



# TEST REPORT



Report No. : KES-EM252039

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**KES Co., Ltd.**

#3002, #3503, #3701, 40, Simin-daero365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Republic of Korea  
Tel : +82-31-425-6200, Fax : +82-31-341-3838

## 1. Client

Applicant : Hanwha Vision Co., Ltd.

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

## 2. Sample Description

Product name : LENS MODULE

Model/Type No. : SLA-F4780VA

Variant Model : -

Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED  
2. D-TECH CO.,LTD.

Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended Area, Nam Son Ward, Bac Ninh City, Bac Ninh Province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)

3. Date of Receipt : May. 15, 2025

4. Test date : Jun. 03, 2025 ~ Jun. 05, 2025

5. Date of Issue : Jun. 24, 2025

6. Test Results : In Compliance

Tested by

Reviewed by

---

Sung Keun, Park  
EMC Test Engineer

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Dong Hun, Jang  
EMC Technical Manager

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

**REPORT REVISION HISTORY**

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| Jun. 24, 2025 | KES-EM252039    | Issued           |
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## 1.0 General Product Description

Main Specifications of EUT are:

| Division                             |             | Specificity                |
|--------------------------------------|-------------|----------------------------|
| Internal highest operating frequency |             | 3 000 Mhz                  |
| Power                                | Rated Power | DC 5 V                     |
|                                      | Test Power  | AC 230 V, 50 Hz            |
| Ports                                | I/O Port    | RJ-12 1 EA                 |
|                                      | Unused Port | N/A                        |
| Components                           |             | Main Body 1 EA, Cable 1 EA |



|                                       | SLA-F4780VA                                                                                                                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Video</b>                          |                                                                                                                                                                                                                         |
| Imaging Device                        | 1/2.8" CMOS                                                                                                                                                                                                             |
| Resolution                            | None                                                                                                                                                                                                                    |
| Max. Framerate                        | None                                                                                                                                                                                                                    |
| NETD                                  | None                                                                                                                                                                                                                    |
| Pixel Size                            | None                                                                                                                                                                                                                    |
| Video Out                             | None                                                                                                                                                                                                                    |
| Video Transmission Distance           | None                                                                                                                                                                                                                    |
| <b>Lens</b>                           |                                                                                                                                                                                                                         |
| Focal Length (Zoom Ratio)             | 4.72mm fixed focal                                                                                                                                                                                                      |
| Optical Zoom                          | None                                                                                                                                                                                                                    |
| Max. Aperture Ratio                   | F2.07                                                                                                                                                                                                                   |
| Angular Field of View                 | H: 70°, V: 50°, D: 96°                                                                                                                                                                                                  |
| Min. Object Distance                  | 0.5m(1.64ft)                                                                                                                                                                                                            |
| Focus Control                         | Fixed                                                                                                                                                                                                                   |
| Lens Type                             | None                                                                                                                                                                                                                    |
| Mount Type                            | RJ12 connected with main unit                                                                                                                                                                                           |
| Optional Lens                         | None                                                                                                                                                                                                                    |
| <b>Environmental &amp; Electrical</b> |                                                                                                                                                                                                                         |
| Operating Temperature / Humidity      | -10°C~+55°C(+14°F~+131°F) / 0~95%RH(non-condensing)                                                                                                                                                                     |
| Storage Temperature / Humidity        | -50°C~+60°C(-58°F~+140°F) / 0~90% RH                                                                                                                                                                                    |
| Wind Load                             | None                                                                                                                                                                                                                    |
| EPA(Effective Projected Area)         | None                                                                                                                                                                                                                    |
| Certification                         | None                                                                                                                                                                                                                    |
| Input Voltage                         | DC 5V/0.25A                                                                                                                                                                                                             |
| Power Consumption                     | 1.25W                                                                                                                                                                                                                   |
| <b>Mechanical</b>                     |                                                                                                                                                                                                                         |
| Color / Material                      | Black / Plastic, Metal                                                                                                                                                                                                  |
| RAL Code                              | RAL9005                                                                                                                                                                                                                 |
| Product Dimensions / Weight           | Lens: 30(W)x20.5(H)x45mm(1.18x0.81x1.77"), 44.4g(0.1lb)<br>Cable: 8m(26.2ft)                                                                                                                                            |
| Compatible Conduit hole / Gasket      | None                                                                                                                                                                                                                    |
| <b>Certifications &amp; Standards</b> |                                                                                                                                                                                                                         |
| Network                               | None                                                                                                                                                                                                                    |
| EMC                                   | FCC 47 CFR 15 Subpart B Class A<br>ICES-3(A)/NMB-3(A)<br>CE/UKCA<br>- EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3<br>VCCI CISPR 32 Class A<br>RCM AS/NZS CISPR 32 Class A<br>KS C 9832 Class A , KS C 9835 |
| Safety                                | UL 62368-1, CAN/CSA C22.2 NO. 62368-1                                                                                                                                                                                   |
| Video                                 | None                                                                                                                                                                                                                    |



## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 230 V, 50 Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description | Model Number | Serial Number | Manufacturer                                | Remarks |
|-------------|--------------|---------------|---------------------------------------------|---------|
| LENS MODULE | SLA-F4780VA  | -             | HANWHA VISION<br>VIETNAM COMPANY<br>LIMITED | EUT     |

## 1.5 Support Equipments

| Description               | Model Number | Serial Number | Manufacturer                                     | Remarks |
|---------------------------|--------------|---------------|--------------------------------------------------|---------|
| NETWORK CAMERA<br>Adapter | 2ACB022F     | -             | Channel Well Technology<br>(Guangzhou) Co., Ltd. | -       |
| NETWORK CAMERA            | PNM-C20000QB | -             | HANWHA VISION VIETNAM<br>COMPANY LIMITED         | -       |
| Laptop                    | P95G001      | 9JM8HT2       | DELL INC.                                        | -       |
| Laptop Adatper            | LA65NS2-01   | -             | LITE-ON TECHNOLOGY<br>(CHANGZHOU)CO., LTD.       | -       |

## 1.6 External I/O Cabling

| Start                |          | END                |          | Cable Spec. |        |
|----------------------|----------|--------------------|----------|-------------|--------|
| Description          | I/O Port | Description        | I/O Port | Length      | Shield |
| LENS MODULE<br>(EUT) | RJ-12    | PoE Switch         | RJ-12    | 8.0         | S      |
| Laptop               | DC Jack  | Laptop<br>Aapter   | DC Jack  | 1.4         | S      |
|                      | RJ-45    | PoE Switch         | RJ-45    | 1.5         | U      |
| PoE Switch           | DC IN    | PoE Switch Adapter | 2 Pin    | 1.2         | U      |

