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## EMC TEST REPORT

Dates of Tests: September 15 - 21, 2023

Project No: 230831-0146

Test Site : LTA Co., Ltd.

Model No.

**XRN-3220B4**

APPLICANT

**Hanwha Vision Co., Ltd**

**Equipment Name** : Network Video Recorder  
**Manufacturer** : Hanwha Vision Co., Ltd  
**Model name** : XRN-3220B4  
**Additional Model Name** : -  
**Test Device Serial No.:** Identification  
**Rule Part(s)** : AS/NZS CISPR 32:2015  
CISPR 32 Ed2.0

**Date of issue** : 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

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    | LR500122307AP   | Initial                              |
| 1        | 25.09.2023    | LR500122309C    | Change hardware parts (PCBs and fan) |



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## 1. General information's

### 1-1 Test Performed

Company name : **LTA Co., Ltd**  
 Address : 4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea  
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

### 1-2 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. |

## 2. Information's about test item

### 2-1 Client / Manufacturer

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)

### 2-2 Equipment Under Test (EUT)

Class : A  
 Category : Network Video Recorder  
 Model name : XRN-3220B4  
 Additional Model name : -  
 Serial number : Identification  
 Date of receipt : August 31, 2023  
 EUT condition : Pre-production, not damaged  
 Interface Ports : AC IN, HDMI #1, #2, ALARM IN, ALARM OUT, AUDIO OUT, USB #1 ~ #4, NETWORK #1 ~ #3, Console(Unused)  
 Power rating : AC 240 V, 50 Hz

### 2-3 Modification

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

### 2-4 Test conditions

Temp. / Humid. : (21 - 23) °C / (52 - 59) % R.H.  
 Tested Model : XRN-3220B4  
 Test mode : Operating mode  
 Test Voltage : AC 240 V, 50 Hz

**2-5 List of EUT and ACCESSORY**

| <b>EUT</b>                    |                   |                     |                                                                  |                |
|-------------------------------|-------------------|---------------------|------------------------------------------------------------------|----------------|
| <b>Equipment Name</b>         | <b>Model Name</b> | <b>Serial No.</b>   | <b>Manufacturer</b>                                              | <b>Remarks</b> |
| <b>Network Video Recorder</b> | <b>XRN-3220B4</b> | <b>N/A</b>          | <b>HANWHA VISION VIETNAM COMPANY LIMITED<br/>D-TECH CO.,LTD.</b> | <b>EUT</b>     |
| <b>Mouse</b>                  | <b>MOKJUO</b>     | <b>34O04812</b>     | <b>Primax Electronics Ltd.</b>                                   | <b>EUT</b>     |
| <b>ACCESSORY</b>              |                   |                     |                                                                  |                |
| <b>Equipment Name</b>         | <b>Model Name</b> | <b>Serial No.</b>   | <b>Manufacturer</b>                                              | <b>Remarks</b> |
| NOTEBOOK                      | ELITE BOOK        | N/A                 | HP                                                               | -              |
| MONITOR #1                    | 6230VP            | 73010478A22037<br>1 | Lien Fong(Wujiang) Electronics Co.,Ltd.                          | -              |
| MONITOR #2                    | AM24MB            | N/A                 | ATEC                                                             | -              |
| Keyboard                      | K120              | 1547SC5034U8        | 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         | ZNDJ6V4M9000<br>0CM | HANWHA TECHWIN CO.,LTD.                                          | -              |
| IP Camera #2                  | LND-6022R         | ZNDE6V4M9000<br>0EV | HANWHA TECHWIN CO.,LTD.                                          | -              |

**2-6 Cable List**

| Cable List           |            |                      |               |            |        |
|----------------------|------------|----------------------|---------------|------------|--------|
| From                 |            | To                   |               | Length (m) | Shield |
| 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        | NO     |
| 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     |

3. Test Report

3.1 Summary of tests

| Parameter           | Applied Standard     | Status |
|---------------------|----------------------|--------|
| I. Emission         |                      |        |
| Conducted Emissions | AS/NZS CISPR 32:2015 | C      |
| Radiated Emissions  | AS/NZS CISPR 32:2015 | C      |

Note 1: C=Complies    NC=Not Complies    NT=Not Tested    NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.



## 4. Test Items

### 4-1 Conducted Emissions

#### Definition:

The test assesses the ability of the EUT to limit its internal noise from being present on the AC mains Power In/Output/Telecommunication ports.

We were performed the test according to LTA procedure LTA-QI-04.

|                             |                        |
|-----------------------------|------------------------|
| Test method                 | : AS/NZS CISPR 32:2015 |
| Measurement Frequency range | : 150 kHz - 30 MHz     |
| Measurement RBW             | : 9 kHz                |
| Test Location               | : Shielded Room        |
| Test mode                   | : Operating mode       |
| Result                      | : <b>Complies</b>      |

#### Measurement Data:

- Refer to the Next page (Maximum emission configuration)

#### A sample calculation:

COR. F (correction factor)= LISN Insertion loss + Cable loss + Pulse Limiter Factor

Emission Level= meter reading + COR.F

#### Limits for conducted disturbance at the mains ports of class A ITE

| Frequency Range  | Quasi-peak    | Average       |
|------------------|---------------|---------------|
| (0.15 - 0.5) MHz | 79 dB $\mu$ V | 66 dB $\mu$ V |
| (0.5 – 30) MHz   | 73 dB $\mu$ V | 60 dB $\mu$ V |

Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz

#### Limits for conducted disturbance at the mains ports of class B ITE

| Frequency Range  | Quasi-peak           | Average              |
|------------------|----------------------|----------------------|
| (0.15 – 0.5) MHz | (66 – 56) dB $\mu$ V | (56 - 46) dB $\mu$ V |
| (0.5 – 5) MHz    | 56 dB $\mu$ V        | 46 dB $\mu$ V        |
| (5 – 30) MHz     | 60 dB $\mu$ V        | 50 dB $\mu$ V        |

Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz

**Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class A equipment**

| Frequency Range  | Voltage limits       |                      | Current limits       |                      |
|------------------|----------------------|----------------------|----------------------|----------------------|
|                  | Quasi-peak           | Average              | Quasi-peak           | Average              |
| (0.15 - 0.5) MHz | (97 – 87) dB $\mu$ V | (84 – 74) dB $\mu$ V | (53 – 43) dB $\mu$ V | (40 – 30) dB $\mu$ V |
| (0.5 – 30) MHz   | 87 dB $\mu$ V        | 74 dB $\mu$ V        | 43 dB $\mu$ V        | 30 dB $\mu$ V        |

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150  $\Omega$  to the telecommunication port under test (conversion factor is  $20 \log_{10} 150/I = 44$  dB)

**Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class B equipment**

| Frequency Range  | Voltage limits       |                      | Current limits       |                      |
|------------------|----------------------|----------------------|----------------------|----------------------|
|                  | Quasi-peak           | Average              | Quasi-peak           | Average              |
| (0.15 - 0.5) MHz | (84 – 74) dB $\mu$ V | (74 – 64) dB $\mu$ V | (40 – 30) dB $\mu$ V | (30 – 20) dB $\mu$ V |
| (0.5 – 30) MHz   | 74 dB $\mu$ V        | 64 dB $\mu$ V        | 30 dB $\mu$ V        | 20 dB $\mu$ V        |

