

# TEST REPORT

**This laboratory is accredited by National Radio Research  
Agency Laboratory and National Voluntary Laboratory  
Accreditation Program.**

The tests reported herein have been performed in accordance with  
its terms of accreditation.

Test Report No. : LR500112309B  
Issue Date : September 25, 2023  
Applied Standard : FCC Part 15, Subpart B & ICES-003 (Issue.7)  
Trade Name : Hanwha Vision Co., Ltd  
Equipment Name : Network Video Recorder  
Model Name : XRN-3220B4  
Additional Model Name : -  
Serial Number : Identification

**This test result only responds to the tested sample. It is not allowed to copy this report even partly without the  
allowance of the test laboratory.**

**This test report is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.**

### Revision history

| Revision | Date of issue | Test report No. | Description                          |
|----------|---------------|-----------------|--------------------------------------|
| 0        | 31.07.2023    | LR500112307H    | Initial                              |
| 1        | 09.08.2023    | LR500112309B    | Change hardware parts (PCBs and fan) |



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## LTA Certification

### Applicant

Company name : Hanwha Vision Co., Ltd  
Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, KOREA  
Telephone / Facsimile : +82-10-2667-4196 / +82-70-7147-8361

### Factory #1

Company name : HANWHA VISION VIETNAM COMPANY LIMITED  
Address : Lot O-2, Que Vo Industrial Zone extended area ,Nam Son commune, Bac Ninh city,Bac Ninh province, Vietnam

### Factory #2

Company name : D-TECH CO.,LTD.  
Address : 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

### Equipment Under Test (EUT)

Equipment Name : Network Video Recorder  
Model Name : XRN-3220B4  
Additional Model Name : -  
Serial number : Identification  
Intended environment : Residential area  
Date of receipt : August 31, 2023  
EUT condition : Pre-production, not damaged  
Test Mode : Operating mode  
Interface ports : AC IN, HDMI #1, #2, ALARM IN, ALARM OUT, AUDIO OUT, USB #1 ~ #4, NETWORK #1 ~ #3, Console(Unused)  
Power rating : AC 120 V, 60 Hz  
Test Voltage : AC 120 V, 60 Hz

### Model Description

- NONE

### Model Specification

- The console port of the device to be tested is a port for administrators and is excluded from the test item.

\*\*\* To be continued next page \*\*\*

**LTA Certification –cont.-****Test Performed**

Test started & completed : September 15 - 21, 2023  
Location : LTA Co., Ltd.

**Test Specification**

Purpose of the test : Compliance test to the following standard  
Applied standard : FCC Part 15, Subpart B & ICES-003 (Issue.7)  
Classification : Class A  
Deviations from Standard Test Method : N/A

**Test Results**

| Measurement         | Results* | Test method                       |
|---------------------|----------|-----------------------------------|
| Conducted Emissions | Complies | ANSI C 63.4<br>ICES-003 (Issue.7) |
| Radiated Emissions  | Complies | ANSI C 63.4<br>ICES-003 (Issue.7) |

\* : The compliance statement is based on nominal value only.

**Modification performed by the lab.;**

- Supplementary area: gasket tape inside the device / Material: gasket tape (model name: N/A, manufacturer: N/A number: 1 EA)

**Laboratory's Certificate**

Project number : 230831-0146  
Issue date : September 25, 2023

This test report is issued under the authority of:

The test was supervised by:



Young Kyu Shin, Technical Manager



Hyun Young Ahn, Test Engineer

The results in this report apply only to the sample(s) tested.

It is not allowed to copy this report even partly without the allowance of the test laboratory.

## General information's

### Purpose

This document is based on the Electromagnetic Interference (EMI) tests performed on the “**XRN-3220B4**”. The measurements were performed according to the measurement procedure described in ICES-003 and ANSI C 63.4. The tests were carried out in order to confirm whether the electromagnetic emissions from the EUT (Equipment Under Test), are within the Class A limits defined in ICES-003 and FCC Part 15.

### Test Performed

Company name : **LTA Co., Ltd.**  
Address : 4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea  
Telephone : +82-31-323-6008  
Facsimile : +82-31-323-6010

### Measurement uncertainty

Conducted Emissions (0.15 to 30 MHz) :  $\pm 2.81$  [dB] (k=2)  
Radiated Emissions (30 to 1,000 MHz) : H :  $\pm 4.62$  [dB] (k=2) V :  $\pm 4.85$  [dB] (k=2)  
(1 GHz to 6 GHz) : H :  $\pm 5.65$  [dB] (k=2) V :  $\pm 5.68$  [dB] (k=2)  
(6 GHz to 18 GHz) : H :  $\pm 5.90$  [dB] (k=2) V :  $\pm 5.74$  [dB] (k=2)

The coverage factor k=2 yields approx. a 95% level of confidence for near-normal distribution typical of most measurement results.

### Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

| Agency | Country | Accreditation No. | Validity   | Reference             |
|--------|---------|-------------------|------------|-----------------------|
| RRA    | KOREA   |                   | -          | RRA accredited Lab.   |
|        | U.S.A   | KR0049            | 2025-03-29 |                       |
|        | CANADA  |                   | 2024-08-15 |                       |
| VCCI   | JAPAN   | C-14948           | 2026-09-10 | VCCI registration     |
|        |         | T-12416           | 2026-09-10 |                       |
|        |         | R-14483           | 2026-10-15 |                       |
|        |         | G-10847           | 2024-12-13 |                       |
| KOLAS  | KOREA   | KT551             | 2025-10-12 | KOLAS accredited Lab. |

## 1- Brief Information

### 1-1 Test Summary

| Parameter                                                                                                                                                      | Applied Standard                        | Status<br>(note 1) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------|
| <b>I. Emission</b>                                                                                                                                             |                                         |                    |
| Conducted Emissions                                                                                                                                            | FCC Part 15.107 / ICES-003 Clause 3.2.1 | C                  |
| Radiated Emissions                                                                                                                                             | FCC Part 15.109 / ICES-003 Clause 3.2.2 | C                  |
| Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable<br>* The data in this test report are traceable to the national or international standards. |                                         |                    |

#### Frequency range to be scanned:

0.15 MHz - 30 MHz as conducted measurement

30 MHz to 5<sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower as radiated measurement.

#### Bandwidth:

Measured by the CISPR quasi-peak function Bandwidth is 9 kHz in the frequency 0.15 MHz to 30 MHz and 120 kHz in the frequency 30 MHz to 1,000 MHz.

Measured by the Peak function Bandwidth is 1 MHz in the frequency 1 GHz to 40 GHz.

#### A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

### 1-2 Test mode of the EUT

The tests have been conducted with the following operational mode(s) of the EUT.

Operating mode

### 1-3 Modification

- Supplementary area: gasket tape inside the device to be tested / Material: gasket tape (model name: N/A, manufacturer: N/A number: 1EA) / Use gasket tape directly to supplement noise suppression on the marked area of the picture.

#### 1-4 List of EUT and ACCESSORY

| EUT                    |                  |                     |                                                             |         |
|------------------------|------------------|---------------------|-------------------------------------------------------------|---------|
| Equipment Name         | Model Name       | Serial No.          | Manufacturer                                                | Remarks |
| Network Video Recorder | XRN-3320B4       | N/A                 | HANWHA VISION VIETNAM<br>COMPANY LIMITED<br>D-TECH CO.,LTD. | EUT     |
| Mouse                  | MOKJUO           | 34004812            | Primax Electronics Ltd.                                     | EUT     |
| ACCESSORY              |                  |                     |                                                             |         |
| Equipment Name         | Model Name       | Serial No.          | Manufacturer                                                | Remarks |
| NOTEBOOK               | ELITE BOOK       | N/A                 | HP                                                          | -       |
| MONITOR #1             | 6230VP           | 73010478A2<br>20371 | Lien Fong(Wujiang) Electronics<br>Co.,Ltd.                  | -       |
| MONITOR #2             | AM24MB           | N/A                 | ATEC                                                        | -       |
| Keyboard               | K120             | 1547SC5034<br>U8    | Logitech                                                    | -       |
| POE Injector           | ipTIMEPoE408     | POE408<br>4BC00624  | ipTIME                                                      | -       |
| POE Injector adapter   | ANY480A5C-NI     | N/A                 | Wendeng Any Electronics Co.,Ltd                             | -       |
| ALARM JIG #1           | N/A              | N/A                 | N/A                                                         | -       |
| ALARM JIG #2           | N/A              | N/A                 | N/A                                                         | -       |
| Earphone               | N/A              | N/A                 | N/A                                                         | -       |
| USB Memory Stick       | Cruzer Blade 8GB | N/A                 | SanDisk                                                     | 2 EA    |
| IP Camera #1           | LND-6032R        | ZNDJ6V4M<br>90000CM | HANWHA TECHWIN CO.,LTD.                                     | -       |
| IP Camera #2           | LND-6022R        | ZNDE6V4M<br>90000EV | HANWHA TECHWIN CO.,LTD.                                     | -       |



