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## EMC TEST REPORT

Dates of Tests: July 28 – August 09, 2024

Project No: 240717-1056

Test Site : LTA Co., Ltd.

Model No.

**XRN-6420B2**

APPLICANT

**Hanwha Vision Co., Ltd**

**Equipment Name** : NETWORK VIDEO RECORDER  
**Manufacturer** : Hanwha Vision Co., Ltd  
**Model name** : XRN-6420B2  
**Additional Model name** : XRN-3220B2  
**Test Device Serial No.:** : Identification  
**Directive** : Electromagnetic Compatibility Directive 2014/30/EU  
Regulations 2016/1091  
**Rule Part(s)** : EN 55032:2015/A11:2020  
EN 50130-4:2011/A1:2014  
EN 61000-3-2:2014  
EN 61000-3-3:2013  
**Data of issue** : August 13, 2024

This test report is issued under the authority of:

The test was supervised by:

Young Kyu Shin, Technical Manager

Ahn Hyun Young, 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        | 13.08.2024    | LR500122408K    | Initial     |

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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 “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  
 Equipment Name : NETWORK VIDEO RECORDER  
 Model name : XRN-6420B2  
 Additional Model name : XRN-3220B2  
 Serial number : Identification  
 Date of receipt : July 17, 2024  
 EUT condition : Pre-production  
 Interface Ports : AC IN, HDMI #1~2, AUDIO OUT, USB #1~4, NETWORK #1~3, ALARM IN, ALARM OUT, GROUND  
 Power rating : AC 100 ~ 240 V, 50 / 60 Hz

### 2-3 Modification

- NONE

### 2-4 Model Specification

- Do not test because the Console port of the device under test is an engineer port

### 2-5 Test conditions

Temp. / Humid. / Pressure : (22 – 26) °C / (47 - 55) % R.H. / (99.1) kPa  
 Tested Model : XRN-6420B2  
 Test mode : Operating mode  
 Tested Voltage : AC 230 V, 50 Hz

**2-6 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<br/>RECORDER</b> | <b>XRN-6420B2</b> | <b>N/A</b>        | <b>HANWHA VISION<br/>VIETNAM COMPANY<br/>LIMITED<br/>D-TECH CO.,LTD.</b> | <b>EUT</b>     |
| MOUSE                             | MOKJUO            | 44A08568          | Primax Electronics Ltd.                                                  | EUT            |
| <b>ACCESSORY</b>                  |                   |                   |                                                                          |                |
| <b>Equipment Name</b>             | <b>Model Name</b> | <b>Serial No.</b> | <b>Manufacturer</b>                                                      | <b>Remarks</b> |
| KEY BOARD                         | N/A               | N/A               | ATEC                                                                     | -              |
| USB MEMORY                        | N/A               | N/A               | SANDISK                                                                  | 2EA            |
| EAR PHONE                         | N/A               | N/A               | N/A                                                                      | -              |
| CCTV                              | XNO-8030RT/EX     | N/A               | HANWHA TECHWIN CO.,<br>LTD                                               | 2EA            |
| ALARM JIG#1                       | N/A               | N/A               | N/A                                                                      | -              |
| ALARM JIG#2                       | N/A               | N/A               | N/A                                                                      | -              |
| NOTEBOOK                          | ELITEBOOK         | N/A               | HP                                                                       | -              |
| POE INJECTOR                      | N/A               | N/A               | N/A                                                                      | -              |
| MONITOR #1                        | N/A               | N/A               | TG                                                                       | -              |
| MONITOR #2                        | N/A               | N/A               | SAMSUNG                                                                  | -              |

**2-7 Cable List**

| Cable List |            |                 |          |            |        |
|------------|------------|-----------------|----------|------------|--------|
| From       |            | To              |          | Length (m) | Shield |
| Type       | I/O Port   | Type            | I/O Port |            |        |
| EUT        | AC IN      | AC POWER SOURCE | AC OUT   | 1.0        | NO     |
|            | HDMI #1    | MONITOR #1      | HDMI     | 1.2        | NO     |
|            | HDMI #2    | MONITOR #2      | HDMI     | 1.2        | NO     |
|            | AUDIO OUT  | EAR PHONE       | AUDIO IN | 0.8        | NO     |
|            | USB #1~2   | USB MEMORY #1,2 | USB      | -          | -      |
|            | USB #3     | MOUSE           | -        | 1.2        | NO     |
|            | USB #4     | KEYBOARD        | -        | 1.2        | NO     |
|            | NETWORK #1 | POE INJECTOR    | LAN #1   | 3.0        | NO     |
|            | NETWORK #2 | NOTEBOOK        | LAN      | 3.0        | NO     |
|            | NETWORK #3 | POE INJECTOR    | LAN #2   | 3.0        | NO     |
|            | ALARM IN   | ALARM JIG #1    | -        | 0.8        | NO     |
|            | ALARM OUT  | ALARM JIG #2    | -        | 0.5        | NO     |
|            | GROUND     | GROUND          | GROUND   | 1.0        | NO     |

### 3. Test Report

#### 3.1 Summary of tests

| Reference                                                    | Parameter                         | Status<br>(note)     |
|--------------------------------------------------------------|-----------------------------------|----------------------|
| <b>I. Emission</b>                                           |                                   |                      |
| Conducted Emissions                                          | EN 55032:2015/A11:2020            | C                    |
| Radiated Emissions                                           | EN 55032:2015/A11:2020            | C                    |
| Harmonic Current Emission                                    | EN 61000-3-2:2014                 | NA <sup>Note 3</sup> |
| Voltage Fluctuations and Flicker                             | EN 61000-3-3:2013                 | C                    |
| <b>II. Immunity (EN 50130-4:2011/A1:2014)</b>                |                                   |                      |
| Electrostatic Discharge                                      | EN 61000-4-2:2009                 | C                    |
| RF Electromagnetic Field                                     | EN 61000-4-3:2006/A1:2008/A2:2010 | C                    |
| Electrical Fast Transients                                   | EN 61000-4-4:2012                 | C                    |
| Surges                                                       | EN 61000-4-5:2014/A1:2017         | C                    |
| Conducted Disturbances,<br>Induced by Radio-Frequency Fields | EN 61000-4-6:2014/AC:2015         | C                    |
| Voltage dips and Interruptions                               | EN 61000-4-11:2004/A1:2017        | C                    |
| Main supply voltage variations                               | EN 50130-4:2011/A1:2014           | 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.

Note 3: We did not test EN 61000-3-2 (Harmonic current emissions) for the XRN-6420B2 because equipment whose rated power is less or equal 75 W don't need to be tested.



## 3.2 EMISSION

### 3.2.1 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 ports.

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

|                             |                          |
|-----------------------------|--------------------------|
| Measurement Frequency range | : 150 kHz – 30 MHz       |
| Test method                 | : EN 55032:2015/A11:2020 |
| 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 Factors

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.

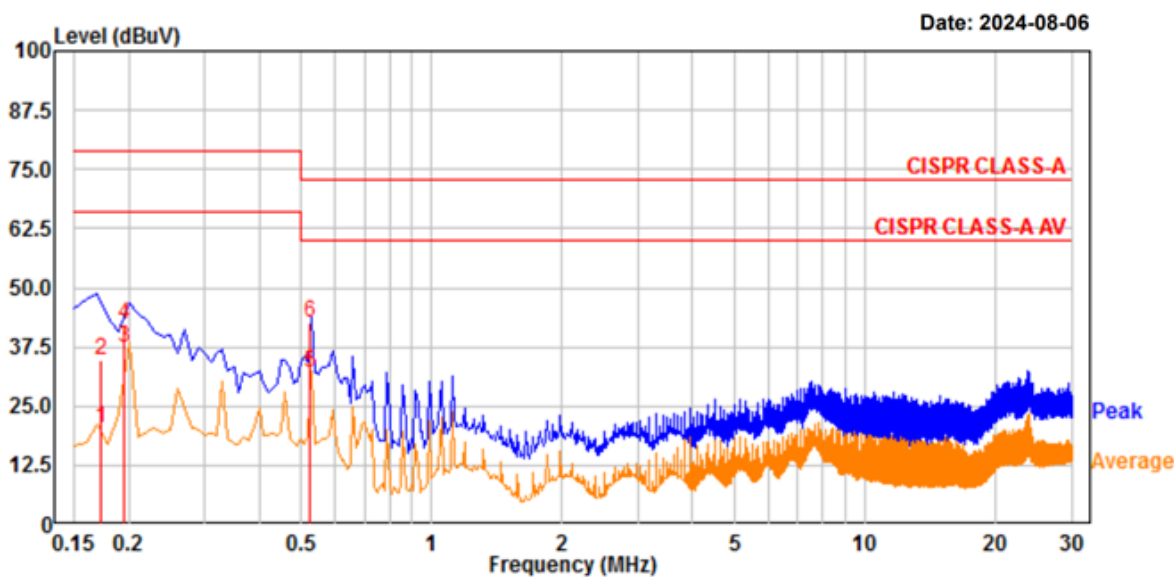
Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150  $\Omega$  to the telecommunication port under test (conversion factor is  $20 \log_{10} 150/I = 44$  dB)

Conducted Emissions (LINE)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 240717-1056       | Phase         | : LINE             |
| Test Mode    | : Operating         | Test Power    | : AC 230 V / 50 Hz |
| Temp./ Humi. | : 24 'C / 52 % 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.  | 0.173       | 15.22            | 0.86             | 19.47     | 34.69                | 20.33                | 79.00               | 66.00               | 44.31              | 45.67              | Line  |
| 4.  | 0.195       | 22.88            | 17.76            | 19.47     | 42.35                | 37.23                | 79.00               | 66.00               | 36.65              | 28.77              | Line  |
| 6.  | 0.526       | 23.14            | 12.44            | 19.49     | 42.63                | 31.93                | 73.00               | 60.00               | 30.37              | 28.07              | Line  |

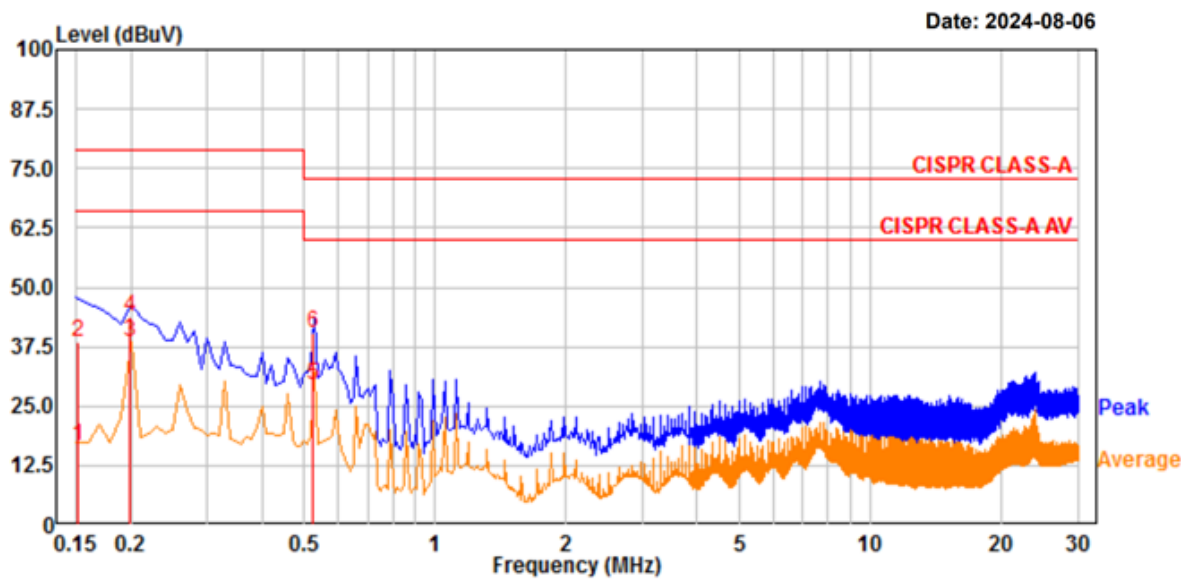
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (NEUTRAL)