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

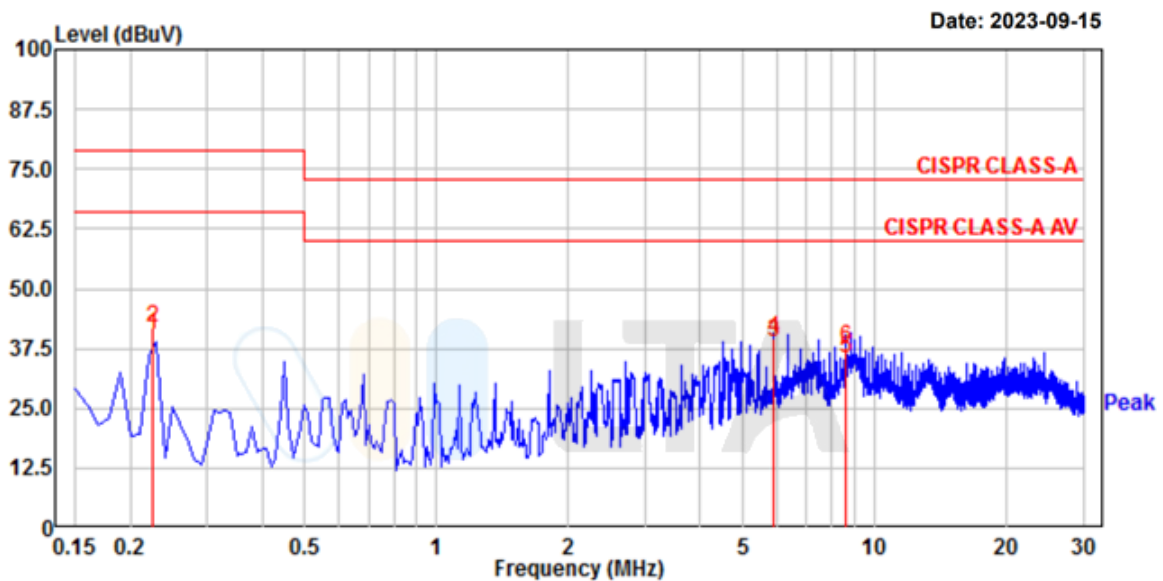
Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150  $\Omega$  to the telecommunication port under test (conversion factor is  $20 \log_{10} 150/I = 44$  dB)

## Conducted Emissions (LINE)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 230831-0146       | Phase         | : LINE             |
| Test Mode    | : Operating         | Test Power    | : AC 240 V / 50 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       | 22.43            | 21.13            | 19.42     | 41.85                | 40.55                | 79.00               | 66.00               | 37.15              | 25.45              | Line  |
| 4.  | 5.879       | 20.01            | 19.11            | 19.65     | 39.66                | 38.76                | 73.00               | 60.00               | 33.34              | 21.24              | Line  |
| 6.  | 8.592       | 18.06            | 15.57            | 19.73     | 37.79                | 35.30                | 73.00               | 60.00               | 35.21              | 24.70              | Line  |

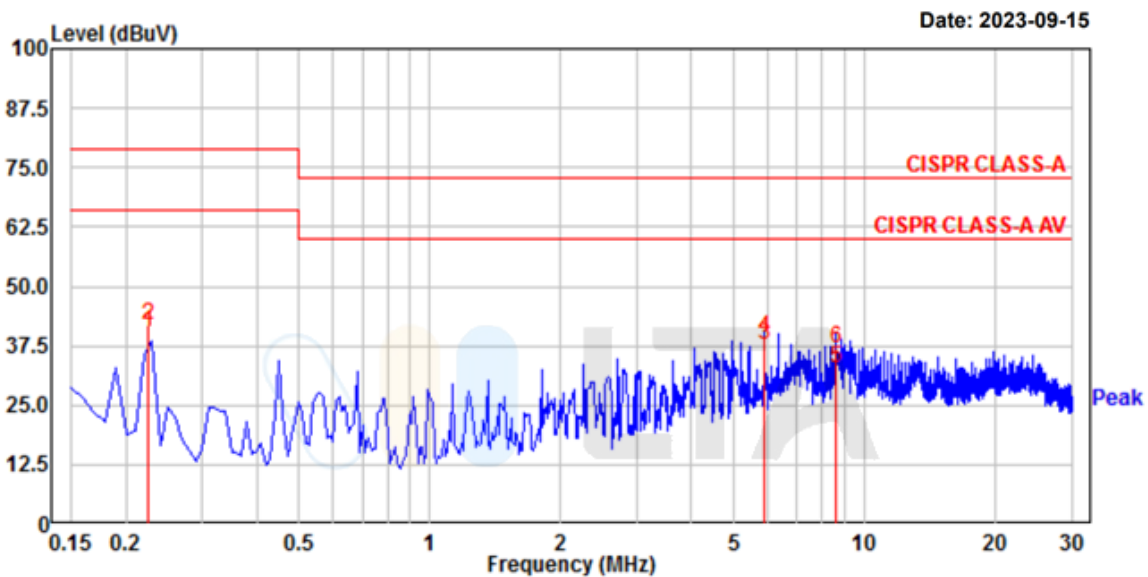
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

## Conducted Emissions (NEUTRAL)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 230831-0146       | Phase         | : NEUTRAL          |
| Test Mode    | : Operating         | Test Power    | : AC 240 V / 50 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       | 22.44            | 21.12            | 19.42     | 41.86                | 40.54                | 79.00               | 66.00               | 37.14              | 25.46              | neutral |
| 4.  | 5.880       | 19.52            | 18.25            | 19.65     | 39.17                | 37.90                | 73.00               | 60.00               | 33.83              | 22.10              | neutral |
| 6.  | 8.595       | 17.13            | 13.22            | 19.73     | 36.86                | 32.95                | 73.00               | 60.00               | 36.14              | 27.05              | neutral |

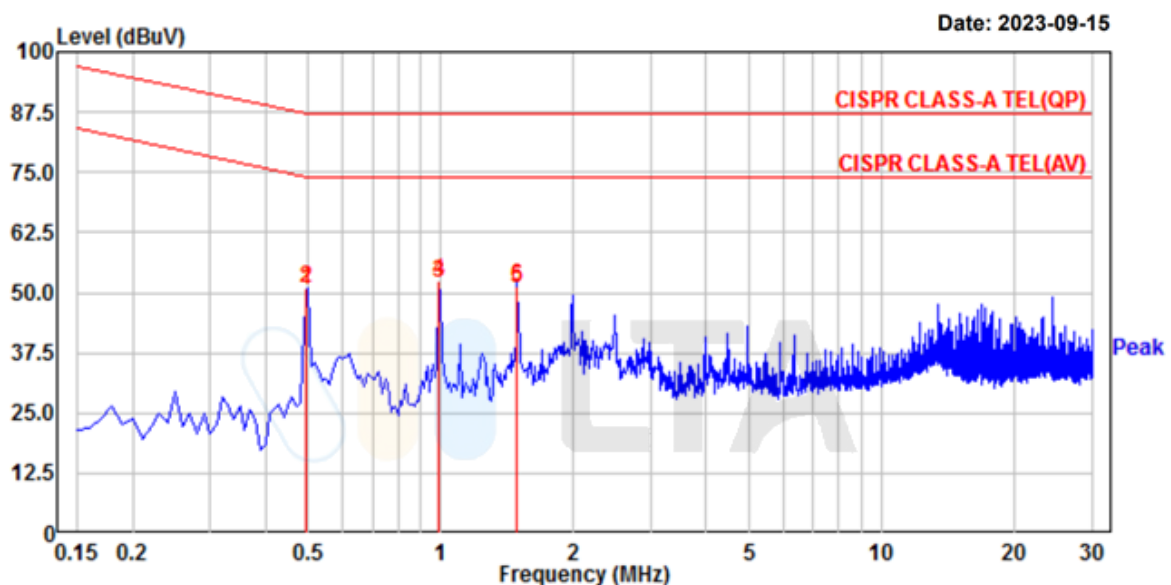
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