### 1-5 Cable List

| Cable List           |            |                      |               |            |           |
|----------------------|------------|----------------------|---------------|------------|-----------|
| From                 |            | To                   |               | Length (m) | Shielding |
| Type                 | I/O Port   | Type                 | I/O Port      |            |           |
| EUT                  | AC IN      | AC POWER SOURCE      | 3 PIN AC LINE | 1.0        | NO        |
| EUT                  | USB #1     | MOUSE                | -             | 1.0        | NO        |
| EUT                  | USB #2     | KEY BOARD            | -             | 1.0        | NO        |
| EUT                  | USB #3     | USB MEMORY STICK #1  | -             | -          | NO        |
| EUT                  | USB #3     | USB MEMORY STICK #2  | -             | -          | NO        |
| EUT                  | HDMI #1    | MONITOR #1           | HDMI          | 1.0        | YES       |
| EUT                  | HDMI #2    | MONITOR #2           | HDMI          | 1.0        | YES       |
| EUT                  | NETWORK #1 | POE INJECTOR         | LAN #1        | 3.0        | NO        |
| EUT                  | NETWORK #2 | NOTEBOOK             | LAN           | 3.0        | NO        |
| EUT                  | NETWORK #3 | POE INJECTOR         | LAN #2        | 3.0        | NO        |
| EUT                  | AUDIO OUT  | EAR PHONE            | -             | 1.0        | NO        |
| EUT                  | ALARM IN   | ALARM ZIG #1         | -             | 1.0        | NO        |
| EUT                  | ALARM OUT  | ALARM ZIG #2         | -             | 1.0        | NO        |
| POE INJECTOR         | DC IN      | POE INJECTOR ADAPTER | DC OUT        | 1.0        |           |
| POE INJECTOR ADAPTER | AC IN      | AC POWER SOURCE      | 2 PIN AC LINE | 1.0        | NO        |
| MONITOR #1           | AC IN      | AC POWER SOURCE      | 3 PIN AC LINE | 1.0        | NO        |
| MONITOR #2           | AC IN      | AC POWER SOURCE      | 3 PIN AC LINE | 1.0        | NO        |
| POE INJECTOR         | POE #1     | IP CAMERA #1         | LAN           | 1.0        | NO        |
| POE INJECTOR         | POE #2     | IP CAMERA #2         | LAN           | 1.0        | NO        |

## 2- Test Site Description

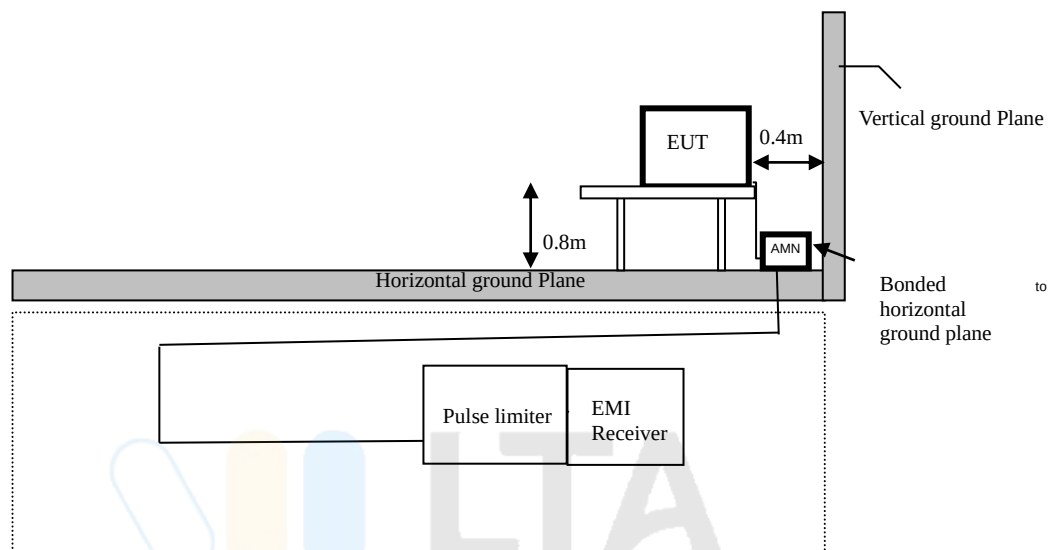
### 1-Facility

All the testing facilities are periodically serviced as a daily check for equipment and cables systems, an every 1 year facility check for the facilities and annual calibration for testing equipment according to ISO/IEC 17025. All the testing facilities are used as the same specifications shown below. There are descriptions both for radiated disturbance measurement and conducted disturbance measurement conformed by ANSI C 63.4.

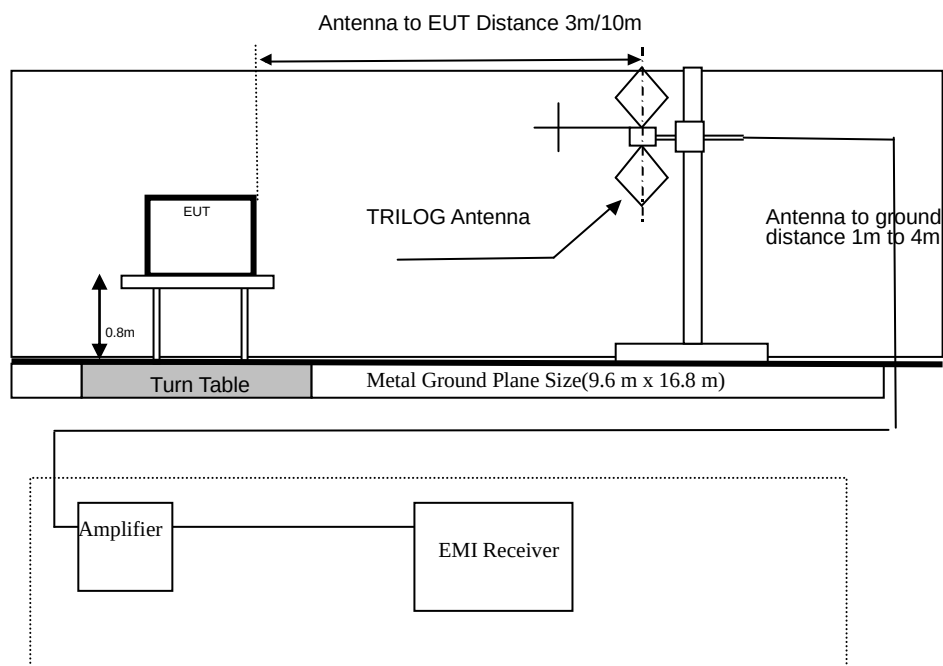
The NSA measurement of the 10 m chamber was performed on January 15, 2023 according to ANSI C 63.4.

The SVSWR measurement of the 10 m chamber was performed on October 16, 2022 according to ANSI C 63.4.