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|              |                     |               |                    |
|--------------|---------------------|---------------|--------------------|
| Project No.  | : 240717-1056       | Phase         | : NEUTRAL          |
| Test Mode    | : Operating         | Test Power    | : AC 230 V / 50 Hz |
| Temp./ Humi. | : 24 'C / 52 % 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.  | 0.151       | 18.93            | -2.95            | 19.46     | 38.39                | 16.51                | 79.00               | 66.00               | 40.61              | 49.49              | neutral |
| 4.  | 0.200       | 24.38            | 19.22            | 19.46     | 43.84                | 38.68                | 79.00               | 66.00               | 35.16              | 27.32              | neutral |
| 6.  | 0.524       | 20.78            | 9.86             | 19.49     | 40.27                | 29.35                | 73.00               | 60.00               | 32.73              | 30.65              | neutral |

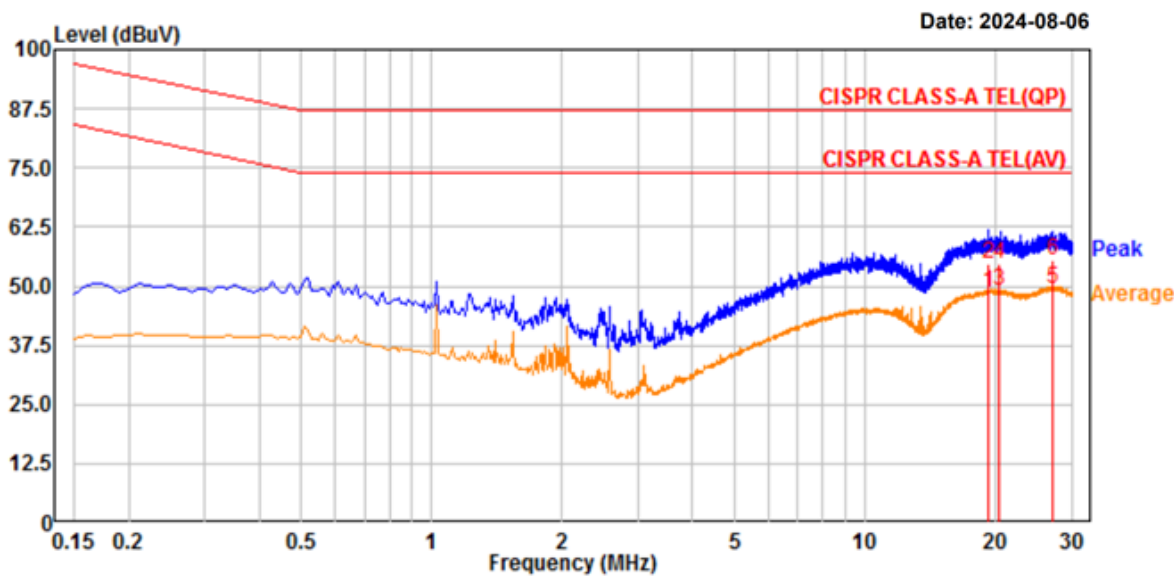
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL\_100 M (LAN #1))



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|              |                     |               |                     |
|--------------|---------------------|---------------|---------------------|
| Project No.  | : 240717-1056       | Phase         | : TEL_100M (LAN #1) |
| Test Mode    | : Operating         | Test Power    | : AC 230 V / 50 Hz  |
| Temp./ Humi. | : 24 'C / 52 % 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.  | 19.276      | 34.94            | 29.08            | 19.74     | 54.68                | 48.82                | 87.00               | 74.00               | 32.32              | 25.18              | Line  |
| 4.  | 20.337      | 34.99            | 29.12            | 19.77     | 54.76                | 48.89                | 87.00               | 74.00               | 32.24              | 25.11              | Line  |
| 6.  | 27.101      | 35.39            | 29.51            | 20.03     | 55.42                | 49.54                | 87.00               | 74.00               | 31.58              | 24.46              | Line  |

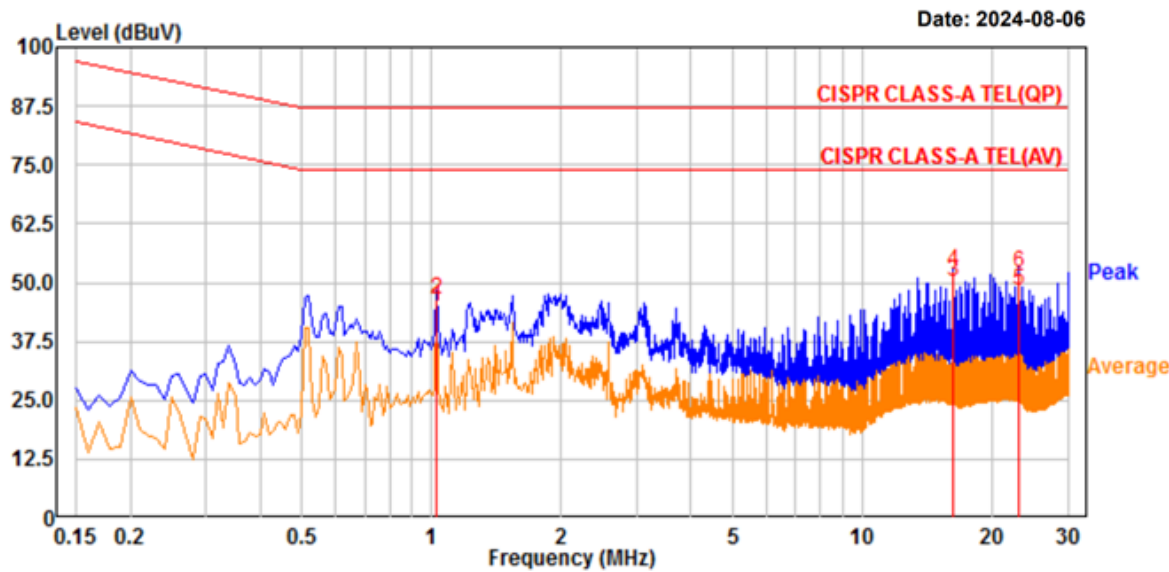
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

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



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|              |                     |               |                      |
|--------------|---------------------|---------------|----------------------|
| Project No.  | : 240717-1056       | Phase         | : TEL_1000M (LAN #2) |
| Test Mode    | : Operating         | Test Power    | : AC 230 V / 50 Hz   |
| Temp./ Humi. | : 24 'C / 52 % 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.  | 1.027       | 27.23            | 25.42            | 19.33     | 46.56                | 44.75                | 87.00               | 74.00               | 40.44              | 29.25              | Line  |
| 4.  | 16.228      | 32.86            | 30.55            | 19.56     | 52.42                | 50.11                | 87.00               | 74.00               | 34.58              | 23.89              | Line  |
| 6.  | 23.127      | 32.29            | 28.46            | 19.69     | 51.98                | 48.15                | 87.00               | 74.00               | 35.02              | 25.85              | Line  |

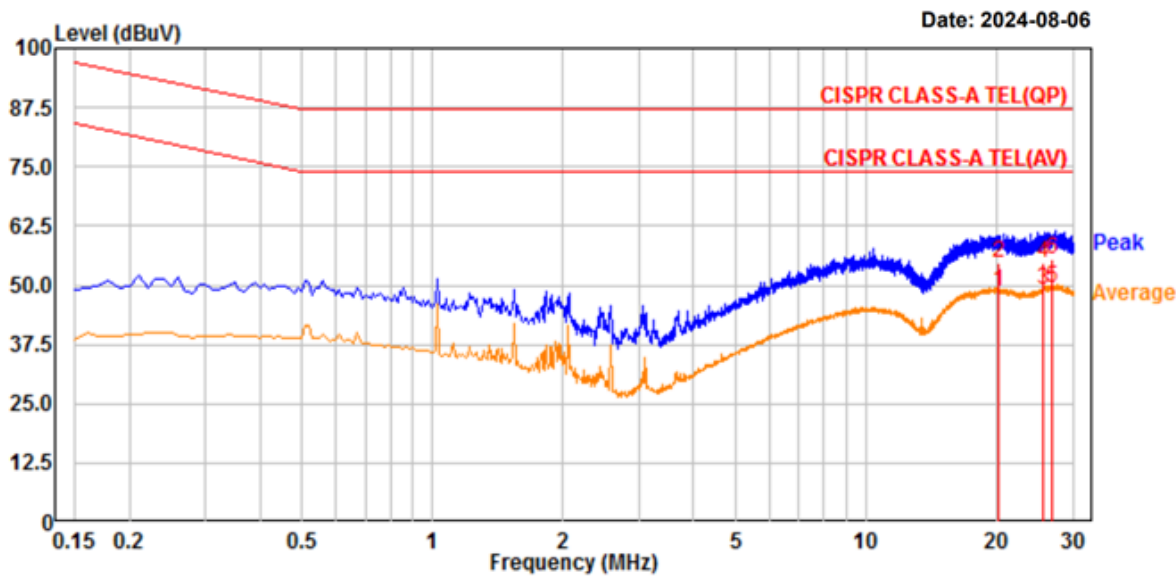
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL\_100 M (LAN #3))



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|              |                     |               |                     |
|--------------|---------------------|---------------|---------------------|
| Project No.  | : 240717-1056       | Phase         | : TEL_100M (LAN #3) |
| Test Mode    | : Operating         | Test Power    | : AC 230 V / 50 Hz  |
| Temp./ Humi. | : 24 'C / 52 % 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.  | 20.116      | 34.94            | 29.06            | 19.76     | 54.70                | 48.82                | 87.00               | 74.00               | 32.30              | 25.18              | Line  |
| 4.  | 25.639      | 34.80            | 28.96            | 19.98     | 54.78                | 48.94                | 87.00               | 74.00               | 32.22              | 25.06              | Line  |
| 6.  | 26.708      | 35.35            | 29.45            | 20.01     | 55.36                | 49.46                | 87.00               | 74.00               | 31.64              | 24.54              | Line  |

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

### 3.2.2 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                 | : EN 55032:2015/A11:2020             |
| 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 3.4 GHz, the measurement shall 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                                |