## Conducted Emissions (TEL\_1000 M #1)



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|              |                     |               |                      |
|--------------|---------------------|---------------|----------------------|
| Project No.  | : 230831-0146       | Phase         | : TEL_1000M (LAN #1) |
| Test Mode    | : Operating         | Test Power    | : AC 240 V / 50 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.  | 0.496       | 31.73            | 31.42            | 19.32     | 51.05                | 50.74                | 87.06               | 74.06               | 36.01              | 23.32              | Line  |
| 4.  | 0.993       | 33.02            | 32.69            | 19.26     | 52.28                | 51.95                | 87.00               | 74.00               | 34.72              | 22.05              | Line  |
| 6.  | 1.490       | 32.17            | 31.62            | 19.23     | 51.40                | 50.85                | 87.00               | 74.00               | 35.60              | 23.15              | Line  |

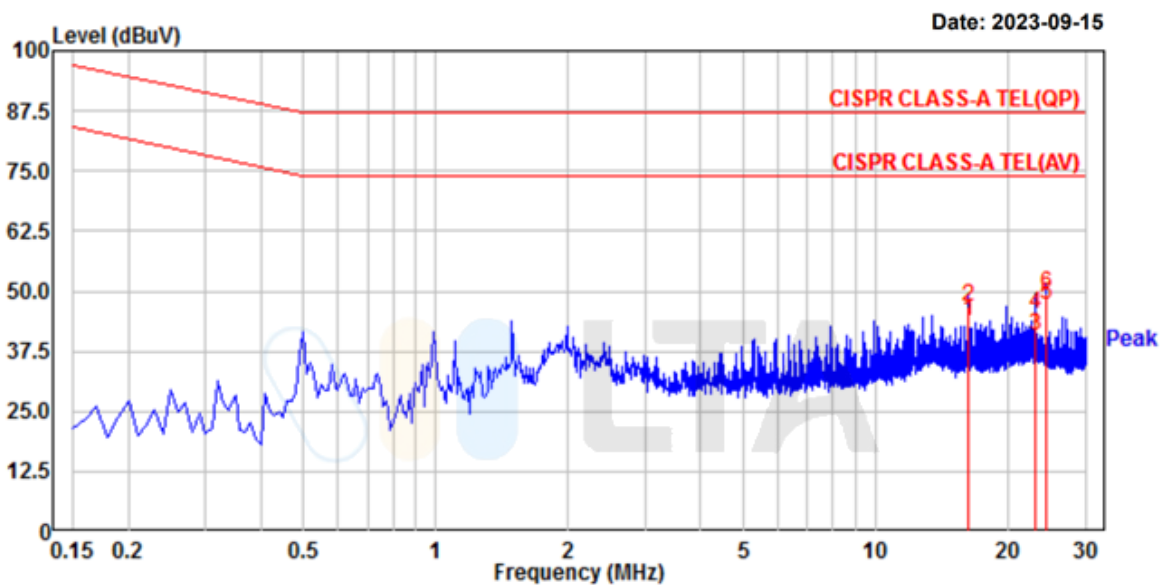
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

## Conducted Emissions (TEL\_1000 M #2)



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|              |                     |               |                      |
|--------------|---------------------|---------------|----------------------|
| Project No.  | : 230831-0146       | Phase         | : TEL_1000M (LAN #2) |
| Test Mode    | : Operating         | Test Power    | : AC 240 V / 50 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.  | 16.228      | 27.23            | 24.35            | 19.54     | 46.77                | 43.89                | 87.00               | 74.00               | 40.23              | 30.11              | Line  |
| 4.  | 23.127      | 25.45            | 21.02            | 19.66     | 45.11                | 40.68                | 87.00               | 74.00               | 41.89              | 33.32              | Line  |
| 6.  | 24.349      | 29.58            | 27.45            | 19.69     | 49.27                | 47.14                | 87.00               | 74.00               | 37.73              | 26.86              | Line  |

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

## 4-2 Radiated Emissions

### Definition:

The test assesses the ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

We were performed the test according to LTA procedure LTA-QI-04.

|                             |                                      |
|-----------------------------|--------------------------------------|
| Test method                 | : AS/NZS CISPR 32:2015               |
| Measuring Distance          | : 10 m below 1 GHz / 3 m above 1 GHz |
| Measurement Frequency range | : 30 MHz – 6 000 MHz                 |
| Measurement RBW             | : 120 kHz @ 10 m / 1 MHz @ 3 m       |
| Test Location               | : 10 m Chamber                       |
| Test mode                   | : Operating mode                     |
| Result                      | : <b>Complies</b>                    |

### Measurement Data:

- Refer to the Next page (Maximum emission configuration)
- The highest internal source of an EUT is higher than 108 MHz, the measurement shall only be made up to 6 GHz.

### A sample calculation:

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

Emission Level= meter reading + COR.F

**Limit of 10 m below 1 GHz**

## CLASS A

| Frequency Range   | Quasi-peak      |
|-------------------|-----------------|
| (30 – 230) MHz    | 40 dB $\mu$ V/m |
| (230 – 1 000) MHz | 47 dB $\mu$ V/m |

## CLASS B

| Frequency Range   | Quasi-peak      |
|-------------------|-----------------|
| (30 – 230) MHz    | 30 dB $\mu$ V/m |
| (230 – 1 000) MHz | 37 dB $\mu$ V/m |

**Limit of 3m above 1 GHz**

## CLASS A

| Frequency Range     | Average Limit @ 3m<br>(dB $\mu$ V/m) | Peak limit @ 3m<br>(dB $\mu$ V/m) |
|---------------------|--------------------------------------|-----------------------------------|
| (1 000 – 3 000) MHz | 56                                   | 76                                |
| (3 000 – 6 000) MHz | 60                                   | 80                                |

NOTE: The lower limit applies at the transition frequency.

## CLASS B

| Frequency Range     | Average Limit @ 3m<br>(dB $\mu$ V/m) | Peak limit @ 3m<br>(dB $\mu$ V/m) |
|---------------------|--------------------------------------|-----------------------------------|
| (1 000 – 3 000) MHz | 50                                   | 70                                |
| (3 000 – 6 000) MHz | 54                                   | 74                                |

NOTE: The lower limit applies at the transition frequency.