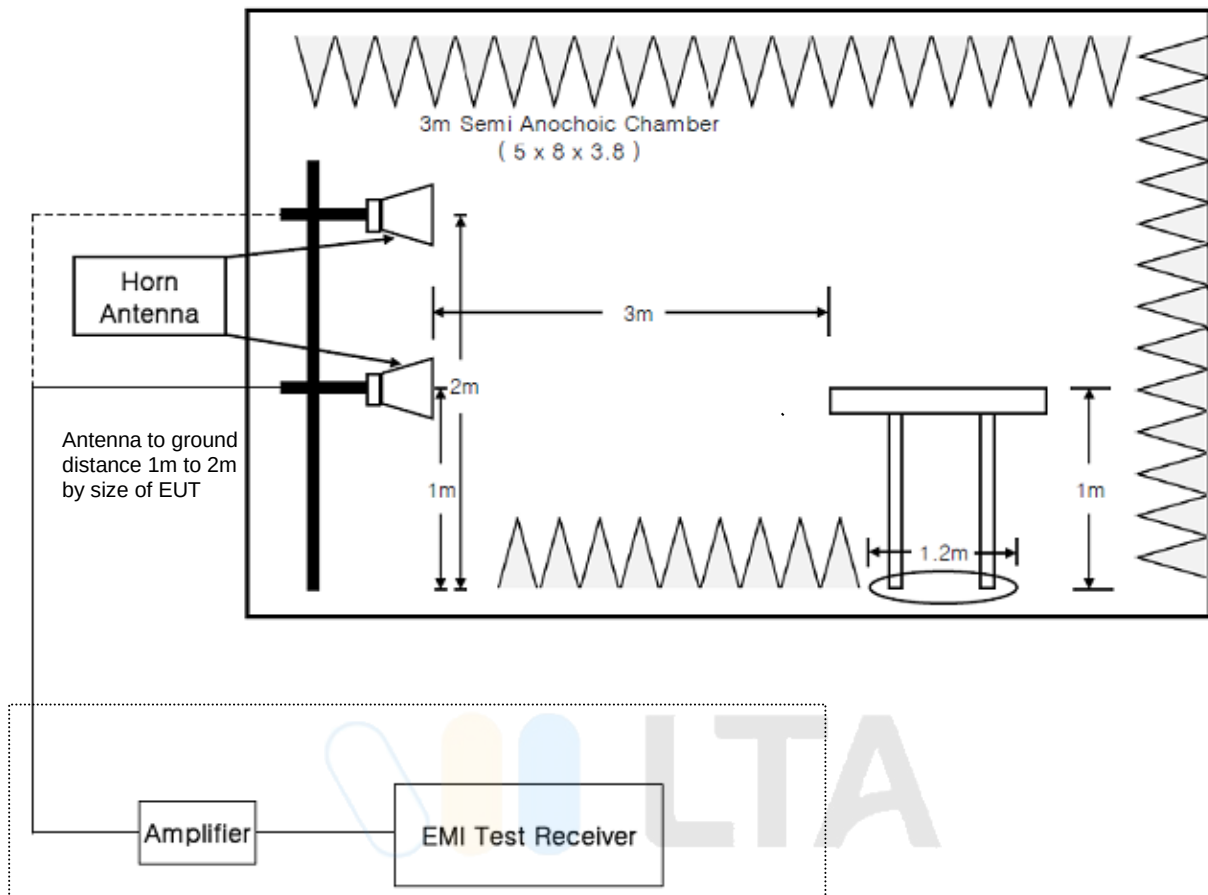
### 2-1 Conducted Emissions



### 2-2 Radiated Emissions – Below 1 GHz



## 2-3 Radiated Emissions – Above 1 GHz



### 3- Test Procedure

#### 3-1 Conducted Emissions

- The measurement is carried out on an open site with horizontal and metallic ground plane.
- An AMN(Artificial Mains Network) with a nominal impedance ( $50\ \Omega$  /  $50\ \mu\text{H}$ ) as defined in ANSI C 63.4, shall be utilized.
- The AMN is grounded on a horizontal metal ground plane.
- Measurement is carried out using an EMI receiver with quasi-peak detectors and average detector.  
(Refer to the List of test equipment used for the test.)
- The shortest distance between the EUT and the AMN is 0.8 m.
- The EUT is placed on the non-conducting table with 0.8 m height.
- Refer to "Brief Information"(page 7-9) about details of the EUT and configuration of the cables.
- Measurement is carried out as manual operation.
  - searching the maximum frequency point of the disturbance wave in each frequency range.
  - reading the disturbance level of quasi-peak, average and Line (L) and Neutral (N) in 9 kHz bandwidth by the EMI receiver.
  - calculating the measurement result with the following formula or equation.  
(Result = Reading + Cor.F.(LISN Factor + Cable Loss + Pulse Limiter)  
(ex)    =  $13.23\ \text{dB}\mu\text{V} + (9.63\ \text{dB} + 0.01\ \text{dB} + 9.86\ \text{dB})$   
          =  $32.73\ \text{dB}\mu\text{V}$

### 3-2 Radiated Emissions – Below 1 GHz

- Test site is met the requirements of ANSI C 63.4 and the distance between the EUT and the antenna is adjusted 3 m or 10 m.
  - The turntable can be rotated 360 degrees.
  - The antenna can be adjusted between 1 m and 4 m in height above the ground.
  - The EUT is placed on the non-conducting table with 0.8 m height on the turntable.
  - Measurements are carried out using an EMI receiver with quasi-peak detectors (120 kHz bandwidth).
  - Refer to the list of test equipment used for the test.
  - The TRILOG antenna are used as wideband antenna.
  - The TRILOG antenna is used in the frequency range of 30 MHz to 1 000 MHz.
  - A variable attenuator is used for verifying amplifier's linearity.
  - Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
  - Refer to "Brief Information"(page 7-9) about details of the EUT and configuration of the cables.
  - Measurement is carried out by a LTA operator as manual operation.
- searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
  - setting the height of the antenna with the maximum level of the disturbance wave from 1 m to 4 m.
  - reading the disturbance level by the EMI receiver with quasi-peak detectors (120 kHz bandwidth) according to ANSI C 63.4.
  - measuring to vertical and horizontal polarization.
  - calculating the measurement result with the following formula or equation:  
(Result = Reading + Cor.F (antenna factor + cable loss – PreAmp Gain)  
(ex) = 50.6 dB $\mu$ V/m + (11.08 dB(1/m) + 1.31 dB - 27.32 dB)  
= 35.67 dB $\mu$ V/m

### 3-3 Radiated Emissions – Above 1 GHz

- Test site is met the requirements of ANSI C 63.4 and the distance between the EUT and the antenna is adjusted 3 m.
- The turntable can be rotated 360 degrees.
- The antenna can be adjusted between 1 m and 4 m in height above the ground.
- The EUT is placed on the non-conducting table with 1 m height on the turntable.
- Measurements are carried out using an EMI receiver with peak and average detectors(1 MHz bandwidth).
- Refer to the list of test equipment used for the test.
- The HORN antenna are used as wideband antenna.
- The HORN antenna is used in the frequency range of 1 GHz to 18 GHz.
- A variable attenuator is used for verifying amplifier's linearity.
- Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
- Refer to "Brief Information"(page 7-9) about details of the EUT and configuration of the cables.
- Measurement is carried out by a LTA operator as manual operation.
  - searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
  - setting the height of the antenna with the maximum level of the disturbance wave from 1 m to 4 m
  - reading the disturbance level by the EMI receiver with peak and average detectors (1 MHz bandwidth) according to ANSI C 63.4.
  - measuring to vertical and horizontal polarization.
  - calculating the measurement result with the following formula or equation:  
(Result = Reading + Cor.F (antenna factor + cable loss – PreAmp Gain)  
(ex)     = 35.9 dBμV/m + (23.92 dB(1/m) + 7.01 dB - 38.33 dB)  
           = 28.5 dBμV/m

#### 4- List of Equipment Used For the Tests

##### Conducted Emissions

|                                     | Item              | Model Name           | Manufacturer    | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|-------------------|----------------------|-----------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | EMI TEST Receiver | ESR                  | Rohde & Schwarz | 101499      | 2024.03.13 | 1 year   |
| <input checked="" type="checkbox"/> | Pulse Limiter     | ESH3-Z2              | Rohde & Schwarz | 100710      | 2024.03.13 | 1 year   |
| <input type="checkbox"/>            | LISN              | ESH3-Z6              | Rohde & Schwarz | 100378      | 2024.08.22 | 1 year   |
| <input type="checkbox"/>            | LISN              | ESH3-Z6              | Rohde & Schwarz | 101468      | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | LISN(main)        | ENV216               | Rohde & Schwarz | 102872      | 2024.09.07 | 1 year   |
| <input checked="" type="checkbox"/> | LISN(sub)         | LT32C/10             | AFJ             | 32031518210 | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | TEST PROGRAM      | e3_ce 20181212a (V9) | AUDIX           | -           | -          | -        |

##### Radiated Emissions – Below 1 GHz

|                                     | Item              | Model Name        | Manufacturer    | Serial No. | Next Cal.  | Interval |
|-------------------------------------|-------------------|-------------------|-----------------|------------|------------|----------|
| <input checked="" type="checkbox"/> | EMI TEST Receiver | ESCI7             | Rohde & Schwarz | 100772     | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | Amplifier         | 8447D             | HP              | 1937A03453 | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | BILOG Antenna     | VULB 9168         | SCHWARZBECK     | 749        | 2025.03.29 | 2 year   |
| <input checked="" type="checkbox"/> | TEST PROGRAM      | e3 20181212a (V9) | AUDIX           | -          | -          | -        |

##### Radiated Emissions – Above 1 GHz

|                                     | Item              | Model Name        | Manufacturer    | Serial No. | Next Cal.  | Interval |
|-------------------------------------|-------------------|-------------------|-----------------|------------|------------|----------|
| <input checked="" type="checkbox"/> | EMI TEST Receiver | ESCI7             | Rohde & Schwarz | 100772     | 2024.08.22 | 1 year   |
| <input type="checkbox"/>            | EMI TEST Receiver | ESU               | Rohde & Schwarz | 100092     | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | Amplifier         | 8449B             | Agilent         | 3008A02126 | 2024.03.14 | 1 year   |
| <input type="checkbox"/>            | Amplifier         | PAM-840A          | COM-POWER       | 461314     | 2024.03.15 | 1 year   |
| <input type="checkbox"/>            | HORN ANTENNA      | 3116B             | ETS             | 133350     | 2024.03.22 | 1 year   |
| <input type="checkbox"/>            | HORN ANTENNA      | 3116B             | ETS             | 81109      | 2024.04.25 | 1 year   |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | 3115              | ETS             | 114105     | 2024.04.20 | 1 year   |
| <input checked="" type="checkbox"/> | TEST PROGRAM      | e3 20181212a (V9) | AUDIX           | -          | -          | -        |