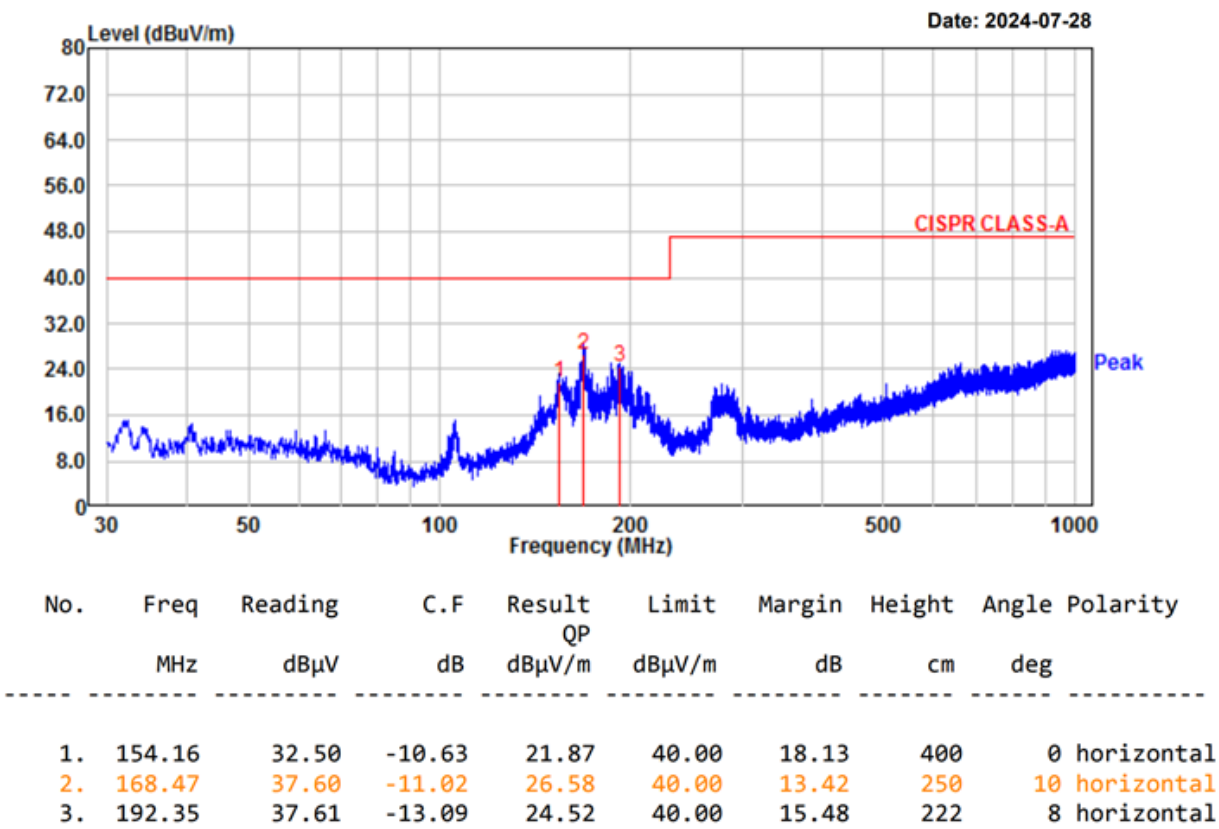
NOTE: The lower limit applies at the transition frequency.

Radiated Emissions (Below 1 GHz) / H



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. : 240717-1056                      Temp/Humi: 22 'C / 55 % R.H.  
-----  
Test Mode : Operating                      Tested by: AHN H Y  
-----  
Power : AC 230 V / 50 Hz  
-----



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

Radiated Emissions (Below 1 GHz) / V



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

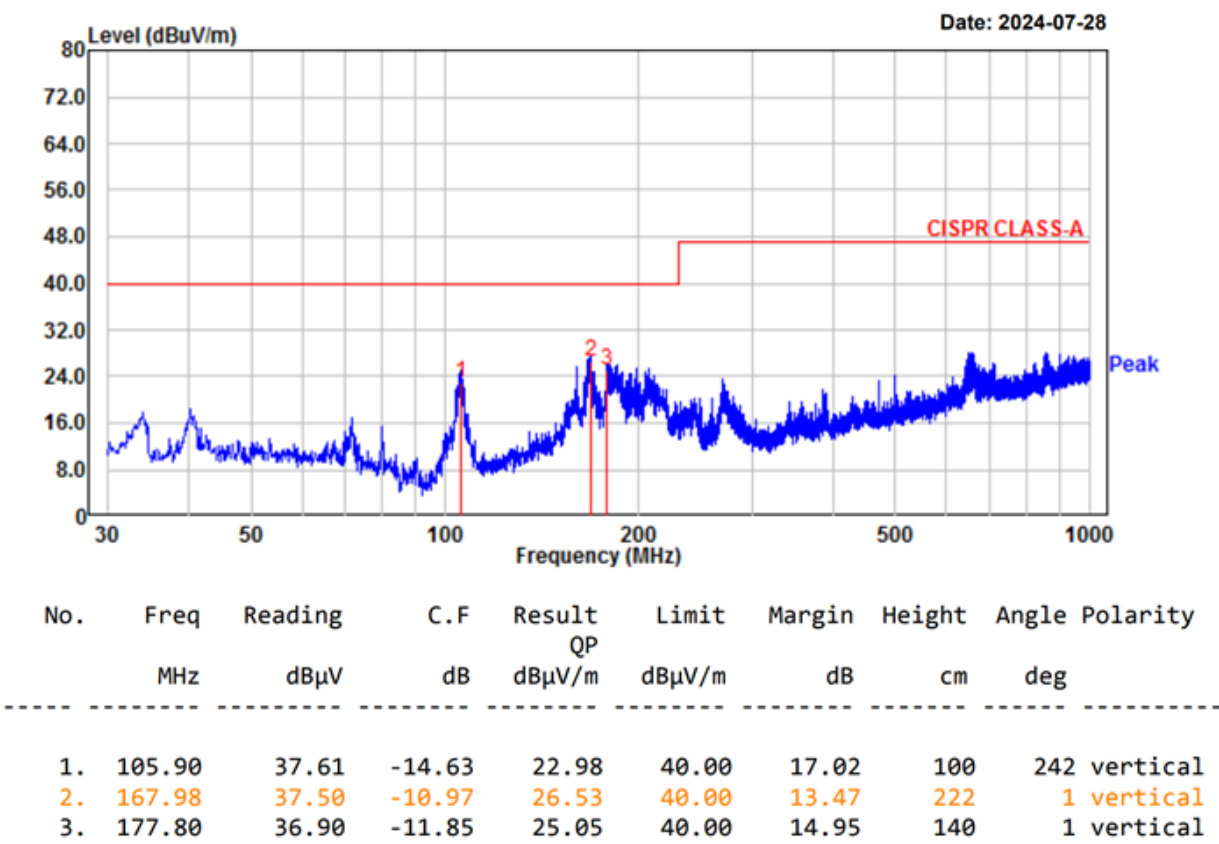
Project No. : 240717-1056

Temp/Humi: 22 'C / 55 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 230 V / 50 Hz



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  
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www.ltalab.com

Project No. : 240717-1056

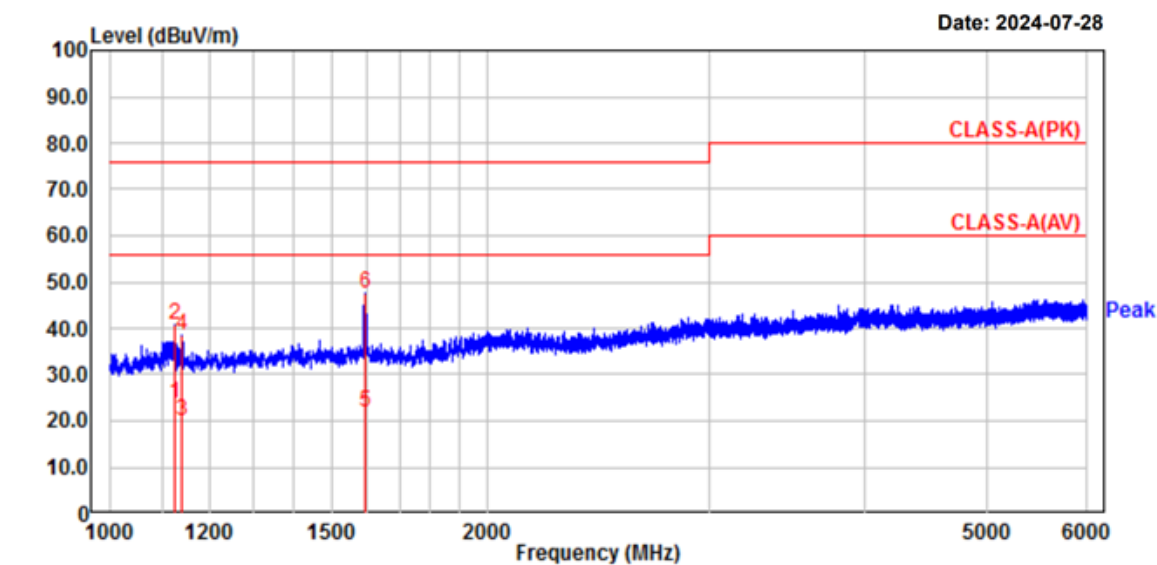
Temp/Humi: 22 'C / 55 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 230 V / 50 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.  | 1126.88     | 45.53      | 28.50      | -4.66 | 40.87      | 23.84      | 76.00      | 56.00      | 35.13    | 32.16    | 100    | 223   | horizontal |
| 4.  | 1141.25     | 42.83      | 24.69      | -4.51 | 38.32      | 20.18      | 76.00      | 56.00      | 37.68    | 35.82    | 100    | 202   | horizontal |
| 6.  | 1595.00     | 48.39      | 22.90      | -0.89 | 47.50      | 22.01      | 76.00      | 56.00      | 28.50    | 33.99    | 100    | 300   | horizontal |

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

Radiated Emissions (Above 1 GHz) / V



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. : 240717-1056

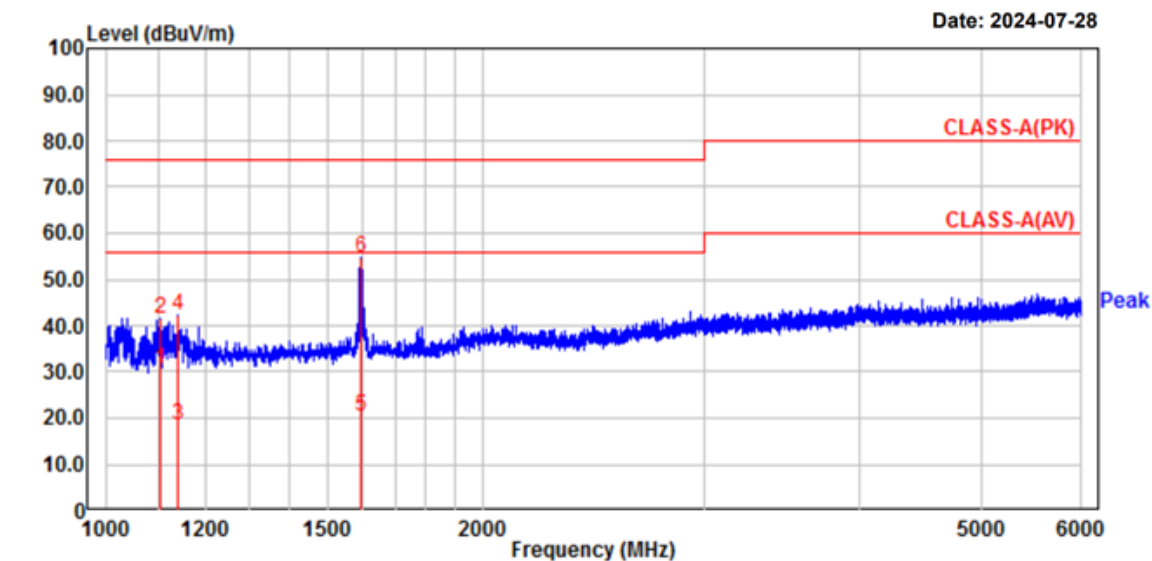
Temp/Humi: 22 'C / 55 % R.H.