## Radiated Emissions (Below 1 GHz) / H



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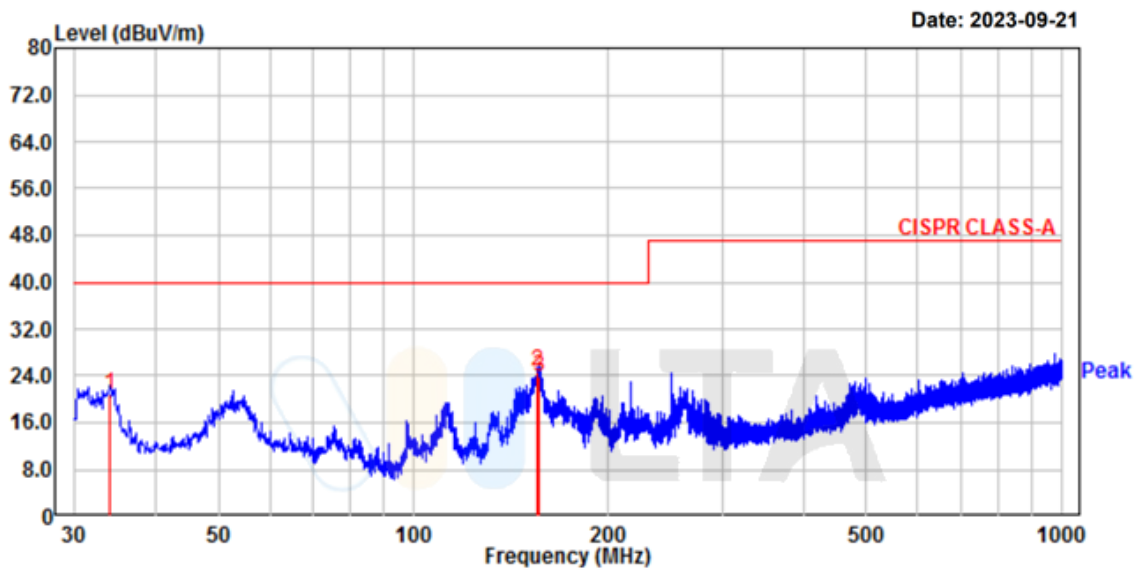
Project No. : 230831-0146

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

Test Mode : Operating

Tested by: AHN H Y

Power : AC 240 V / 50 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.  | 33.88       | 34.10           | -13.21    | 20.89                  | 40.00           | 19.11        | 160          | 250          | horizontal |
| 2.  | 155.13      | 35.60           | -10.87    | 24.73                  | 40.00           | 15.27        | 400          | 176          | horizontal |
| 3.  | 156.34      | 34.80           | -10.95    | 23.85                  | 40.00           | 16.15        | 310          | 53           | horizontal |

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

## Radiated Emissions (Below 1 GHz) / V



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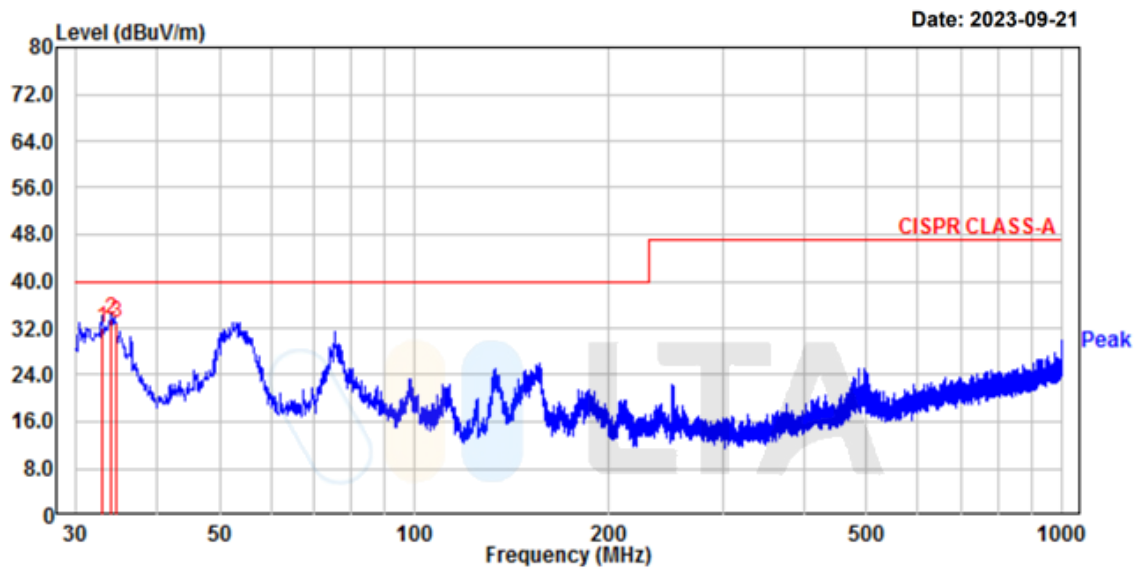
Project No. : 230831-0146

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

Test Mode : Operating

Tested by: AHN H Y

Power : AC 240 V / 50 Hz



| No. | Freq<br>MHz | Reading<br>dB $\mu$ V | C.F<br>dB | Result<br>QP<br>dB $\mu$ V/m | Limit<br>dB $\mu$ V/m | Margin<br>dB | Height<br>cm | Angle<br>deg | Polarity |
|-----|-------------|-----------------------|-----------|------------------------------|-----------------------|--------------|--------------|--------------|----------|
| 1.  | 32.91       | 45.11                 | -13.17    | 31.94                        | 40.00                 | 8.06         | 100          | 38           | vertical |
| 2.  | 34.00       | 46.80                 | -13.22    | 33.58                        | 40.00                 | 6.42         | 400          | 319          | vertical |
| 3.  | 34.61       | 45.90                 | -13.09    | 32.81                        | 40.00                 | 7.19         | 320          | 360          | vertical |

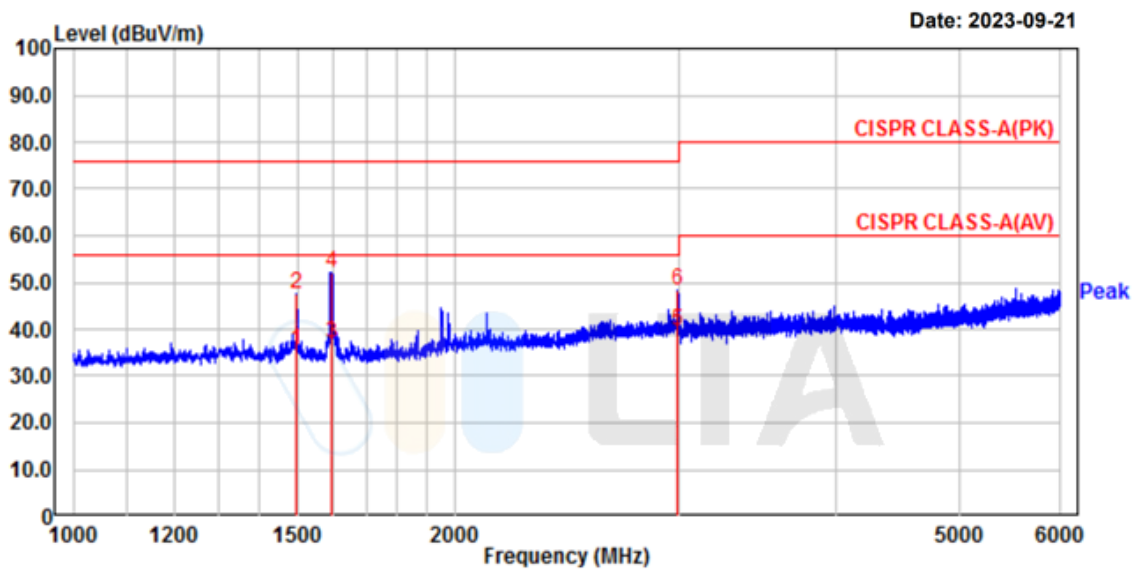
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

