test:  
Server: DUT  
# iperf3 -s -i 1 -p 5201  
# iperf3 -s -i 1 -p 5202  
Client: PC  
# iperf3 -c 192.168.1.1 -t 43200 -P 2 -p 5201

```
# iperf3 -c 198.18.1.1 -t 43200 -P 2 -p 5202
```

Waiting 12 hours to check LAN stability.

**5.06.1.05 Test Result:**

Item	Criteria	Result	Notes
LAN1	Burn-in for 12 hours. The DUT MUST maintain a stable condition after the test has been completed.	<b>PASS</b>	
LAN2		<b>PASS</b>	

## 5.07 System Stress Test

### 5.07.1.01 Test Purpose :

The purpose of this test is to examine the System Stress Test and to ensure the quality and stability of the System.

### 5.07.1.02 Test Tool or Equipment:

1. RS-232 loopback testing fixture
2. CAN-Bus Cable
3. LAN Cable length: Cat.6 (100m)
4. GPIO loopback testing fixture
5. HDMI Monitor
6. Test tool: Burnin.sh

### 5.07.1.03 Testing Configuration:

1. Test environment: Room temperature

### 5.07.1.04 Test Procedure:

1. Turn on the power and boot to OS.
2. Run burnin.sh program.

### 5.07.1.05 Test Result:

Item	Criteria	Result	Notes
System Stress Test	<b>CPU/GPU/Memory/LANs/CAN/GPIO/COMs:</b> The platform must pass the stress test over 12 hours. And MUST maintain a stable condition after the test has been completed. *Test by burnin.sh program	<b>PASS</b>	