Test Mode : Operating

Tested by: AHN H Y

Power : AC 230 V / 50 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.  | 1103.13     | 46.57      | 35.50      | -4.90 | 41.67      | 30.60      | 76.00      | 56.00      | 34.33    | 25.40    | 100    | 292   | vertical |
| 4.  | 1139.38     | 46.91      | 22.90      | -4.54 | 42.37      | 18.36      | 76.00      | 56.00      | 33.63    | 37.64    | 100    | 255   | vertical |
| 6.  | 1598.13     | 55.42      | 21.40      | -0.88 | 54.54      | 20.52      | 76.00      | 56.00      | 21.46    | 35.48    | 100    | 274   | vertical |

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

### 3.2.3 Harmonic Current Emission

**Definition:**

This part deals with the Limitation of harmonic currents injected into the public supply system.

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

|               |                         |
|---------------|-------------------------|
| Test method   | : EN 61000-3-2:2014     |
| Test Location | : Shielded Room         |
| Test mode     | : Operating mode        |
| Rated power   | : 40.259W               |
| Result        | : <b>Not Applicable</b> |

**Measurement Data:**

- We did not test EN IEC 61000-3-2 (Harmonic Current Emission) for the XRN-6420B2 because equipment whose rated power is less or equal 75 W don't need to be tested.

## Harmonic Current Emission

|                                                                                   |  |                                         |  |                 |                                                                                     |
|-----------------------------------------------------------------------------------|--|-----------------------------------------|--|-----------------|-------------------------------------------------------------------------------------|
| 07th August 2024 - 10:26:36                                                       |  | Ph:1 Page 1/10                          |  | IECSoft v2_7    |                                                                                     |
|  |  | <b>BS EN 61000-3-2:2014</b>             |  |                 |  |
| <b>Fluctuating Harmonics</b>                                                      |  |                                         |  |                 |                                                                                     |
| <b>Instrument Details</b>                                                         |  |                                         |  |                 |                                                                                     |
| Instrument Model                                                                  |  | PPA5511                                 |  |                 |                                                                                     |
| Serial Number                                                                     |  | 162-04957                               |  |                 |                                                                                     |
| Firmware Version                                                                  |  | 2.185                                   |  |                 |                                                                                     |
| N4L Calibration Date                                                              |  | 18th September 2017                     |  |                 |                                                                                     |
| Instrument Version                                                                |  | Standard                                |  |                 |                                                                                     |
| <b>Test Settings</b>                                                              |  |                                         |  |                 |                                                                                     |
| Class                                                                             |  | Class A                                 |  |                 |                                                                                     |
| Mode                                                                              |  | Operating                               |  |                 |                                                                                     |
| <b>Equipment Under Test</b>                                                       |  |                                         |  |                 |                                                                                     |
| Brand                                                                             |  | Hanwha Vision Co., Ltd                  |  |                 |                                                                                     |
| Model                                                                             |  | XRN-6420B2                              |  |                 |                                                                                     |
| Serial                                                                            |  | N/A                                     |  |                 |                                                                                     |
| Impedance Network ID                                                              |  | N/A                                     |  |                 |                                                                                     |
| <b>Test Conditions</b>                                                            |  |                                         |  |                 |                                                                                     |
|                                                                                   |  | <b>User Entered</b>                     |  | <b>Measured</b> |                                                                                     |
| Rated Voltage                                                                     |  | N/A                                     |  | 230.982V        |                                                                                     |
| Rated Current                                                                     |  | N/A                                     |  | 228.977mA       |                                                                                     |
| Rated Frequency                                                                   |  | N/A                                     |  | 50.000Hz        |                                                                                     |
| Rated Power                                                                       |  | N/A                                     |  | 40.259W         |                                                                                     |
| <b>Additional Test Information</b>                                                |  |                                         |  |                 |                                                                                     |
| Measured Power Factor                                                             |  | 0.7612                                  |  |                 |                                                                                     |
| Max Current THD                                                                   |  | 39.30%                                  |  |                 |                                                                                     |
| Average THC                                                                       |  | 81.101mA                                |  |                 |                                                                                     |
| Max Power                                                                         |  | 42.217W                                 |  |                 |                                                                                     |
| Max F.Current                                                                     |  | 223.393mA                               |  |                 |                                                                                     |
| Average F.Current                                                                 |  | 212.432mA                               |  |                 |                                                                                     |
| Minimum Current                                                                   |  | 100A                                    |  |                 |                                                                                     |
| Test Duration                                                                     |  | 2.5 minutes                             |  |                 |                                                                                     |
| <b>Additional Test Details</b>                                                    |  |                                         |  |                 |                                                                                     |
| Operator                                                                          |  | AHN H Y                                 |  |                 |                                                                                     |
| Lab Name                                                                          |  | N/A                                     |  |                 |                                                                                     |
| Location                                                                          |  | N/A                                     |  |                 |                                                                                     |
| Notes                                                                             |  |                                         |  |                 |                                                                                     |
| Signature                                                                         |  | 23 °C 50 % R.H.                         |  |                 |                                                                                     |
| <b>Results</b>                                                                    |  | <b>Test - N/A. Rated Power &lt; 75W</b> |  |                 |                                                                                     |

Test not applicable

With the exception of lighting equipment section 7 of the BS EN 61000-3-2:2014 standard declares that no Harmonic current limits are specified for equipment with a rated power of 75W or less.

### 3.2.4 Voltage Fluctuations and Flicker

**Definition:**

This section is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

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

|               |                     |
|---------------|---------------------|
| Test method   | : EN 61000-3-3:2013 |
| Test Location | : Shielded Room     |
| Test mode     | : Operating mode    |
| Result        | : <b>Complies</b>   |

**Measurement Data:**

- Refer to the Next page



## Voltage Fluctuations and Flicker

|                                                                                   |                         |                             |                 |                                                                                     |  |
|-----------------------------------------------------------------------------------|-------------------------|-----------------------------|-----------------|-------------------------------------------------------------------------------------|--|
| 07th August 2024 - 10:39:07                                                       |                         | Ph:1 Page 1/3               |                 | IECSoft v2_7                                                                        |  |
|  |                         | <b>BS EN 61000-3-3:2013</b> |                 |  |  |
| <b>Flickermeter</b>                                                               |                         |                             |                 |                                                                                     |  |
| <b>Instrument Details</b>                                                         |                         |                             |                 |                                                                                     |  |
| Instrument Model                                                                  | PPA5511                 |                             |                 |                                                                                     |  |
| Serial Number                                                                     | 162-04957               |                             |                 |                                                                                     |  |
| Firmware Version                                                                  | 2.185                   |                             |                 |                                                                                     |  |
| N4L Calibration Date                                                              | 18th September 2017     |                             |                 |                                                                                     |  |
| Instrument Version                                                                | Standard                |                             |                 |                                                                                     |  |
| <b>Test Settings</b>                                                              |                         |                             |                 |                                                                                     |  |
| Class                                                                             | Voltage                 |                             |                 |                                                                                     |  |
| Mode                                                                              | Operating (4.0%)        |                             |                 |                                                                                     |  |
| Minimum Current                                                                   | 10A                     |                             |                 |                                                                                     |  |
| PST                                                                               | 10 minutes              |                             |                 |                                                                                     |  |
| PLT                                                                               | 12 PSTs                 |                             |                 |                                                                                     |  |
| <b>Equipment Under Test</b>                                                       |                         |                             |                 |                                                                                     |  |
| Brand                                                                             | Hanwha Vision Co., Ltd  |                             |                 |                                                                                     |  |
| Model                                                                             | XRN-6420B2              |                             |                 |                                                                                     |  |
| Serial                                                                            | N/A                     |                             |                 |                                                                                     |  |
| Impedance Network ID                                                              | N/A                     |                             |                 |                                                                                     |  |
| <b>Test Conditions</b>                                                            |                         |                             |                 |                                                                                     |  |
|                                                                                   | <b>User Entered</b>     |                             | <b>Measured</b> |                                                                                     |  |
| Rated Voltage                                                                     | N/A                     |                             | 230.984V        |                                                                                     |  |
| Rated Current                                                                     | N/A                     |                             | N/A             |                                                                                     |  |
| Rated Frequency                                                                   | N/A                     |                             | 50.000Hz        |                                                                                     |  |
| Rated Power                                                                       | N/A                     |                             | N/A             |                                                                                     |  |
| D max                                                                             | 0.0691% (Limit: 4.0%)   |                             |                 |                                                                                     |  |
| T max                                                                             | 0.0000 s (Limit: 0.5 s) |                             |                 |                                                                                     |  |
| DC max                                                                            | 0.0021% (Limit: 3.3%)   |                             |                 |                                                                                     |  |
| <b>Additional Test Details</b>                                                    |                         |                             |                 |                                                                                     |  |
| Operator                                                                          | AHN H Y                 |                             |                 |                                                                                     |  |
| Lab Name                                                                          | N/A                     |                             |                 |                                                                                     |  |
| Location                                                                          | N/A                     |                             |                 |                                                                                     |  |
| Notes                                                                             |                         |                             |                 |                                                                                     |  |
| Signature                                                                         | 23 °C 50 % R.H.         |                             |                 |                                                                                     |  |
| <b>Results</b>                                                                    | <b>Phase1: PASS</b>     |                             |                 |                                                                                     |  |

|                                   |                    |                        |          |              |         |         |         |         |
|-----------------------------------|--------------------|------------------------|----------|--------------|---------|---------|---------|---------|
| 07th August 2024 - 10:39:07       |                    | Ph:1 Page 2/3          |          | IECSoft v2_7 |         |         |         |         |
| BS EN 61000-3-3:2013 Flickermeter |                    |                        |          |              |         |         |         |         |
| Instrument Details                |                    |                        |          |              |         |         |         |         |
| Instrument Model                  |                    | PPA5511                |          |              |         |         |         |         |
| Instrument Serial                 |                    | 162-04957              |          |              |         |         |         |         |
| Instrument Firmware               |                    | 2.185                  |          |              |         |         |         |         |
| Equipment Under Test              |                    |                        |          |              |         |         |         |         |
| Brand                             |                    | Hanwha Vision Co., Ltd |          |              |         |         |         |         |
| Model                             |                    | XRN-6420B2             |          |              |         |         |         |         |
| Serial                            |                    | N/A                    |          |              |         |         |         |         |
| Flicker Test Results              |                    |                        |          |              |         |         |         |         |
| PST no.                           | Status             | DC (%)                 | Dmax (%) | Tmax (s)     | PST     | PST Lim | PLT     | PLT Lim |
| 1                                 | Phase1: NO RESULTS | 0.00206                | 0.05411  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 2                                 | Phase1: PASS       | 0.00206                | 0.05568  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 3                                 | Phase1: PASS       | 0.00206                | 0.06187  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 4                                 | Phase1: PASS       | 0.00206                | 0.06315  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 5                                 | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 6                                 | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 7                                 | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 8                                 | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 9                                 | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 10                                | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 11                                | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | N/A     |
| 12                                | Phase1: PASS       | 0.00206                | 0.06908  | 0.00000      | 0.08226 | 1.00000 | 0.08226 | 0.65000 |

### 3.3 IMMUNITY

#### 3.3.1 Electrostatic Discharge

**Definition:**

The test assesses the ability of the EUT to operate as intended in the event of an electrostatic discharge.