## 5- EMISSION

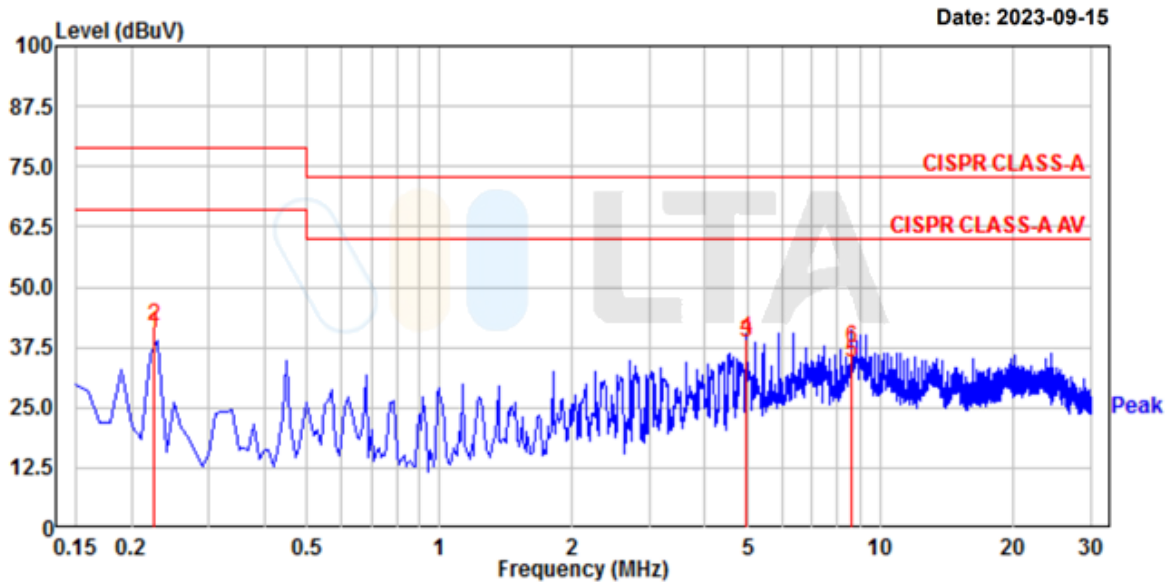
### 5-1 Conducted Emissions

(LINE)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 230831-0146       | Phase         | : LINE             |
| Test Mode    | : Operating         | Test Power    | : AC 120 V / 60 Hz |
| Temp./ Humi. | : 23 'C / 59 % R.H. | Test Engineer | : AHN H Y          |



| No. | Freq<br>MHz | RD<br>QP<br>dBμV | RD<br>AV<br>dBμV | C.F<br>dB | Result<br>QP<br>dBμV | Result<br>AV<br>dBμV | Limit<br>QP<br>dBμV | Limit<br>AV<br>dBμV | Margin<br>QP<br>dB | Margin<br>AV<br>dB | Phase |
|-----|-------------|------------------|------------------|-----------|----------------------|----------------------|---------------------|---------------------|--------------------|--------------------|-------|
| 2.  | 0.226       | 22.45            | 21.11            | 19.42     | 41.87                | 40.53                | 79.00               | 66.00               | 37.13              | 25.47              | Line  |
| 4.  | 4.974       | 19.55            | 18.80            | 19.61     | 39.16                | 38.41                | 73.00               | 60.00               | 33.84              | 21.59              | Line  |
| 6.  | 8.593       | 17.66            | 14.64            | 19.73     | 37.39                | 34.37                | 73.00               | 60.00               | 35.61              | 25.63              | Line  |

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

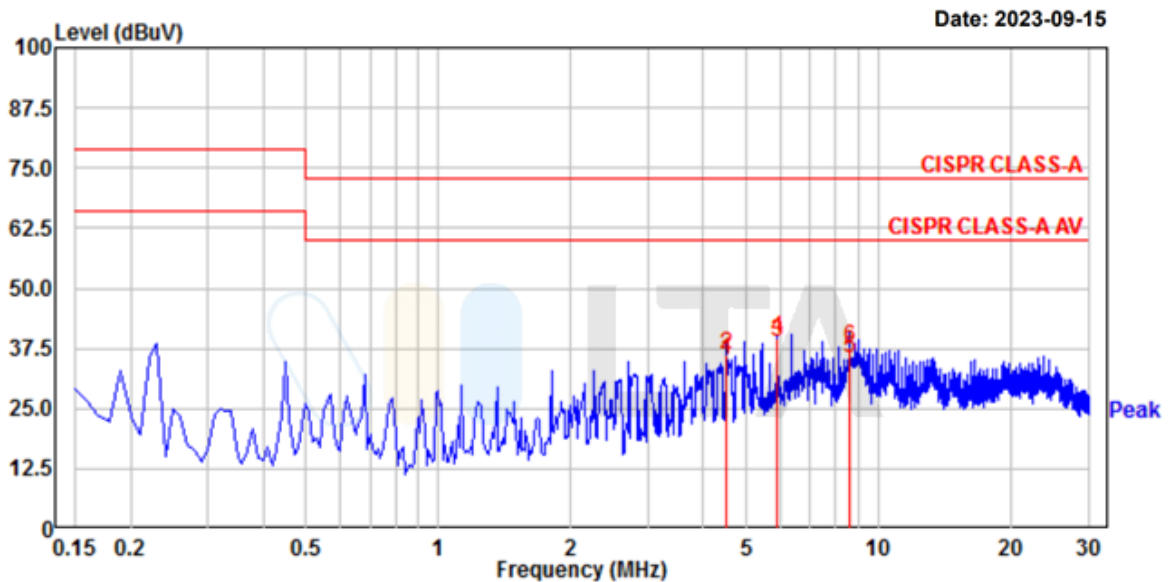


(NEUTRAL)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 230831-0146       | Phase         | : NEUTRAL          |
| Test Mode    | : Operating         | Test Power    | : AC 120 V / 60 Hz |
| Temp./ Humi. | : 23 'C / 59 % R.H. | Test Engineer | : AHN H Y          |



| No. | Freq<br>MHz | RD<br>QP<br>dBuV | RD<br>AV<br>dBuV | C.F<br>dB | Result<br>QP<br>dBuV | Result<br>AV<br>dBuV | Limit<br>QP<br>dBuV | Limit<br>AV<br>dBuV | Margin<br>QP<br>dB | Margin<br>AV<br>dB | Phase   |
|-----|-------------|------------------|------------------|-----------|----------------------|----------------------|---------------------|---------------------|--------------------|--------------------|---------|
| 2.  | 4.522       | 16.48            | 15.49            | 19.60     | 36.08                | 35.09                | 73.00               | 60.00               | 36.92              | 24.91              | neutral |
| 4.  | 5.879       | 20.01            | 19.25            | 19.65     | 39.66                | 38.90                | 73.00               | 60.00               | 33.34              | 21.10              | neutral |
| 6.  | 8.593       | 18.12            | 15.64            | 19.73     | 37.85                | 35.37                | 73.00               | 60.00               | 35.15              | 24.63              | neutral |

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

## 5-2 Radiated Emissions (FCC)

(Below 1 GHz) / H



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Yongin-si, Gyeonggi-do, Korea  
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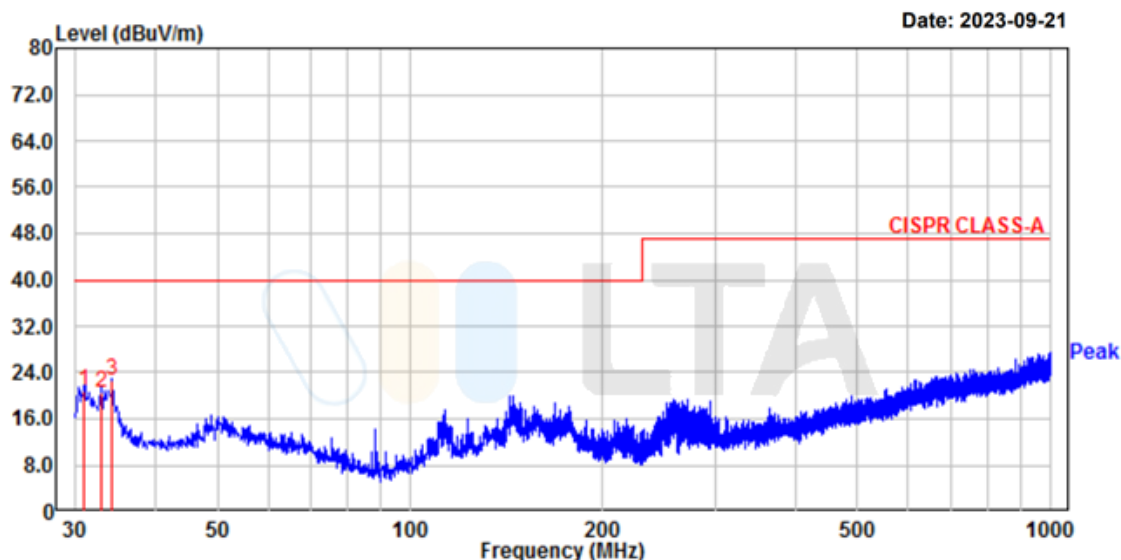
Project No. : 230831-0146