## Radiated Emissions (Above 1 GHz) / H



4, Songjuro 236Beon-gil, yanggi-myeon,  
Yongin-si, Gyeonggi-do, Korea  
Tel : +82-31-3236008,9  
Fax : +82-31-3236010  
www.ltalab.com

Project No. : 230831-0146 Temp/Humi: 21 'C / 52 % R.H.  
Test Mode : Operating Tested by: AHN H Y  
Power : AC 240 V / 50 Hz Measure distance : 3.8 m



| No. | Freq    | RD    | RD    | C.F   | Result | Result | Limit | Limit | Margin | Margin | Height | Angle | Polarity   |
|-----|---------|-------|-------|-------|--------|--------|-------|-------|--------|--------|--------|-------|------------|
|     | MHz     | PK    | AV    | dB    | PK     | AV     | PK    | AV    | PK     | AV     | cm     | deg   |            |
| 2.  | 1497.50 | 50.47 | 38.49 | -2.97 | 47.50  | 35.52  | 76.00 | 56.00 | 28.50  | 20.48  | 100    | 275   | horizontal |
| 4.  | 1597.50 | 54.99 | 39.80 | -2.92 | 52.07  | 36.88  | 76.00 | 56.00 | 23.93  | 19.12  | 100    | 292   | horizontal |
| 6.  | 2994.38 | 42.00 | 33.09 | 6.40  | 48.40  | 39.49  | 76.00 | 56.00 | 27.60  | 16.51  | 100    | 252   | horizontal |

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

Radiated Emissions (Above 1 GHz) / V



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Project No. : 230831-0146

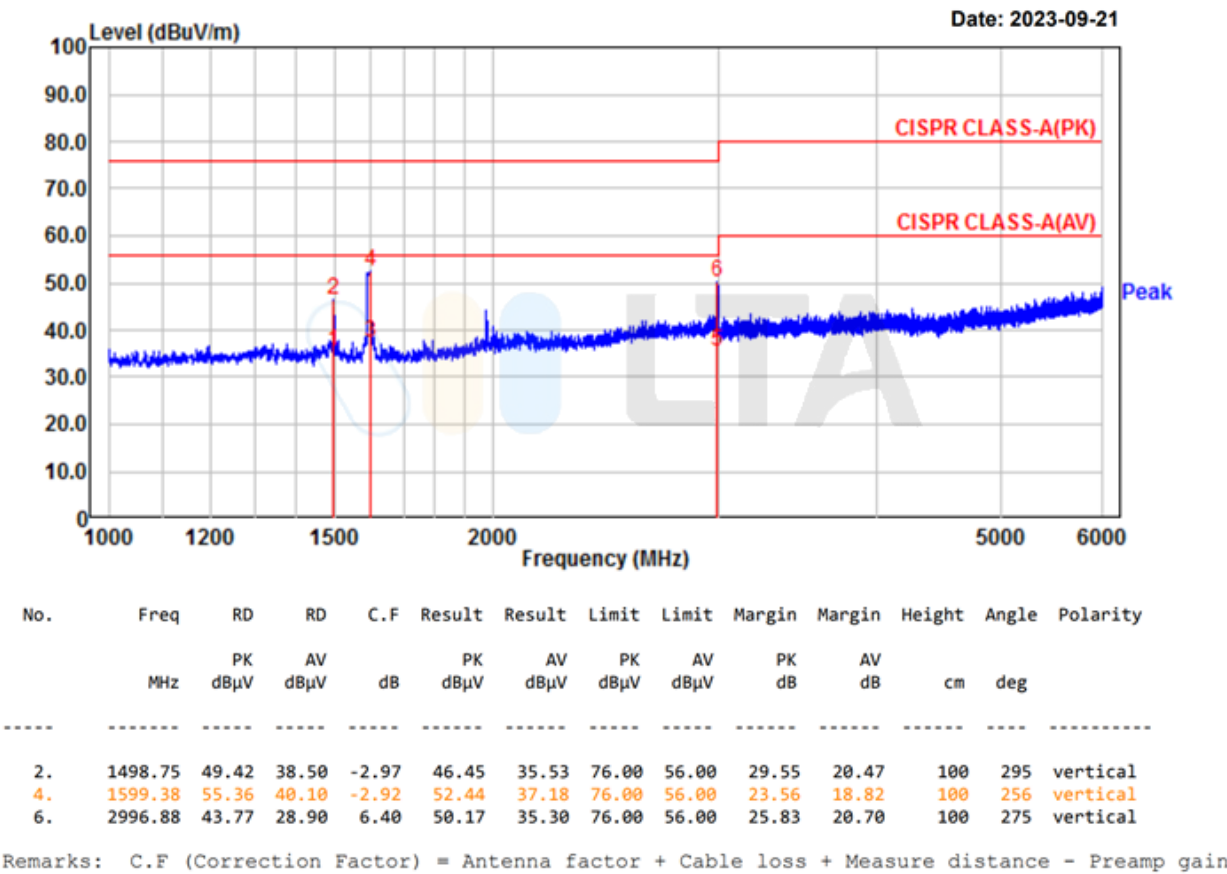
Temp/Humi: 21 'C / 52 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 240 V / 50 Hz

Measure distance : 3.8 m



## **APPENDIX A**

### **TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**



To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment are identified by the Test Laboratory.

**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"/>            | ISN               | ISN T800             | TESEQ           | 27109       | 2024.08.17 | 1 year   |
| <input checked="" type="checkbox"/> | ISN               | ENY81-CA6            | Rohde & Schwarz | 101565      | 2024.08.17 | 1 year   |
| <input type="checkbox"/>            | ISN               | ISN S8               | Schwarzbeck     | 79          | 2024.08.17 | 1 year   |
| <input type="checkbox"/>            | CURRENT PROBE     | EZ-17                | Rohde & Schwarz | 100508      | 2024.08.23 | 1 year   |
| <input type="checkbox"/>            | CDN               | TSCDN-C1-BNC-75      | F.C.C           | 07004       | 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 | 2 year   |
| <input type="checkbox"/>            | HORN ANTENNA      | 3116B             | ETS             | 81109      | 2024.04.25 | 2 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           | -          | -          | -        |