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

|                                       |                                                                |
|---------------------------------------|----------------------------------------------------------------|
| Test date                             | : 2024. 08. 09.                                                |
| Test method                           | : EN 61000-4-2 :2009                                           |
| Temperature / Humidity / Pressure     | : 23.2 °C / 54 % R.H. / 99.1 kPa                               |
| Discharge Impedance                   | : $(330 \pm 10 \%) \Omega$ / $(150 \pm 10 \%) \text{ pF}$      |
| Type of Discharge (air discharge)     | : $\pm 2 \text{ kV}$ , $\pm 4 \text{ kV}$ , $\pm 8 \text{ kV}$ |
| Type of Discharge (contact discharge) | : $\pm 4 \text{ kV}$                                           |
| Number of discharges at each point    | : 10 of each polarity                                          |
| Discharge Repetition on Rate          | : 1 / sec                                                      |
| Test Location                         | : Shielded Room                                                |
| Test mode                             | : Operating mode                                               |
| Result                                | : <b>Complies</b>                                              |

**Measurement Data:**
**ESD Test Point and Result**
**1. Indirect Discharge**

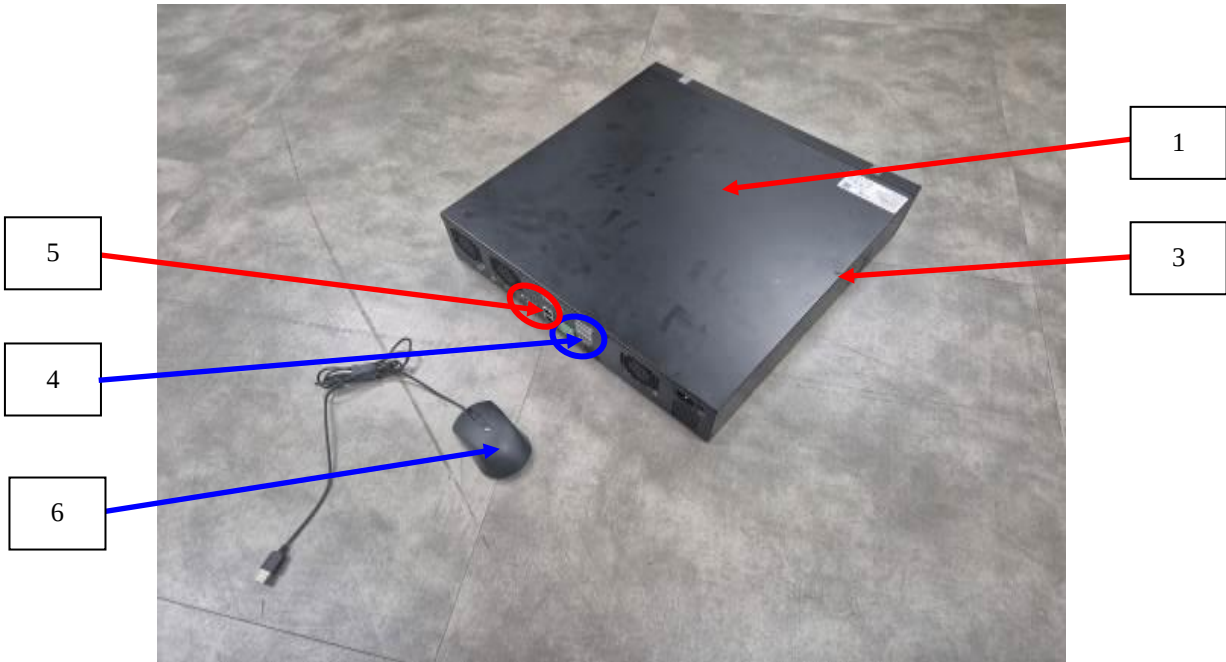
| No. | Position | Kind of Discharge | Results  | Remarks                |
|-----|----------|-------------------|----------|------------------------|
| 1   | HCP      | Contact           | Complies | No reaction recognized |
| 2   | VCP      | Contact           | Complies | No reaction recognized |

**2. Direct Discharge**

| Position No. | Position  | Kind of Discharge | Result   | Remarks                |
|--------------|-----------|-------------------|----------|------------------------|
| 1            | Enclosure | Contact           | Complies | No reaction recognized |
| 2            | Enclosure | Air               | Complies | No reaction recognized |
| 3            | SCREW     | Contact           | Complies | No reaction recognized |
| 4            | Port      | Air               | Complies | No reaction recognized |
| 5            | Port      | Contact           | Complies | No reaction recognized |
| 5            | MOUSE     | Air               | Complies | No reaction recognized |

ESD TEST POINT

[Air discharge]  
[Contact discharge]



### 3.3.2 RF Electromagnetic Field

**Definition:**

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic field disturbance.

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

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| Test date              | : 2024. 08. 09                                                |
| Test method            | : EN 61000-4-3:2006/A1:2008/A2:2010                           |
| Temperature / Humidity | : 24.8 °C / 47 % R.H.                                         |
| Frequency range        | : 80 MHz to 2,700 MHz                                         |
| Test level             | : 10 V/m (measured unmodulated)                               |
| Amplitude Modulation   | : AM, 80 %, 1 kHz Sinusoidal<br>PM, 1 Hz (0.5s ON : 0.5s OFF) |
| Step size              | : 1 % of fundamental                                          |
| Dwell Time             | : 3 s                                                         |
| Test Location          | : 3 m Chamber                                                 |
| Test mode              | : Operating mode                                              |
| Result                 | : <b>Complies</b>                                             |

**Measurement Data:**

| Port       | Side  | Result   | Remarks                |
|------------|-------|----------|------------------------|
| Horizontal | Front | Complies | No reaction recognized |
|            | Left  | Complies | No reaction recognized |
|            | Rear  | Complies | No reaction recognized |
|            | Right | Complies | No reaction recognized |
| Vertical   | Front | Complies | No reaction recognized |
|            | Left  | Complies | No reaction recognized |
|            | Rear  | Complies | No reaction recognized |
|            | Right | Complies | No reaction recognized |

### 3.3.3 Electrical Fast Transients

**Definition:**

The test assesses the ability of the EUT to operate as intended in the event of fast transients presence on one of the input/output ports.

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

Test date : 2024. 08. 09  
Test method : EN 61000-4-4:2012  
Temperature / Humidity : 24 °C / 49 % R.H.  
Cable length : > 3 m  
Test level : 2.0 kV (AC power input port)  
1.0 kV (Signal port)  
Polarity : Negative/ positive  
Repetition frequency : 100 kHz  
Test Location : Shielded Room  
Test mode : Operating mode  
Result : **Complies**

**Measurement Data:**

| Power Line | Test level | Result   | Remarks                |
|------------|------------|----------|------------------------|
| L – N - PE | ±2 kV      | Complies | No reaction recognized |

| Signal Line | Test level | Result   | Remarks                |
|-------------|------------|----------|------------------------|
| LAN #1      | ±1 kV      | Complies | No reaction recognized |
| LAN #2      | ±1 kV      | Complies | No reaction recognized |
| LAN #3      | ±1 kV      | Complies | No reaction recognized |

### 3.3.4 Surges

#### Definition:

The test assesses the ability of the EUT to operate as intended in the event of surge presence on the AC main power input ports.

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

|                        |                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------|
| Test date              | : 2024. 08. 09                                                                                   |
| Test method            | : EN 61000-4-5:2014/A1:2017                                                                      |
| Temperature / Humidity | : 23.2 °C / 54 % R.H.                                                                            |
| Test level             | : $\pm 0.5$ kV, $\pm 1$ kV (line to line), $\pm 0.5$ kV, $\pm 1$ kV, $\pm 2$ kV (line to ground) |
| Polarity               | : Negative/ positive                                                                             |
| Wave shape             | : 1.2/ 50 $\mu$ s pulse                                                                          |
| Number of surges       | : 5 (at each phase)                                                                              |
| Test Location          | : Shielded Room                                                                                  |
| Test mode              | : Operating mode                                                                                 |
| Result                 | : <b>Complies</b>                                                                                |

#### Measurement Data:

| Phase | Line                  | level                   | Result   | Remark                 |
|-------|-----------------------|-------------------------|----------|------------------------|
| 0°    | Line(L) to Line(N)    | $\pm(0.5, 1.0)$ kV      | Complies | No reaction recognized |
|       | Line(L) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
|       | Line(N) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
| 90°   | Line(L) to Line(N)    | $\pm(0.5, 1.0)$ kV      | Complies | No reaction recognized |
|       | Line(L) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
|       | Line(N) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
| 180°  | Line(L) to Line(N)    | $\pm(0.5, 1.0)$ kV      | Complies | No reaction recognized |
|       | Line(L) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
|       | Line(N) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
| 270°  | Line(L) to Line(N)    | $\pm(0.5, 1.0)$ kV      | Complies | No reaction recognized |
|       | Line(L) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |
|       | Line(N) to ground(PE) | $\pm(0.5, 1.0, 2.0)$ kV | Complies | No reaction recognized |

3.3.5 Conducted Disturbances, Induced by Radio-Frequency Fields

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic disturbance on the input/output ports.

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

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| Test date              | : 2024. 08. 09.                                               |
| Test method            | : EN 61000-4-6:2014/AC:2015                                   |
| Temperature / Humidity | : 26 °C / 53 % R.H.                                           |
| Frequency range        | : 0.15 MHz – 100 MHz                                          |
| Test level             | : 10 Vrms unmodulated                                         |
| Amplitude Modulation   | : AM, 80 %, 1 kHz Sinusoidal<br>PM, 1 Hz (0.5s ON : 0.5s OFF) |
| Step size              | : 1 % of fundamental.                                         |
| Test Location          | : Shielded Room                                               |
| Test mode              | : Operating mode                                              |
| Result                 | : <b>Complies</b>                                             |

Measurement Data:

| Power Port | Result   | Remarks                |
|------------|----------|------------------------|
| Power      | Complies | No reaction recognized |

| Signal Port | Result   | Remarks                |
|-------------|----------|------------------------|
| LAN #1      | Complies | No reaction recognized |
| LAN #2      | Complies | No reaction recognized |
| LAN #3      | Complies | No reaction recognized |



### 3.3.6 Voltage dips and Interruptions

**Definition:**

The test assesses the ability of the EUT to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

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

Test date : 2024. 08. 09  
Test method : EN 61000-4-11:2004/A1:2017  
Temperature / Humidity : 23.2 °C / 54 % R.H.  
Ut : 230 Vac  
Test Location : Shielded Room  
Test mode : Operating mode  
Result : **Complies**

**Measurement Data:**

| Test Level<br>%Ut | Voltage droop<br>and interruptions<br>%Ut | Duration of<br>Reduction<br>( period) | Result   | Remarks                                                                                                              |
|-------------------|-------------------------------------------|---------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------|
| 80                | 20                                        | 250                                   | Complies | No reaction recognized                                                                                               |
| 70                | 30                                        | 25                                    | Complies | No reaction recognized                                                                                               |
| 40                | 60                                        | 10                                    | Complies | No reaction recognized                                                                                               |
| 0                 | 100                                       | 250                                   | Complies | EUT was turned off during the test.<br>Re-operation by user's control.<br>After the test, EUT was normally operated. |

3.3.7 Mains supply voltage variations

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage variations present on the AC mains power input ports.