Temp/Humi: 21 'C / 52 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 120 V / 60 Hz



| No. | Freq<br>MHz | Reading<br>dBμV | C.F<br>dB | Result<br>QP<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB | Height<br>cm | Angle<br>deg | Polarity   |
|-----|-------------|-----------------|-----------|------------------------|-----------------|--------------|--------------|--------------|------------|
| 1.  | 30.97       | 34.10           | -13.26    | 20.84                  | 40.00           | 19.16        | 160          | 1            | horizontal |
| 2.  | 32.91       | 33.61           | -13.17    | 20.44                  | 40.00           | 19.56        | 400          | 86           | horizontal |
| 3.  | 34.24       | 35.80           | -13.17    | 22.63                  | 40.00           | 17.37        | 330          | 360          | horizontal |

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

(Below 1 GHz) / V



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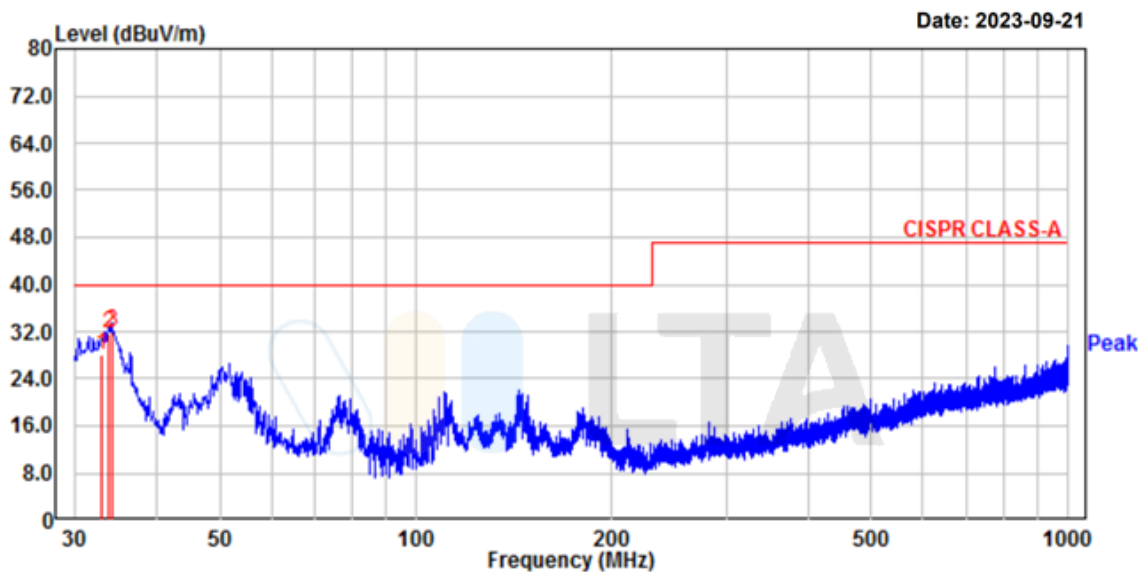
Project No. : 230831-0146

Temp/Humi: 21 'C / 52 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 120 V / 60 Hz



| No. | Freq<br>MHz | Reading<br>dBuV | C.F<br>dB | Result<br>QP<br>dBuV/m | Limit<br>dBuV/m | Margin<br>dB | Height<br>cm | Angle<br>deg | Polarity |
|-----|-------------|-----------------|-----------|------------------------|-----------------|--------------|--------------|--------------|----------|
| 1.  | 32.91       | 41.11           | -13.17    | 27.94                  | 40.00           | 12.06        | 150          | 0            | vertical |
| 2.  | 33.76       | 44.90           | -13.20    | 31.70                  | 40.00           | 8.30         | 100          | 266          | vertical |
| 3.  | 34.12       | 45.20           | -13.20    | 32.00                  | 40.00           | 8.00         | 400          | 358          | vertical |

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

## Radiated Emissions (IC)

(Below 1 GHz) / H



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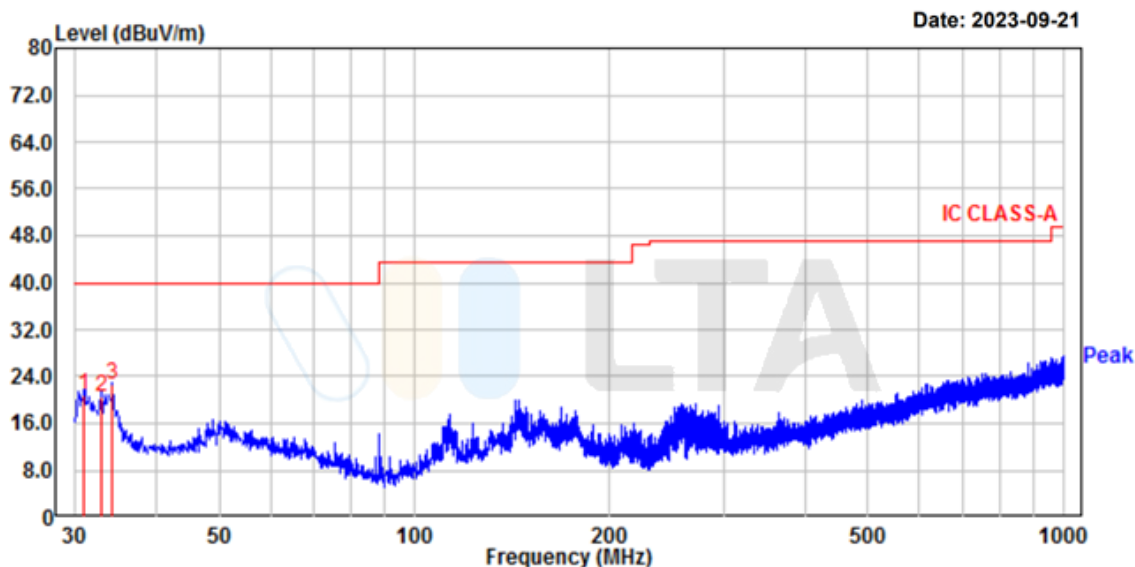
Project No. : 230831-0146

Temp/Humi: 21 'C / 52 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 120 V / 60 Hz



| No. | Freq<br>MHz | Reading<br>dBμV | C.F<br>dB | Result<br>QP<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB | Height<br>cm | Angle<br>deg | Polarity   |
|-----|-------------|-----------------|-----------|------------------------|-----------------|--------------|--------------|--------------|------------|
| 1.  | 30.97       | 34.10           | -13.26    | 20.84                  | 40.00           | 19.16        | 160          | 1            | horizontal |
| 2.  | 32.91       | 33.61           | -13.17    | 20.44                  | 40.00           | 19.56        | 400          | 86           | horizontal |
| 3.  | 34.24       | 35.80           | -13.17    | 22.63                  | 40.00           | 17.37        | 330          | 360          | horizontal |

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

(Below 1 GHz) / V



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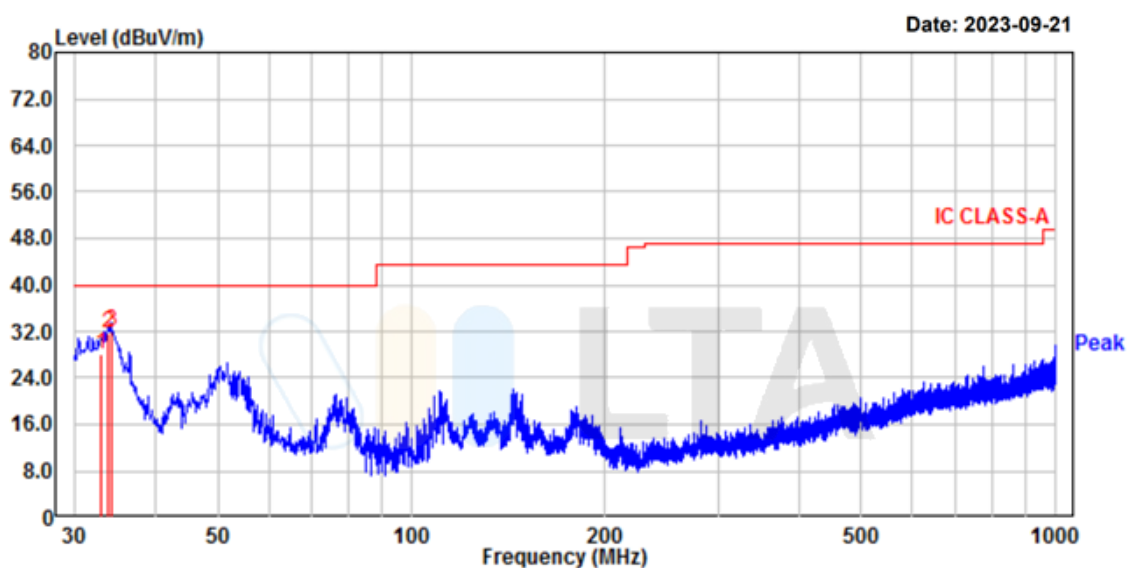
Project No. : 230831-0146