## **APPENDIX B**

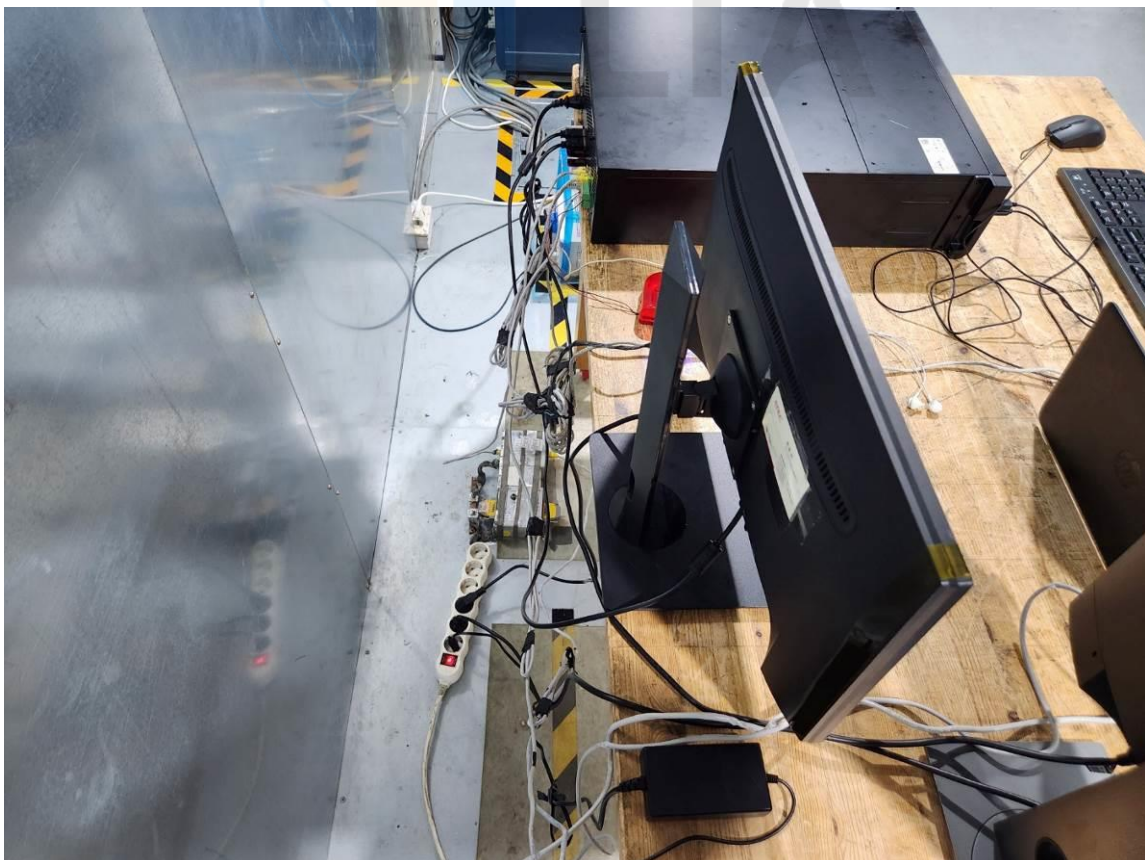
### **PHOTOGRAPHS**



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## Conducted Emissions

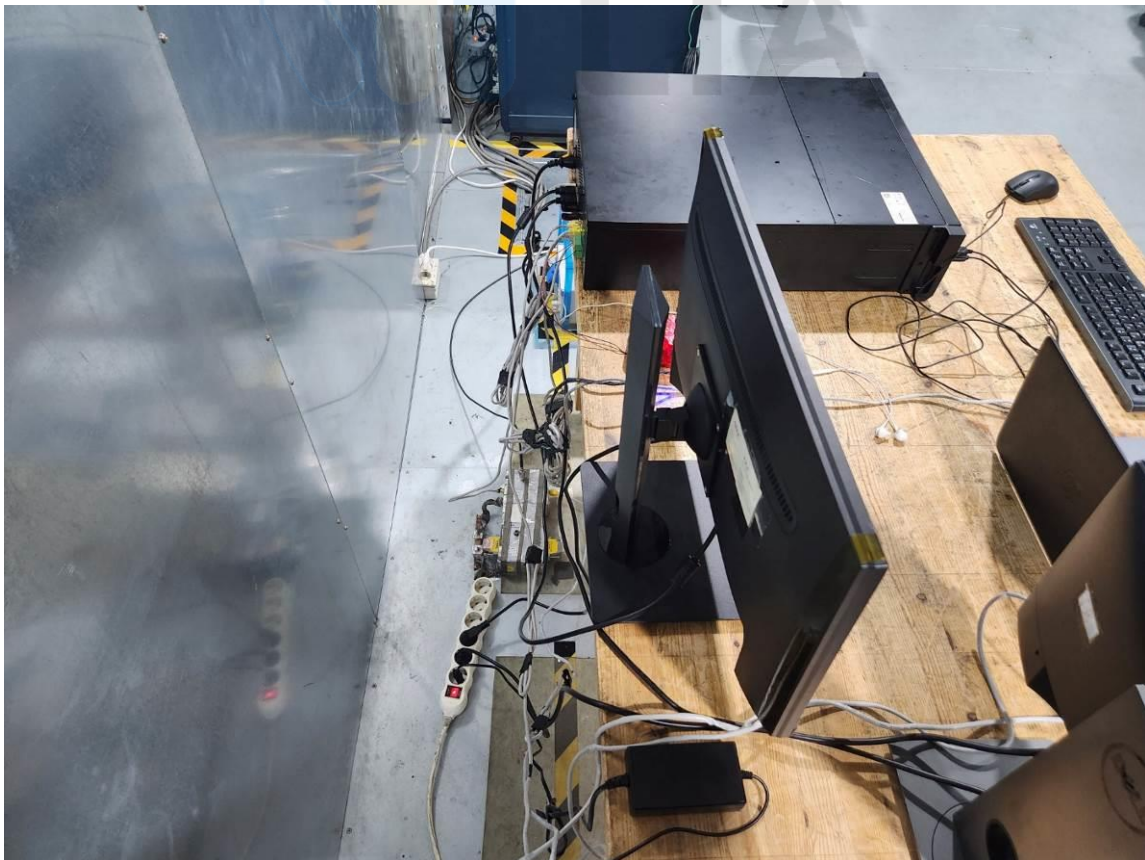
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## Conducted Emissions (TEL)