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

|                        |                              |
|------------------------|------------------------------|
| Test date              | : 2024. 08. 09.              |
| Test method            | : EN 61000-4-11:2004/A1:2017 |
| Temperature / Humidity | : 23.2 °C / 54 % R.H.        |
| Supply Voltage maximum | : $U_{nom} + 10 \%$          |
| Supply Voltage minimum | $U_{nom} - 15 \%$            |
| Ut                     | : 230 Vac                    |
| Test Location          | : Shielded Room              |
| Test mode              | : Operating mode             |
| Result                 | : <b>Complies</b>            |

Measurement Data:

$U_{nom}$  = Nominal mains voltage. Where provision is made to adapt the equipment to suit a number of nominal supply voltages (e.g. by transformer tap changing), the above conditioning severity shall be applied for each nominal voltage, with the equipment suitably adapted. For equipment which is claimed to be suitable for a range of nominal mains voltages (e.g. 220/240 V) without adaptation,  $U_{max} = (\text{Maximum } U_{nom}) + 10 \%$ , and  $U_{min} = (\text{Minimum } U_{nom}) p 15 \%$ . In any case the range of  $U_{nom}$  must include the European nominal mains voltage of 230 V.

Mains supply voltage variations

| Test LevelCondition |      | Test Level (V) | Result   | Remarks                |
|---------------------|------|----------------|----------|------------------------|
| Unom                | +10% | 253            | Complies | No reaction recognized |
| Unom                | -15% | 195.5          | Complies | No reaction recognized |

## **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      | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | Pulse Limiter     | ESH3-Z2              | Rohde & Schwarz | 100710      | 2025.03.08 | 1 year   |
| <input checked="" 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       | 2025.03.08 | 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 checked="" type="checkbox"/> | Amplifier         | 8449B             | Agilent         | 3008A02126 | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | 3115              | ETS             | 114105     | 2025.04.02 | 1 year   |
| <input checked="" type="checkbox"/> | TEST PROGRAM      | e3 20181212a (V9) | AUDIX           | -          | -          | -        |

#### Harmonic Current Emission / Voltage Fluctuations and Flicker

|                                     | Item                        | Model Name | Manufacturer   | Serial No. | Next Cal.  | Interval |
|-------------------------------------|-----------------------------|------------|----------------|------------|------------|----------|
| <input checked="" type="checkbox"/> | Precision Power Analyzer    | PPA5511    | Newtons4th Ltd | 162-04957  | 2024.08.18 | 1 year   |
| <input checked="" type="checkbox"/> | Reference Impedance Network | ES4152     | NF Corp.       | 9074424    | 2024.08.18 | 1 year   |

**Electrostatic Discharge**

|                                     | Item          | Model Name | Manufacturer | Serial No. | Next Cal.  | Interval |
|-------------------------------------|---------------|------------|--------------|------------|------------|----------|
| <input checked="" type="checkbox"/> | ESD Simulator | ESS-2000   | NOISEKEN     | 8000C03241 | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | ESD GUN       | TC-815R    | NOISEKEN     | ESS0382069 | 2024.08.22 | 1 year   |

**RF Electromagnetic Field**

|                                     | Item                           | Model Name    | Manufacturer | Serial No.       | Next Cal.  | Interval |
|-------------------------------------|--------------------------------|---------------|--------------|------------------|------------|----------|
| <input checked="" type="checkbox"/> | Signal Generator               | E4432B        | Agilent      | MY41310673       | 2024.08.22 | 1 year   |
| <input checked="" type="checkbox"/> | Power Meter                    | E4419B        | Agilent      | GB38410133       | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | Power Sensor                   | E9300A        | Agilent      | MY41497992       | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | Power Sensor                   | E9300A        | Agilent      | MY41497618       | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | WIDE BAND HIGH POWER AMPLIFIER | ITA0300KL-500 | INFINITECH   | 0300KL 20 09 001 | -          | -        |
| <input checked="" type="checkbox"/> | RF POWER AMPLIFIER             | ITA2000KL-120 | INFINITECH   | 200KL 1507 001   | -          | -        |
| <input checked="" type="checkbox"/> | RF POWER AMPLIFIER             | ITA4500KL-70  | INFINITECH   | 4500KL 1507 001  | -          | -        |
| <input checked="" type="checkbox"/> | RF POWER AMPLIFIER             | ITA0750KL-300 | INFINITECH   | 0750KL 1507 001  | -          | -        |
| <input checked="" type="checkbox"/> | Log.-Per.Antenna               | K9128         | RAPA         | NONE             | -          | -        |
| <input checked="" type="checkbox"/> | Signal Generator               | E4438C        | Agilent      | MY42080845       | 2024.08.22 | -        |
| <input checked="" type="checkbox"/> | HORN ANTENNA                   | BBHA 9120 A   | SCHWARZBECK  | BBHA 9120 A 481  | -          | -        |

**Electrical Fast Transients**

|                                     | Item                      | Model Name | Manufacturer | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|---------------------------|------------|--------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | Compact Generator         | Compact NX | EMTEST       | P1725200196 | 2024.08.23 | 1 year   |
| <input checked="" type="checkbox"/> | AC Power Source           | Variac NX  | EMTEST       | P1745207276 | 2024.08.23 | 1 year   |
| <input checked="" type="checkbox"/> | Capacitive Coupling Clamp | CCI        | EMTEST       | P1744207071 | 2024.08.23 | 1 year   |

**Surges**

|                                     | Item              | Model Name | Manufacturer | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|-------------------|------------|--------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | Compact Generator | Compact NX | EMTEST       | P1725200196 | 2024.08.23 | 1 year   |
| <input checked="" type="checkbox"/> | AC Power Source   | Variac NX  | EMTEST       | P1745207276 | 2024.08.23 | 1 year   |
| <input checked="" type="checkbox"/> | CDN               | CNV 508T5  | EMTEST       | P1742204940 | 2024.08.23 | 1 year   |
| <input type="checkbox"/>            | CDN               | CNV 508N1  | EMTEST       | P1742204940 | 2024.08.23 | 1 year   |

**Conducted Disturbances, Induced by Radio-Frequency Fields**

|                                     | Item               | Model Name   | Manufacturer | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|--------------------|--------------|--------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | Signal generator   | SML03        | R&S          | 103026/0013 | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | POWER METER        | NRVD         | R&S          | 101689      | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | POWER Sensor       | URV5-Z2      | R&S          | 100755      | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | POWER Sensor       | URV5-Z2      | R&S          | 100756      | 2025.03.08 | 1 year   |
| <input checked="" type="checkbox"/> | RF Power Amplifier | FLL75A       | FRANKONIA    | 1033        | -          | -        |
| <input checked="" type="checkbox"/> | EM INJECTION CLAMP | TSIC-23      | F.C.C        | 529         | 2025.03.14 | 1 year   |
| <input checked="" type="checkbox"/> | CDN (M1)           | TSCDN-M1-16A | F.C.C        | 07004       | 2024.08.22 | 1 year   |
| <input type="checkbox"/>            | CDN (M2)           | TSCDN-M2-16A | F.C.C        | 07008       | 2024.08.22 | 1 year   |
| <input type="checkbox"/>            | CDN (M2)           | TSCDN-M2-16A | F.C.C        | 07009       | 2025.03.21 | 1 year   |
| <input checked="" type="checkbox"/> | CDN (M3)           | TSCDN-M3-16A | F.C.C        | 07016       | 2025.03.19 | 1 year   |
| <input checked="" type="checkbox"/> | CDN (M3)           | TSCDN-M3-16A | F.C.C        | 07017       | 2024.08.22 | 1 year   |

**Voltage dips and Interruptions**

|                                     | Item              | Model Name | Manufacturer | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|-------------------|------------|--------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | Compact Generator | Compact NX | EMTEST       | P1725200196 | 2024.08.23 | 1 year   |
| <input checked="" type="checkbox"/> | AC Power Source   | Variac NX  | EMTEST       | P1745207276 | 2024.08.23 | 1 year   |

**Mains supply voltage variations**

|                                     | Item                               | Model Name      | Manufacturer | Serial No.  | Next Cal.  | Interval |
|-------------------------------------|------------------------------------|-----------------|--------------|-------------|------------|----------|
| <input checked="" type="checkbox"/> | Multifunctional AC/DC Power source | NetWave 3.1-230 | EMTEST       | P2119252057 | 2024.08.22 | 1 year   |

## **APPENDIX B**

### **PERFORMANCE CRITERIA**

### **Performance criteria**

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

### **Electrostatic discharge**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

### **Radiated electromagnetic fields**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

### **Fast transient burst**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of the bursts is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

### **Slow high energy voltage surge**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of the surges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.



### Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at  $U_0 = 130 \text{ dB}\mu\text{V}$ .

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at  $U_0 = 140 \text{ dB}\mu\text{V}$ , providing

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable settings, etc.)

(b) at  $U_0 = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used, and

(c) there is no observable deterioration of the picture at  $U_0 = 120 \text{ dB}\mu\text{V}$ .

The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

### Voltage dip/interruption

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

It is permitted to use ancillary equipment (e.g. A UPS) to meet the requirements of this clause. This shall be detailed in the test report and the manufacturer's installation manual.

Signaling a mains fault during the 100 % voltage reduction test is permitted.

### Mains supply voltage variations

There shall be no damage, malfunction or change of status due to the different supply voltage

conditions. The EUT shall meet the acceptance criteria for the functional test(see Clause 6), during the conditioning.

**APPENDIX C**

**PHOTOGRAPHS**

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## Conducted Emissions

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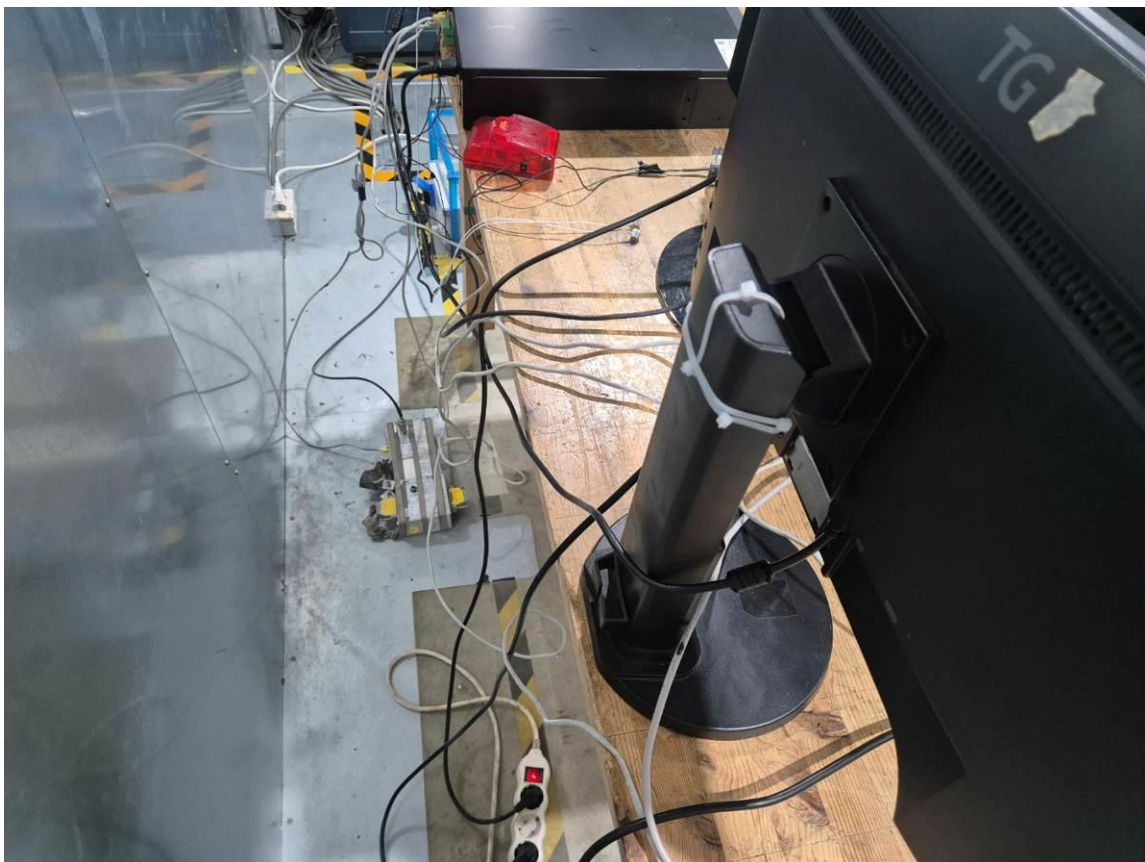