Temp/Humi: 21 'C / 52 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 120 V / 60 Hz



| No. | Freq<br>MHz | Reading<br>dBμV | C.F<br>dB | Result<br>QP<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB | Height<br>cm | Angle<br>deg | Polarity |
|-----|-------------|-----------------|-----------|------------------------|-----------------|--------------|--------------|--------------|----------|
| 1.  | 32.91       | 41.11           | -13.17    | 27.94                  | 40.00           | 12.06        | 150          | 0            | vertical |
| 2.  | 33.76       | 44.90           | -13.20    | 31.70                  | 40.00           | 8.30         | 100          | 266          | vertical |
| 3.  | 34.12       | 45.20           | -13.20    | 32.00                  | 40.00           | 8.00         | 400          | 358          | vertical |

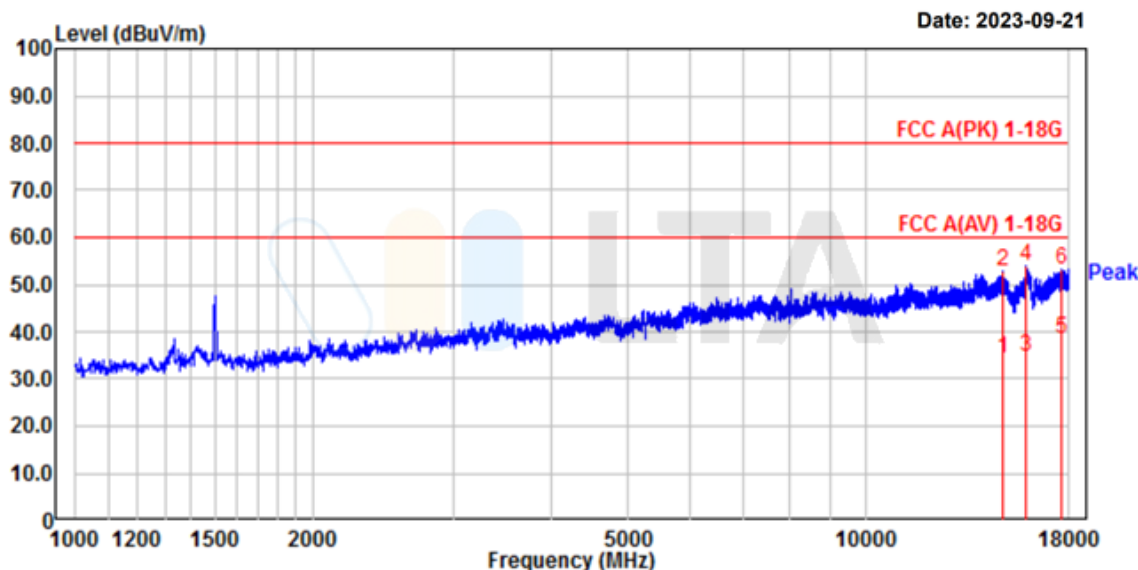
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

# Radiated Emissions (FCC / IC) (Above 1 GHz) / H



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|                           |                              |
|---------------------------|------------------------------|
| Project No. : 230831-0146 | Temp/Humi: 21 'C / 53 % R.H. |
| Test Mode : Operating     | Tested by: AHN H Y           |
| Power : AC 120 V / 60 Hz  | Measure distance : 3.8 m     |



| No. | Freq<br>MHz | RD         |            | C.F   | Result     |            | Limit      |            | Margin   |          | Height | Angle | Polarity   |
|-----|-------------|------------|------------|-------|------------|------------|------------|------------|----------|----------|--------|-------|------------|
|     |             | PK<br>dBuV | AV<br>dBuV |       | PK<br>dBuV | AV<br>dBuV | PK<br>dBuV | AV<br>dBuV | PK<br>dB | AV<br>dB |        |       |            |
| 2.  | 14903.88    | 39.90      | 21.40      | 12.84 | 52.74      | 34.24      | 80.00      | 60.00      | 27.26    | 25.76    | 100    | 16    | horizontal |
| 4.  | 15915.38    | 41.70      | 22.60      | 12.14 | 53.84      | 34.74      | 80.00      | 60.00      | 26.16    | 25.26    | 100    | 0     | horizontal |
| 6.  | 17630.25    | 35.21      | 20.81      | 17.81 | 53.02      | 38.62      | 80.00      | 60.00      | 26.98    | 21.38    | 100    | 69    | horizontal |

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss + Measure distance - Preamp gain

(Above 1 GHz) / V



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Project No. : 230831-0146

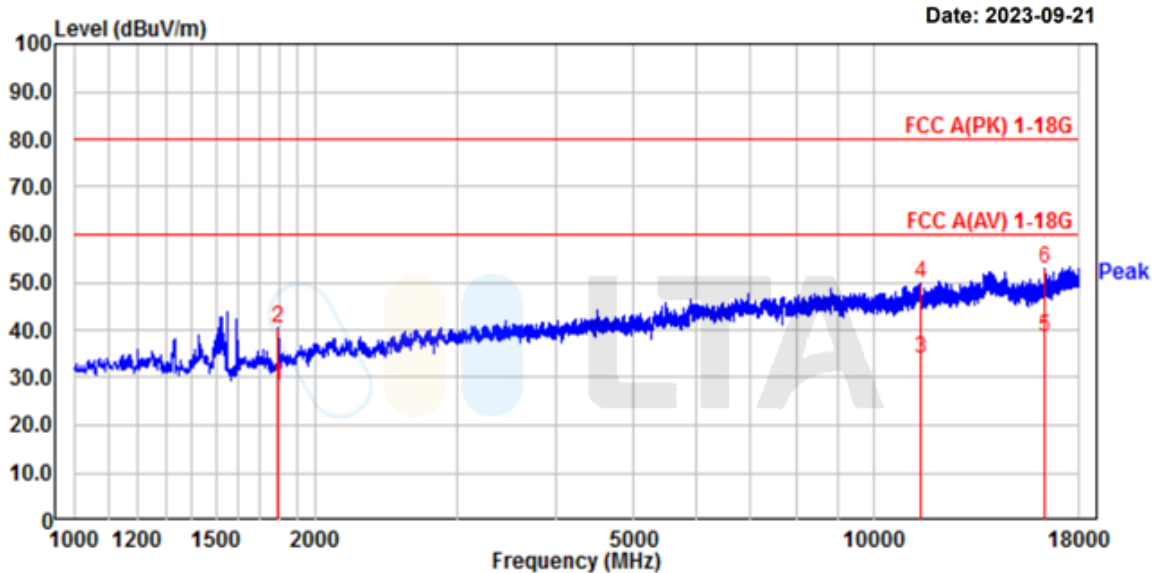
Temp/Humi: 21 'C / 53 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 120 V / 60 Hz

Measure distance : 3.8 m



| No. | Freq<br>MHz | RD         |            | C.F   | Result     |            | Limit      |            | Margin   |          | Height | Angle | Polarity |
|-----|-------------|------------|------------|-------|------------|------------|------------|------------|----------|----------|--------|-------|----------|
|     |             | PK<br>dBμV | AV<br>dBμV |       | PK<br>dBμV | AV<br>dBμV | PK<br>dBμV | AV<br>dBμV | PK<br>dB | AV<br>dB |        |       |          |
| 2.  | 1794.75     | 47.60      | 35.56      | -7.23 | 40.37      | 28.33      | 80.00      | 60.00      | 39.63    | 31.67    | 100    | 313   | vertical |
| 4.  | 11433.75    | 37.51      | 21.90      | 12.22 | 49.73      | 34.12      | 80.00      | 60.00      | 30.27    | 25.88    | 100    | 239   | vertical |
| 6.  | 16370.13    | 39.02      | 24.69      | 13.98 | 53.00      | 38.67      | 80.00      | 60.00      | 27.00    | 21.33    | 100    | 256   | vertical |

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss + Measure distance - Preamp gain



## Conclusions

Product models "**XRN-3220B4**" meets all of the Class A requirements of the FCC Part 15, Subpart B. Limits of radio disturbance characteristics of ITE).

(Refer to Test Specification and Test Results in the "LTA certification", page 4 and 5)

- The highest internal source of an EUT is higher than 108 MHz, the measurement shall be made up to 18 GHz.