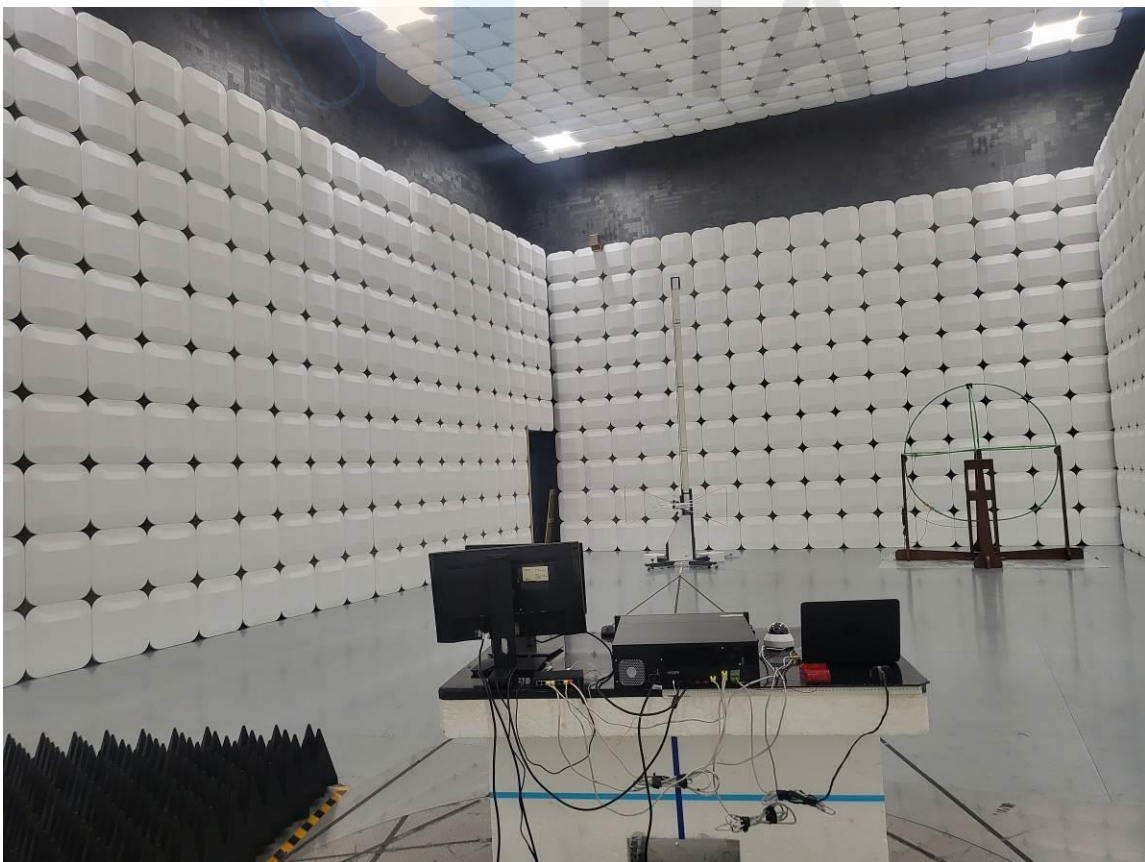
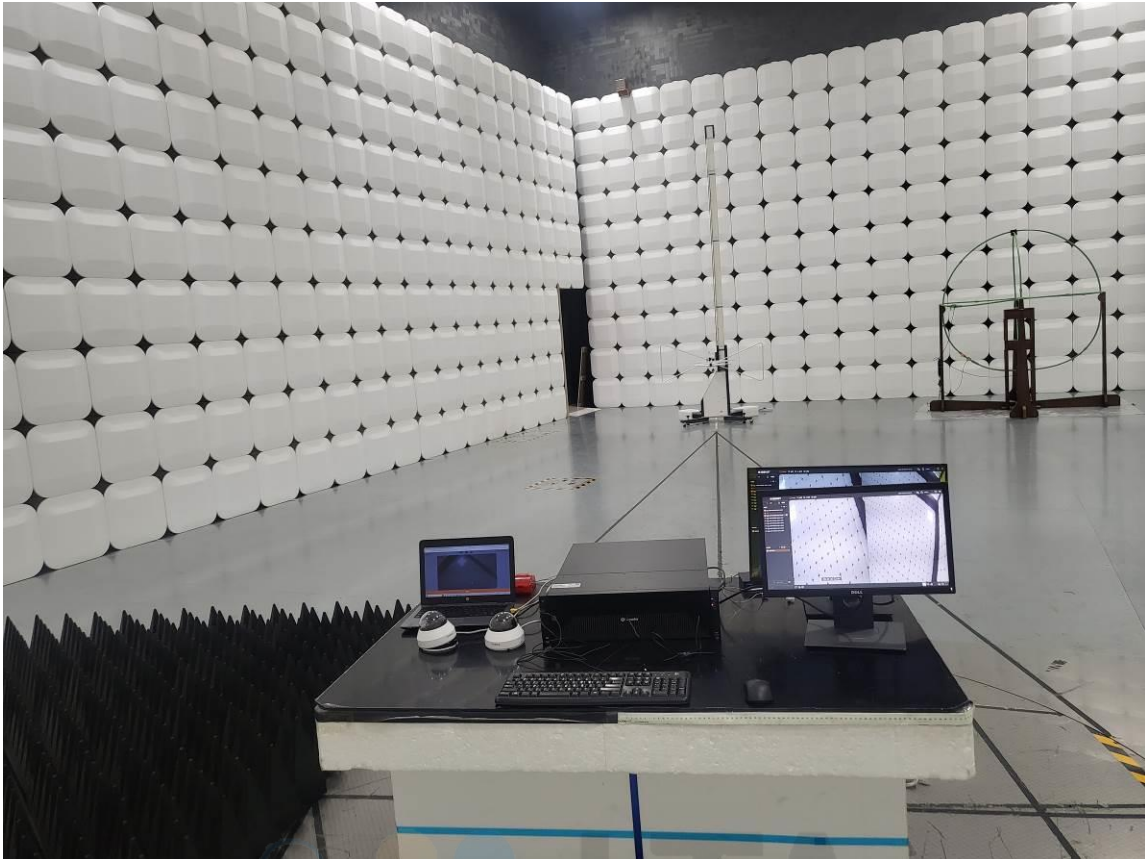
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## Radiated Emissions - Below 1 GHz