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## Conducted Emissions (TEL)

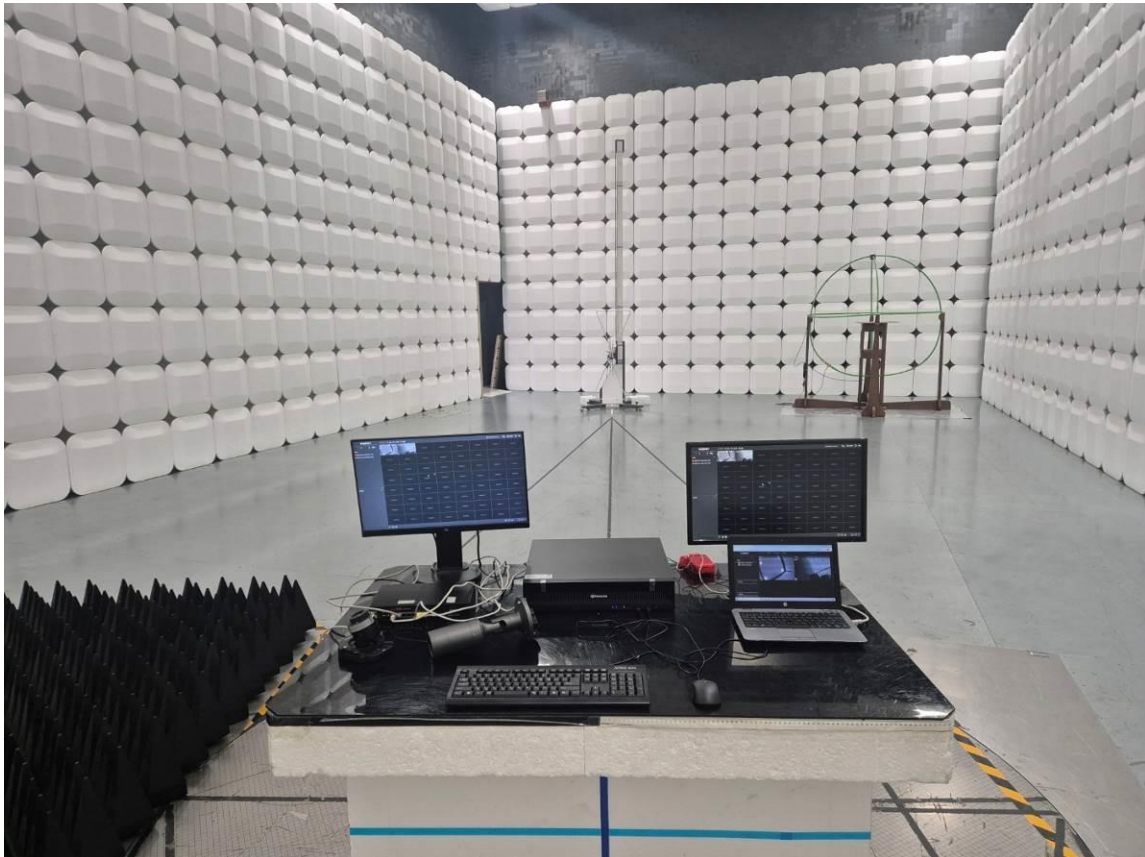
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## Radiated Emissions - Below 1 GHz

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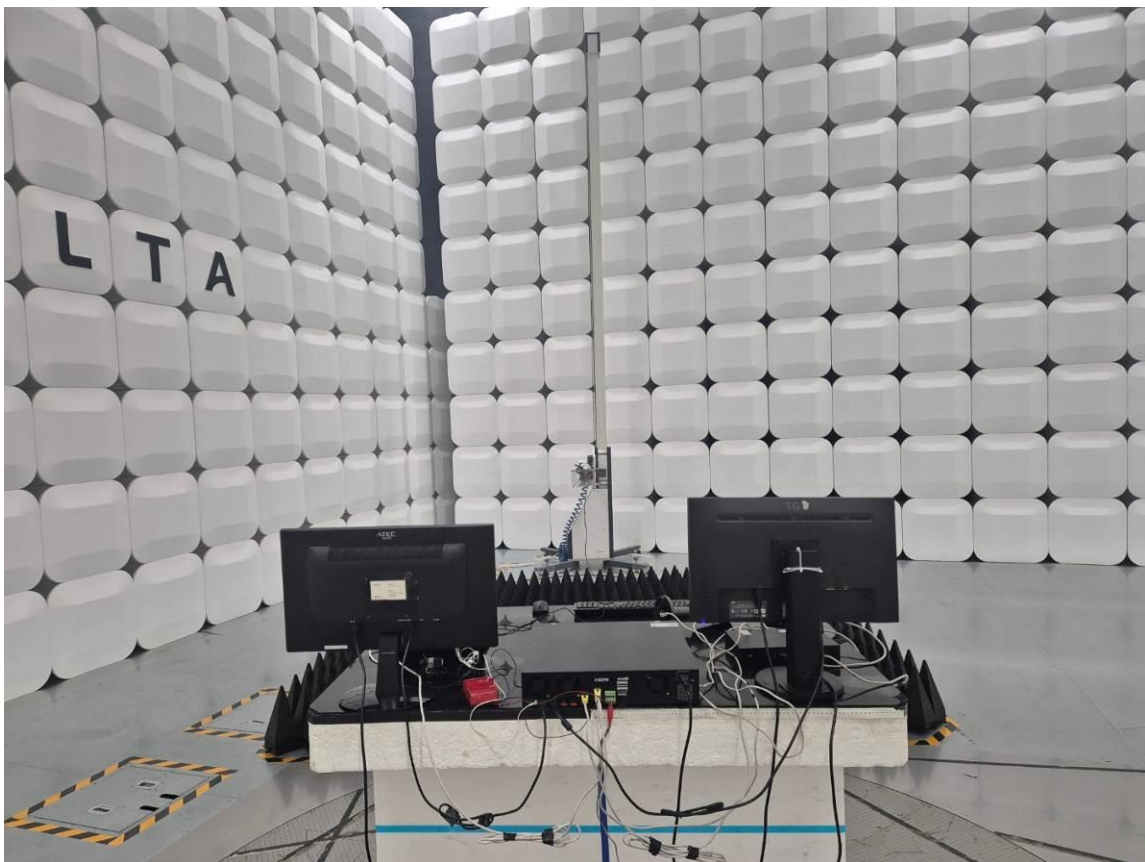
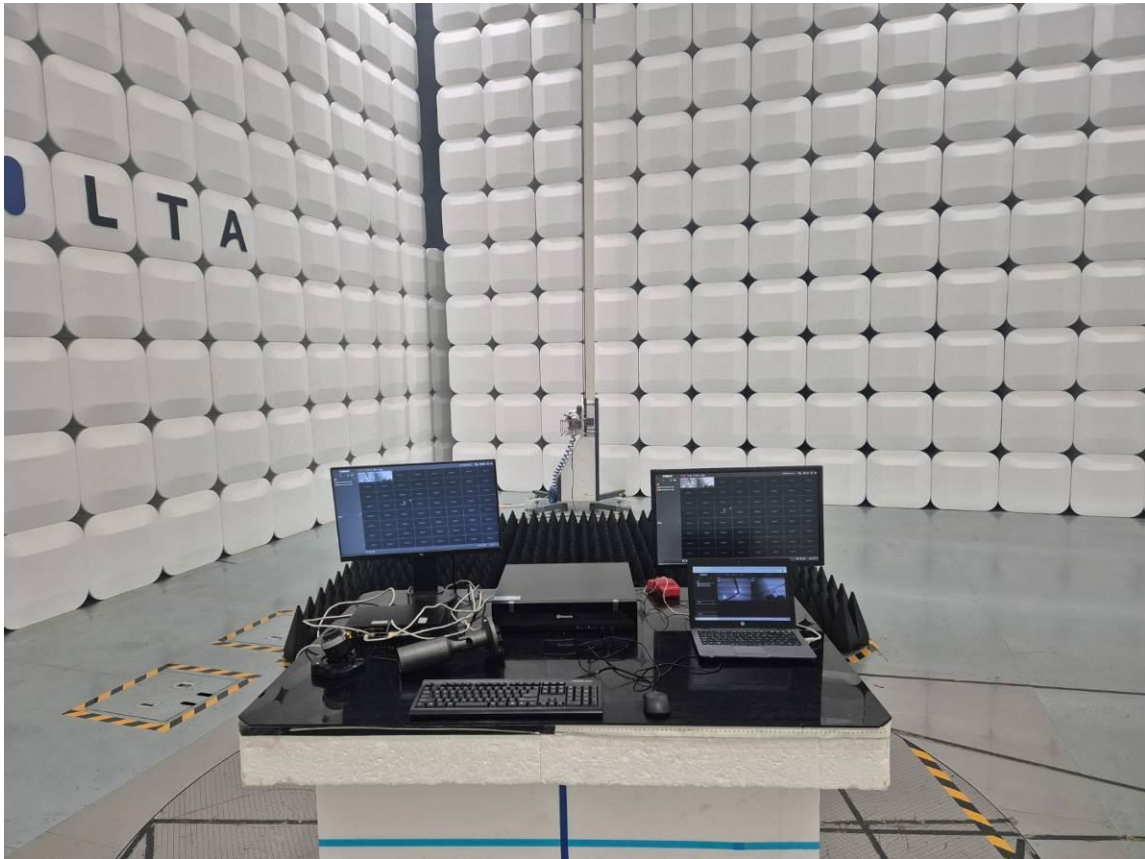




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## Radiated Emissions - Above 1 GHz

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## Harmonic Current Emission / Voltage Fluctuations and Flicker