(The highest internal source of an EUT : 3.0 GHz)

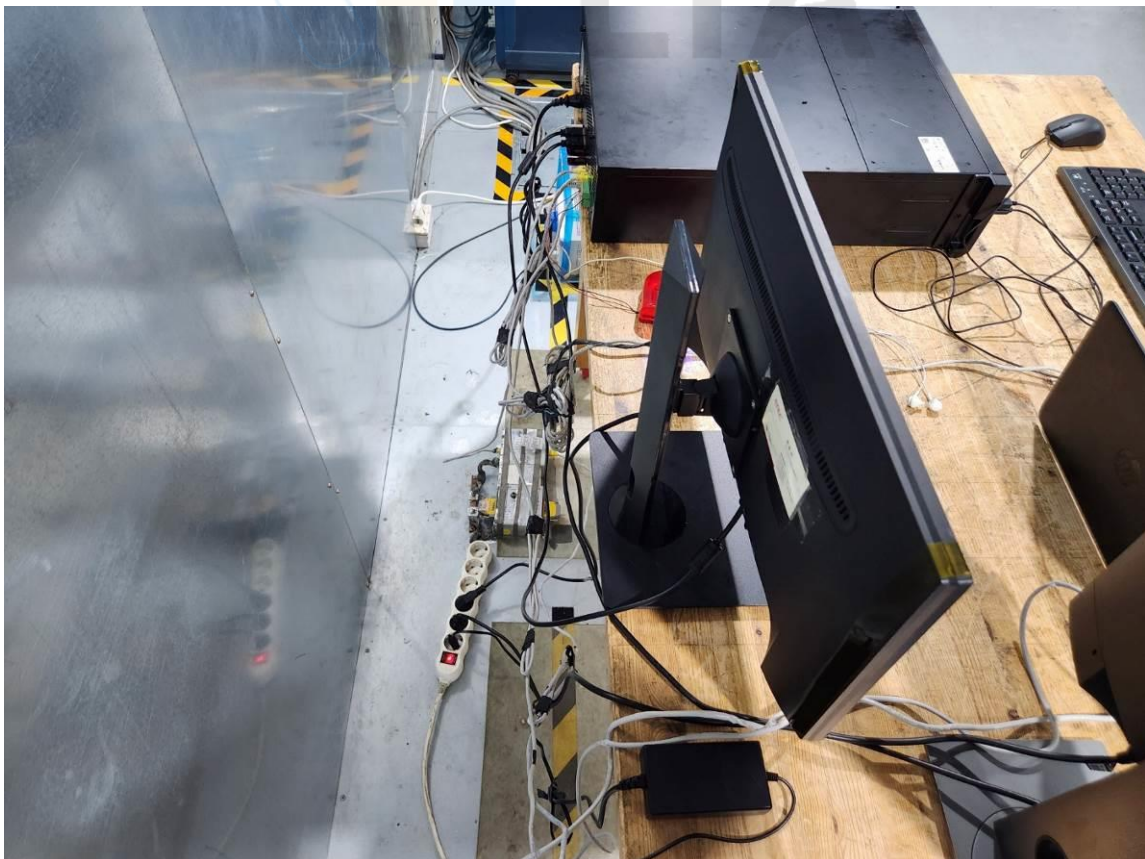




## Photograph of the measurements



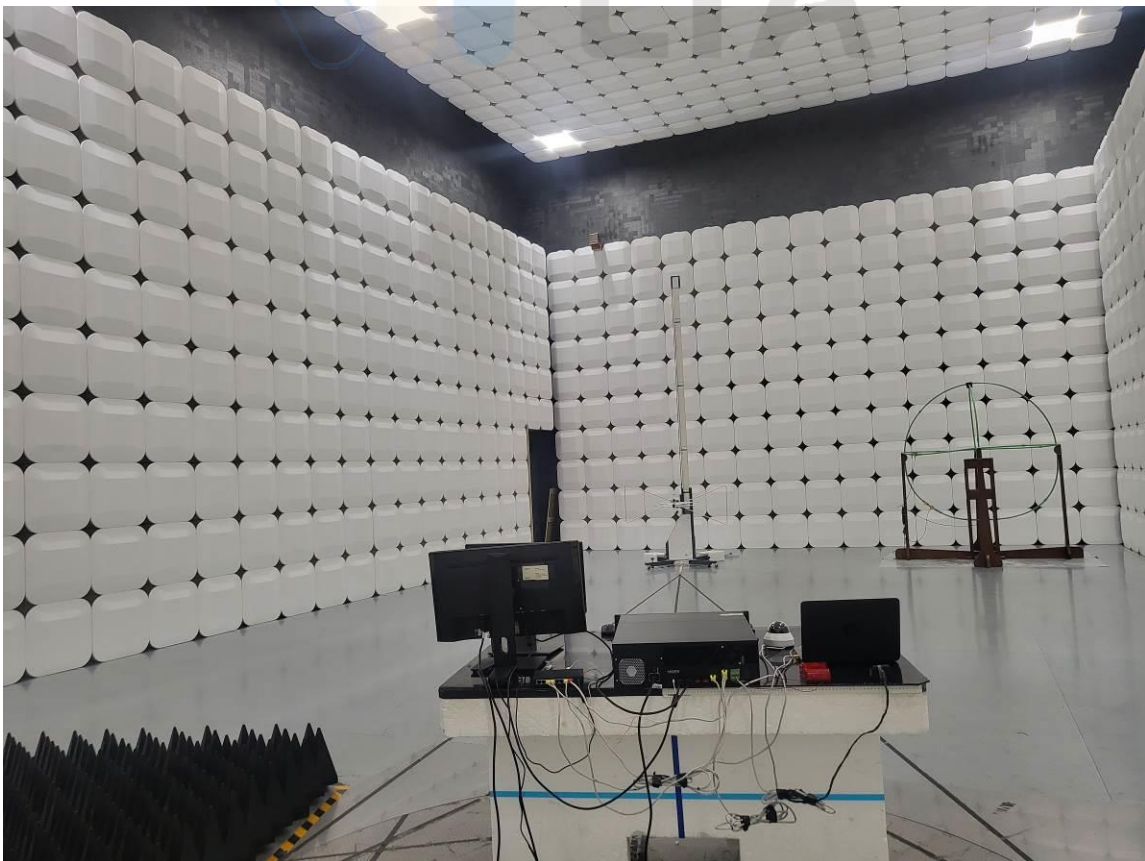
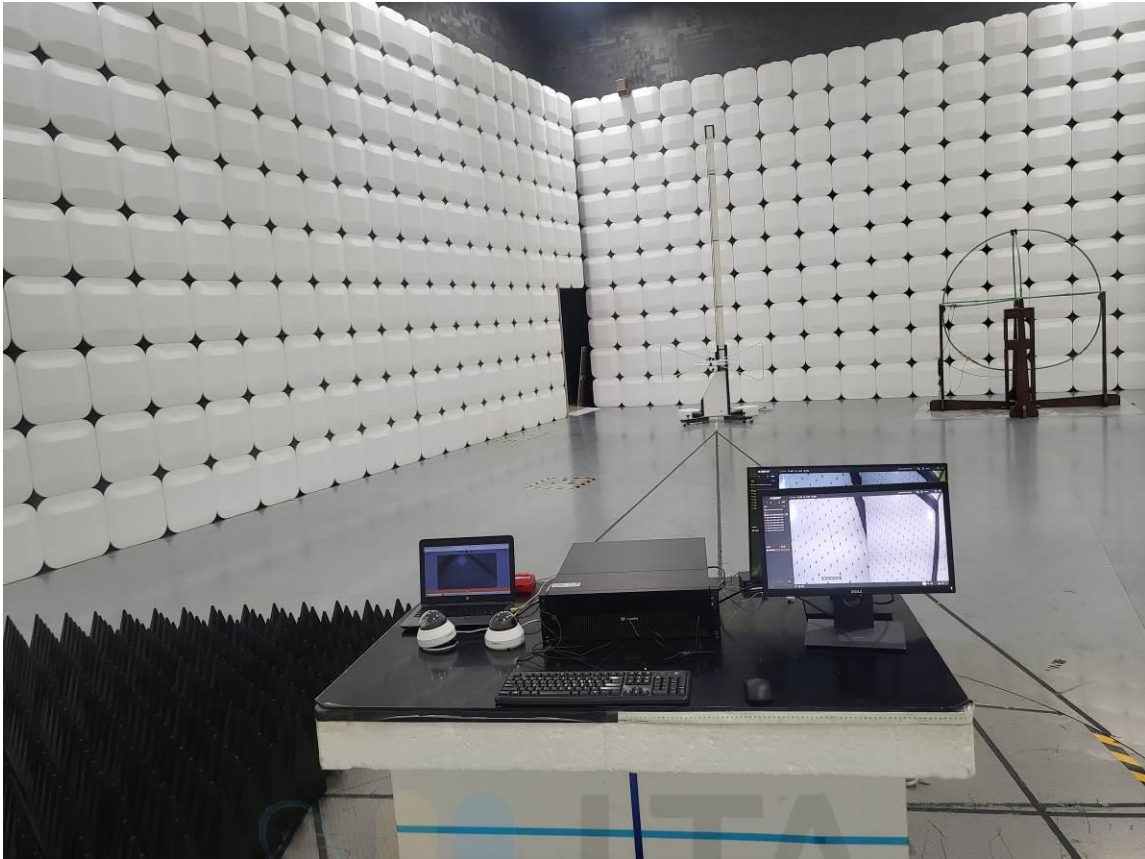
## Conducted Emissions