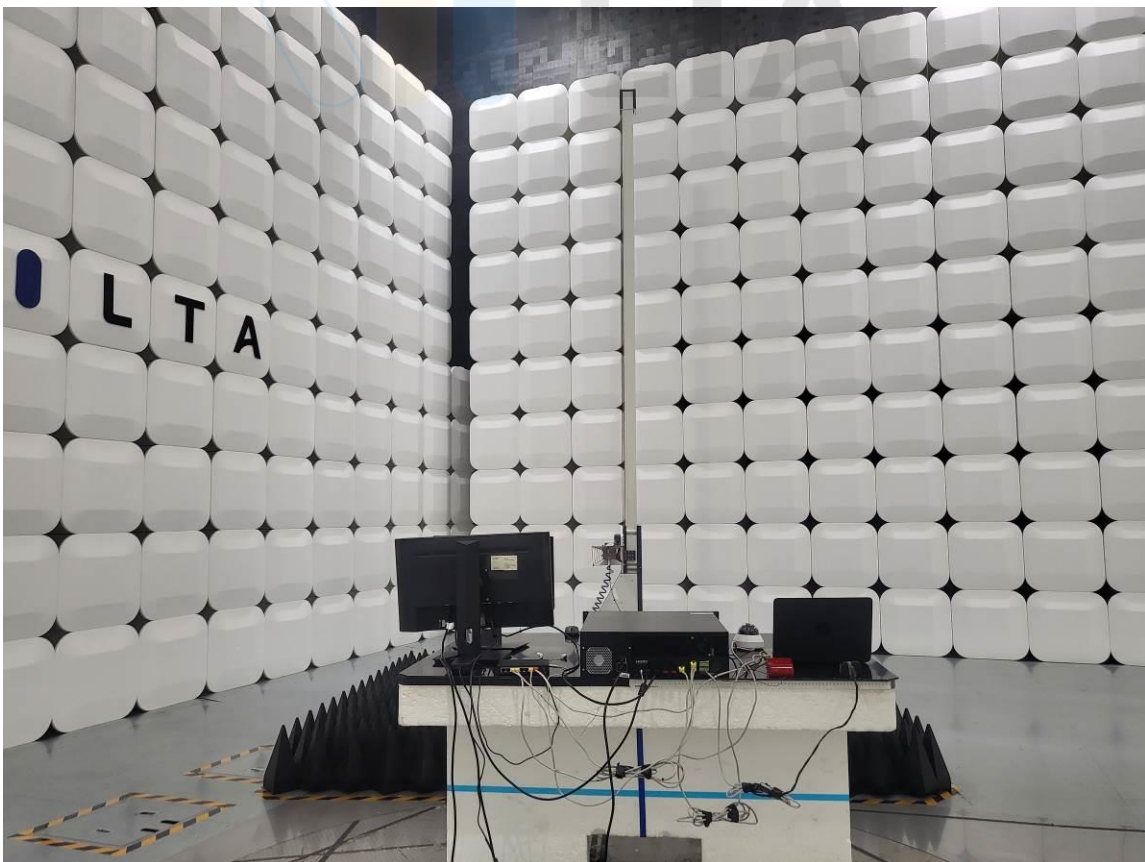
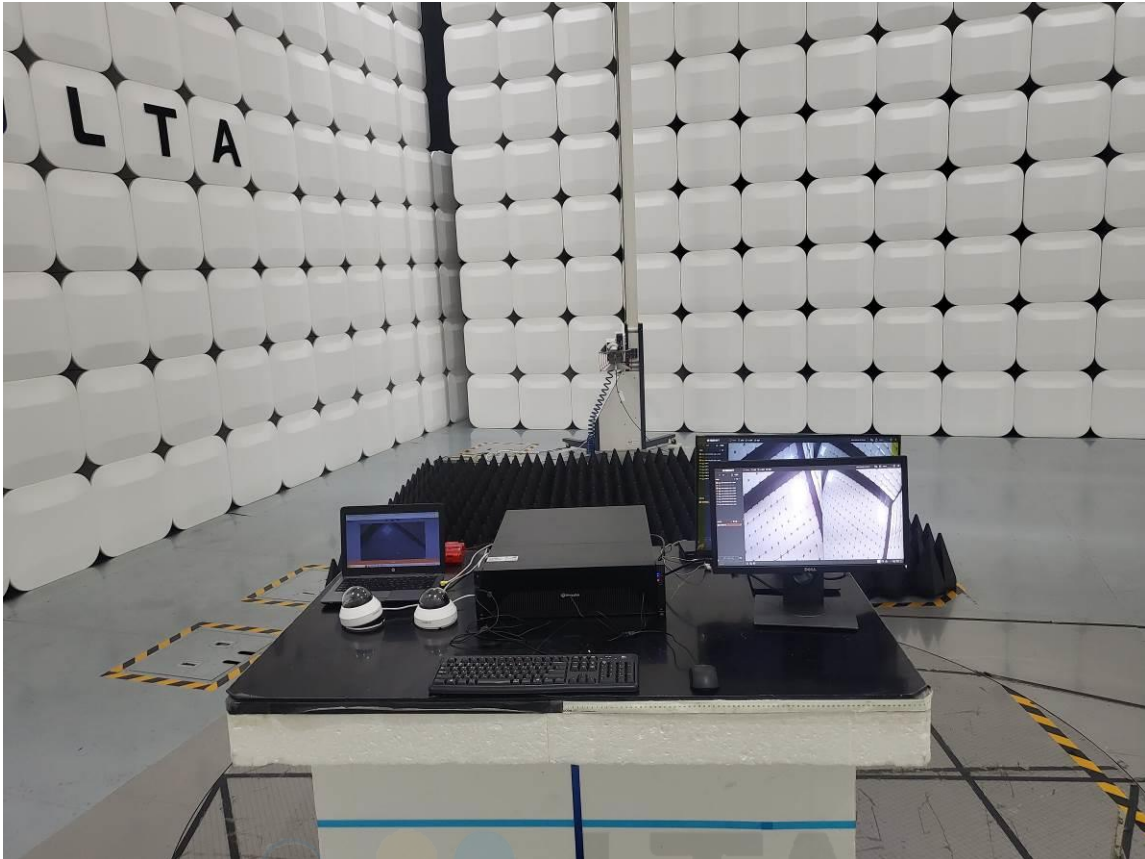
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## Radiated Emissions - Above 1 GHz

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EUT

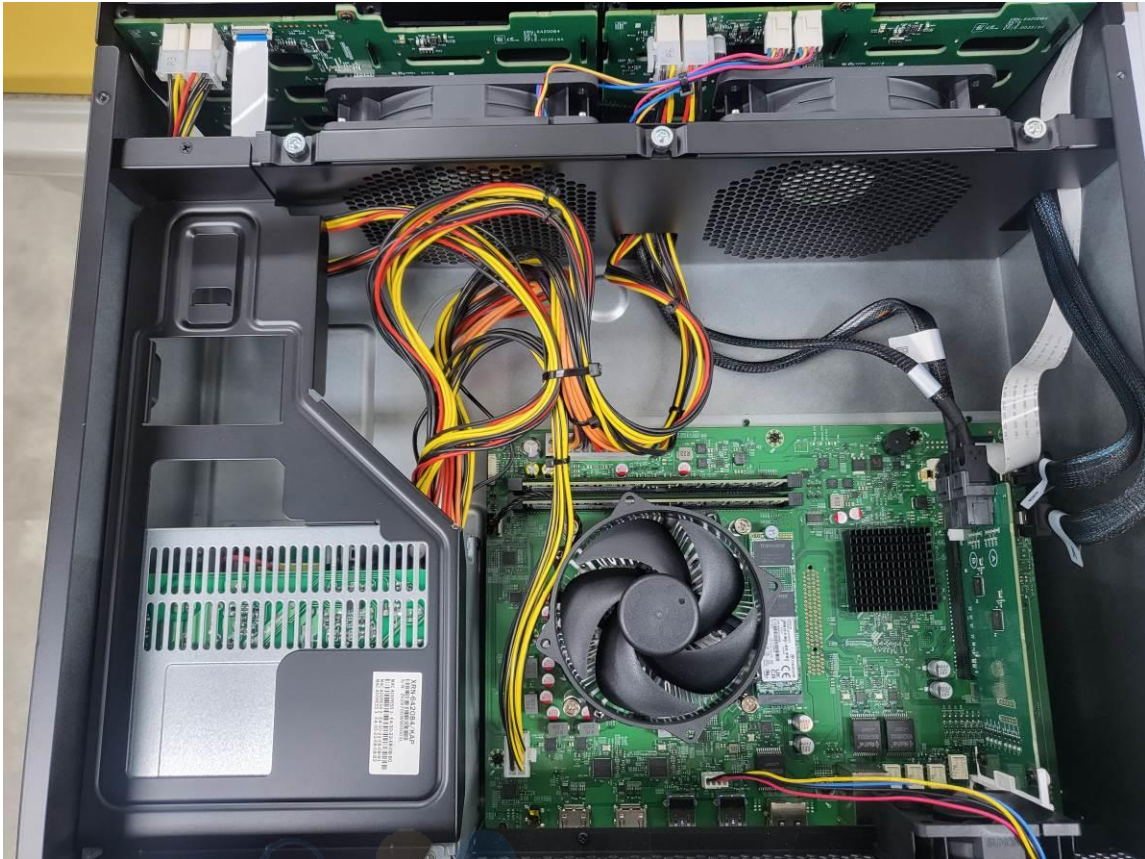
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## EUT

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## Modification

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