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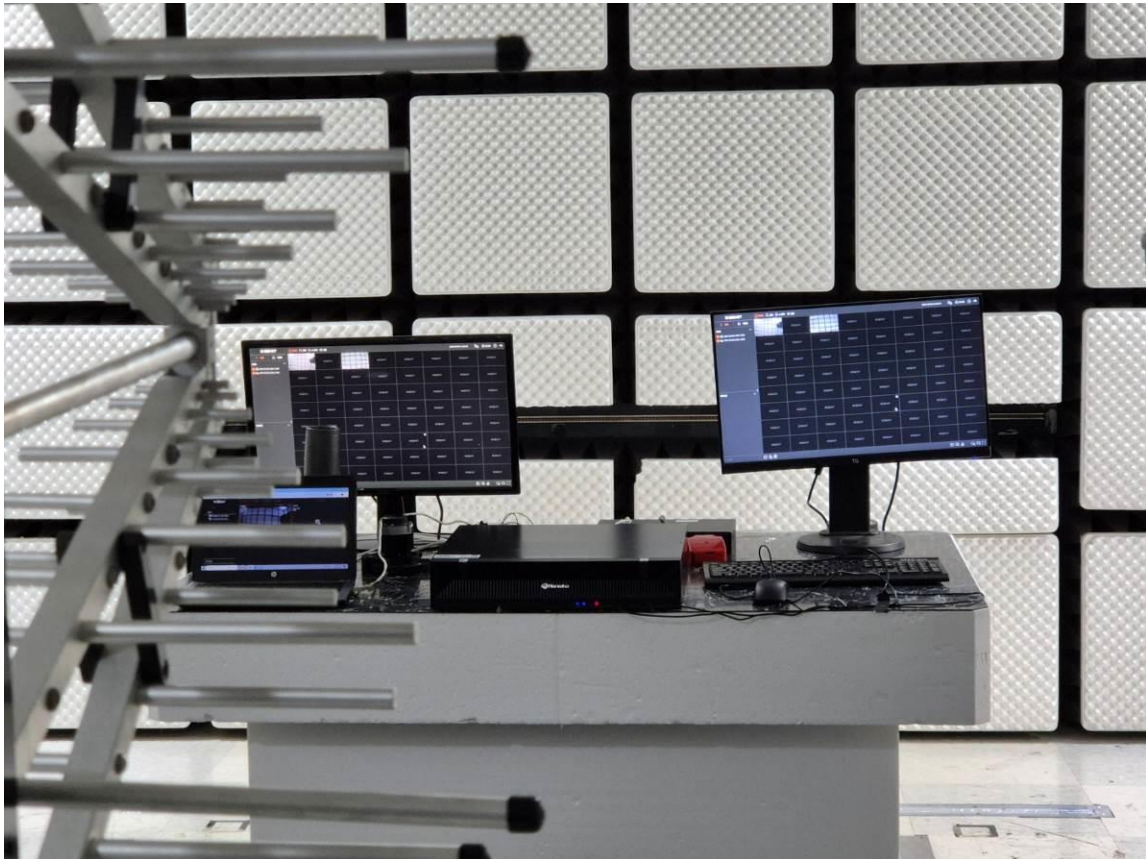
Electrostatic Discharge



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## RF Electromagnetic Field

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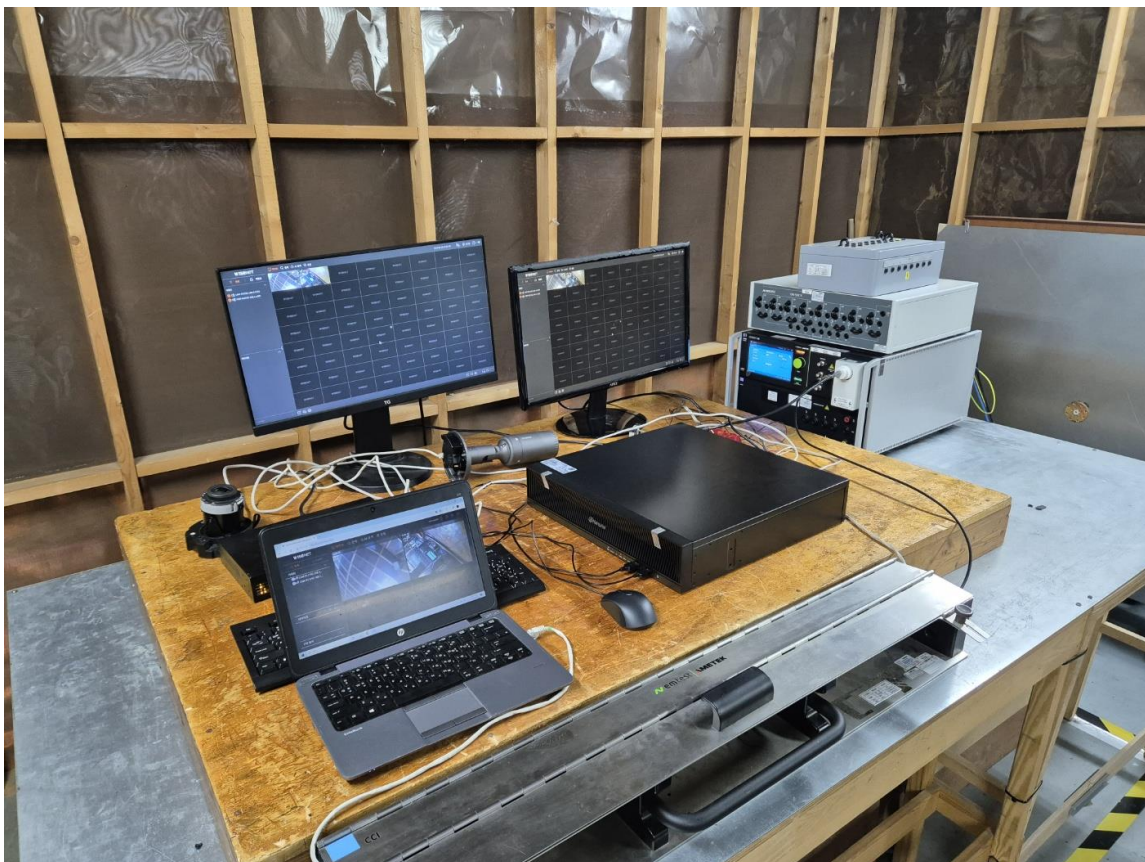
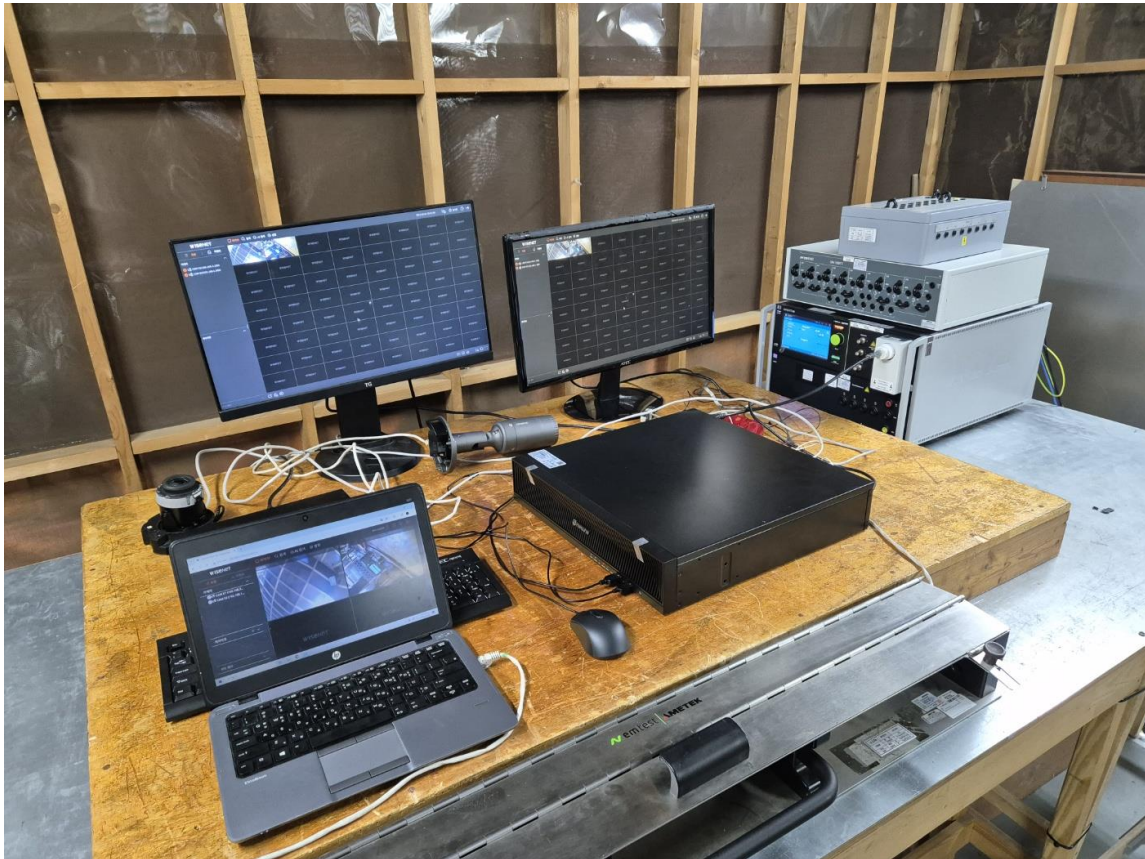




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## Electrical Fast Transients

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## Surges

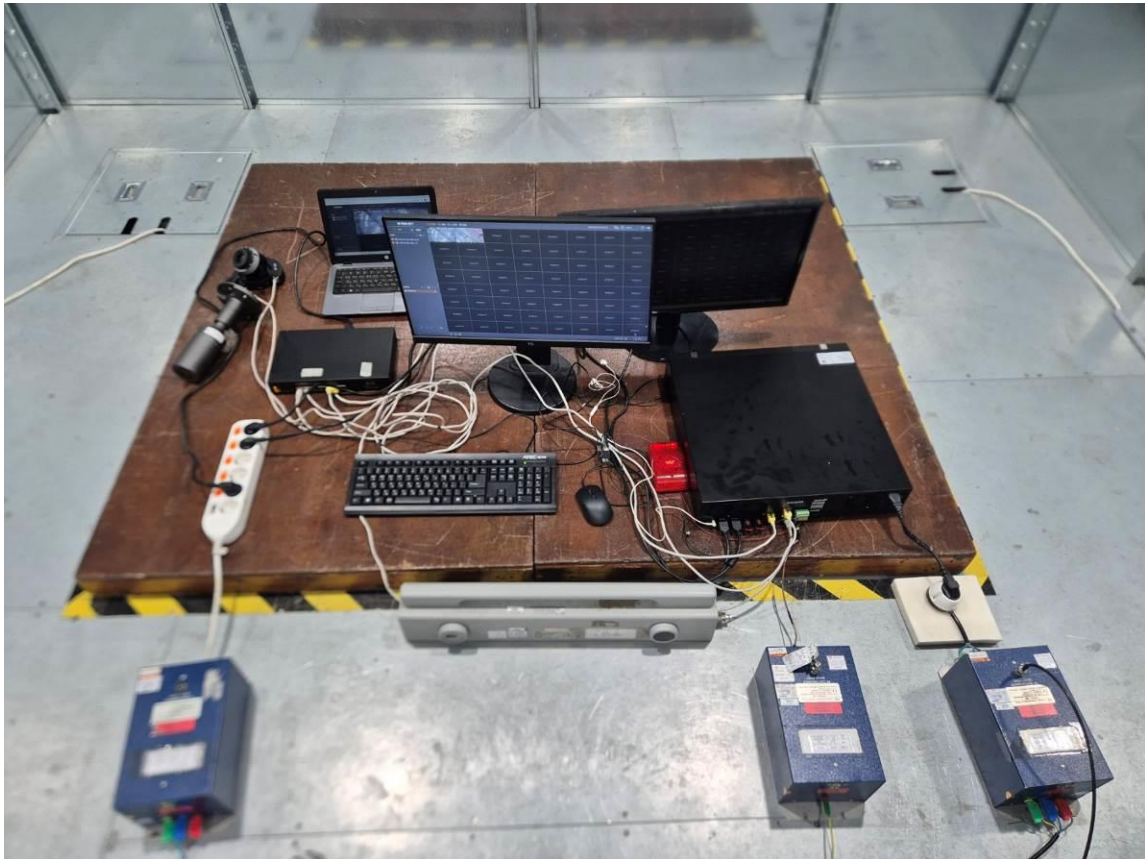
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## Conducted Disturbances, Induced by Radio-Frequency Fields

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## Voltage dips and short interruptions

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## Main supply Voltage Variation

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## EUT

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## EUT

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