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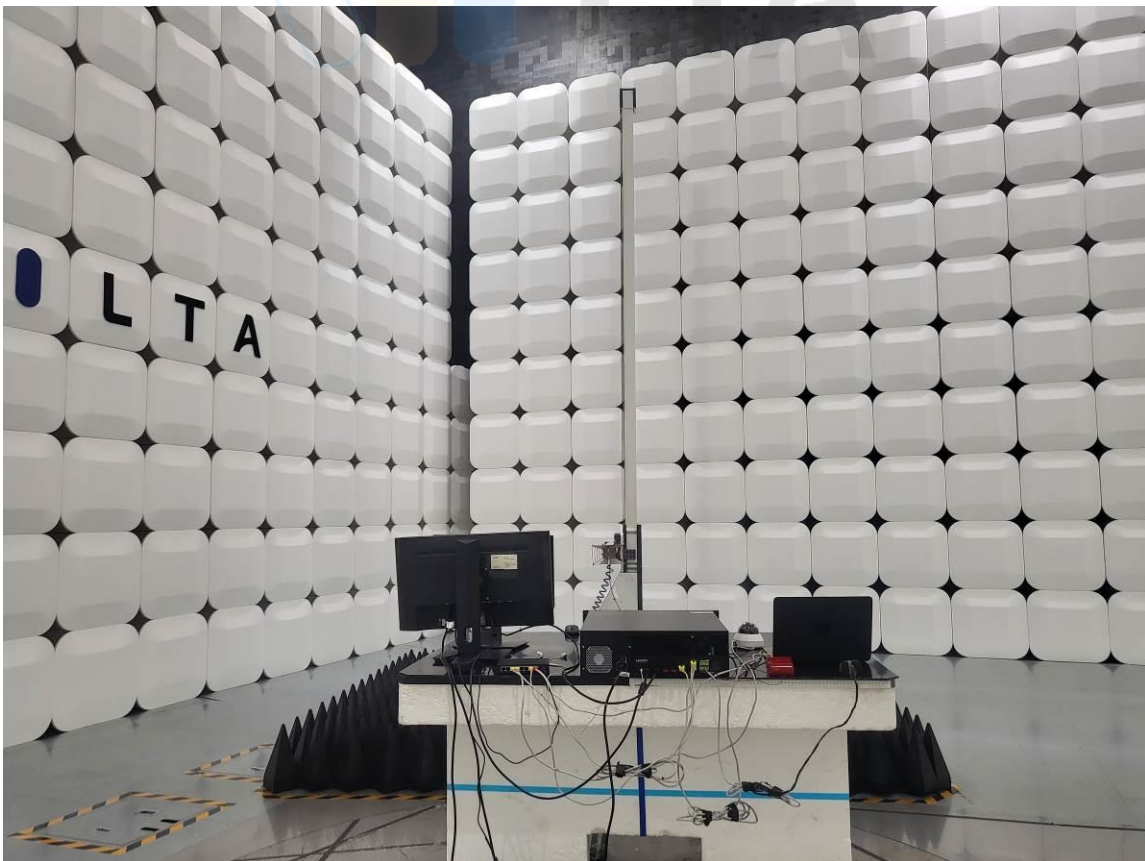
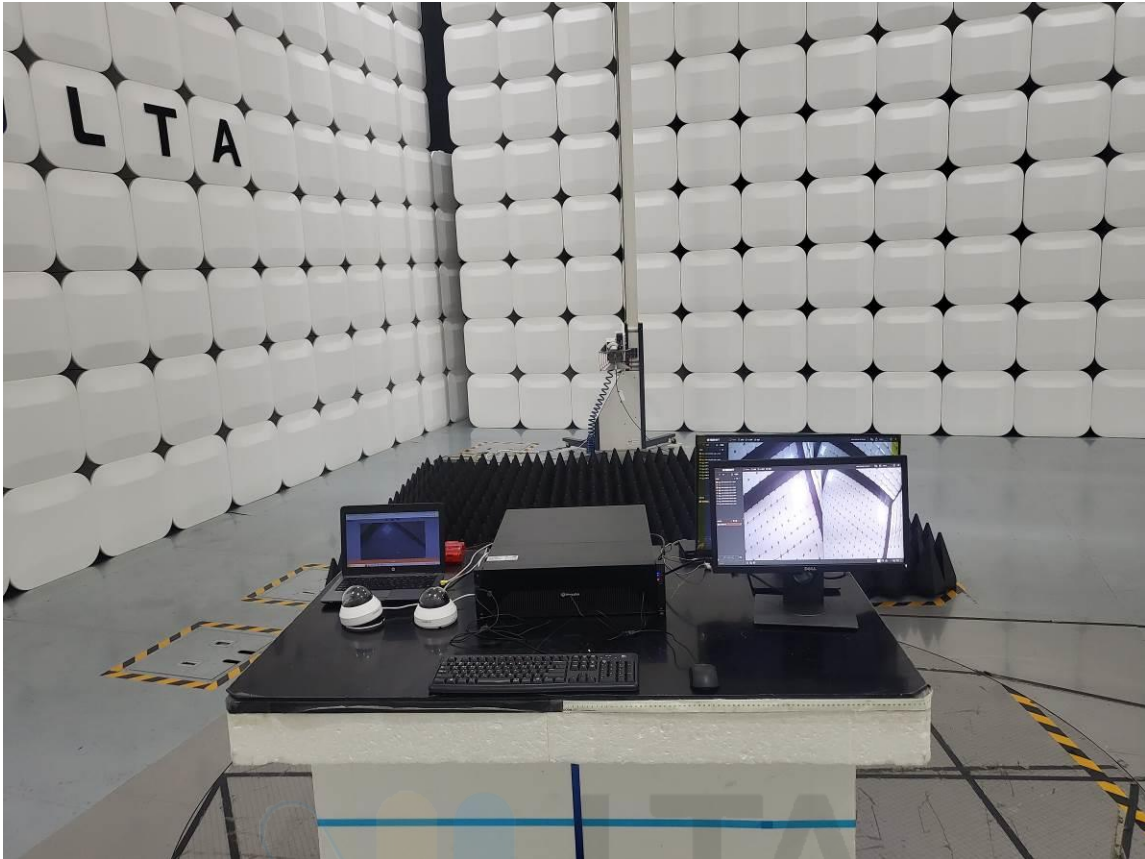
**Radiated Emissions - Below 1 GHz**

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## Radiated Emissions - Above 1 GHz



## Photograph of the EUT

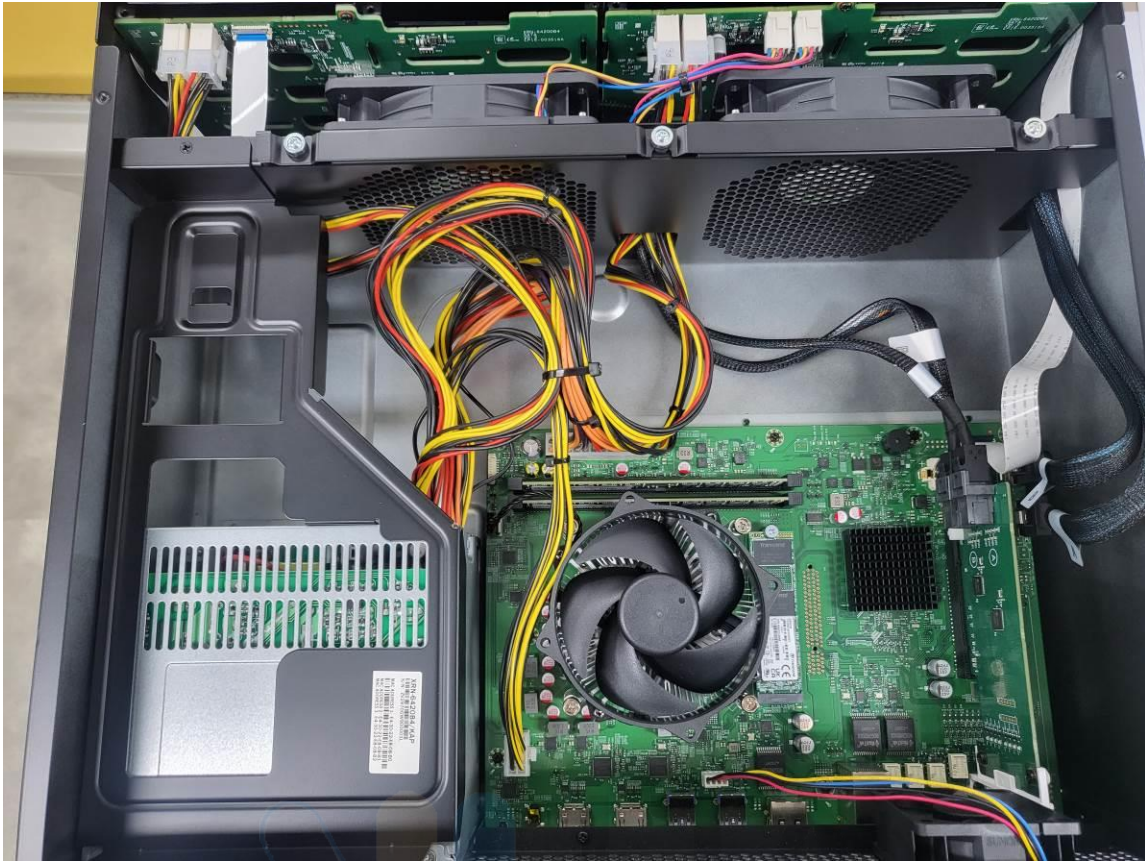


EUT





## EUT



## Modification