\* Unshielded=U, Shielded=S

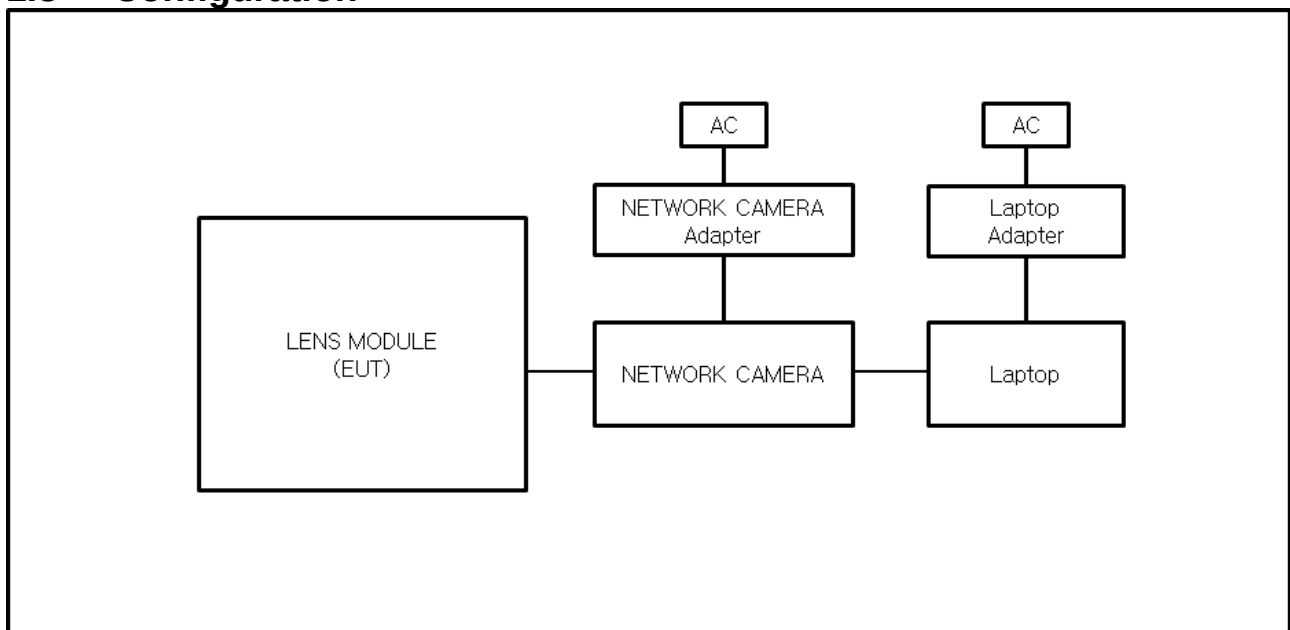


## 1.7 EUT Operating Mode(s)

- Check the network behavior of the EUT with the laptop's ping test.
- View images of the camera through the Web Viewer.

| EUT Test operating S/W |         |                                          |
|------------------------|---------|------------------------------------------|
| Name                   | Version | Manufacture Company                      |
| Web Viewer             | -       | HANWHA VISION VIETNAM<br>COMPANY LIMITED |

## 1.8 Configuration



**1.9 Remarks when standards applied**

N/A

**1.10 Calibration Details of Equipment Used for Measurement**

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

**1.11 Test Facility**

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

**1.12 Laboratory Accreditations and Listings**

| Country       | Agency  | Scope of Accreditation                                                                                                                  | Logo                                                                                                                           |
|---------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| KOREA         | RRA     | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KR0100                                  |
| International | KOLAS   | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KT489                                  |
| USA           | FCC     | 3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.                                            | <br>KR0100                                |
| Canada        | ISED    | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                | <br>23298                                 |
| JAPAN         | VCCI    | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)                                                                          | <br>C-20136, T-20137,<br>R-20181, G-20176 |
| Europe        | TÜV SÜD | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>CARAT 001633 0008                     |



## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A1:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A1:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011/A1:2014

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A2:2021



## 2.1 Conducted Emissions at Mains Power Ports

**Test Date**

Jun. 10, 2025

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                                | Description              | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test SW              | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESR3         | R & S        | 101783        | 11, 06, 2025 |
| <input checked="" type="checkbox"/> | LISN                     | ENV216       | R & S        | 101786        | 01, 09, 2026 |
| <input checked="" type="checkbox"/> | ARTIFICIAL MAINS NETWORK | ESH2-Z5      | R & S        | 100450        | 11, 06, 2025 |
| <input checked="" type="checkbox"/> | PULSE LIMITER            | ESH3-Z2      | R & S        | 101915        | 11, 06, 2025 |

**Test Conditions**

Temperature: (23,6 ± 0,1) °C

Relative Humidity: (46,8 ± 0,1) % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.



## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                     | Description              | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|--------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W             | EMC32        | R & S        | 9.12.00       | -            |
| <input type="checkbox"/> | EMI TEST RECEIVER        | ESR3         | R & S        | 101783        | 11, 06, 2025 |
| <input type="checkbox"/> | LISN                     | ENV216       | R & S        | 101786        | 01, 09, 2026 |
| <input type="checkbox"/> | ARTIFICIAL MAINS NETWORK | ESH2-Z5      | R & S        | 100450        | 11, 06, 2025 |
| <input type="checkbox"/> | PULSE LIMITER            | ESH3-Z2      | R & S        | 101915        | 11, 06, 2025 |
| <input type="checkbox"/> | 8-WIRE ISN CAT6          | NTFM 8158    | SCHWARZBECK  | 8158-0029     | 01, 09, 2026 |

**Test Conditions**

Temperature: (    ±    ) °C

Relative Humidity: (    ±    ) % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

**Remarks**Not tested because there is no communication port.



## 2.3 Radiated Electric Field Emissions(Below 1 GHz)

**Test Date**

Jun. 12, 2025

**Test Location**☒ SEMI ANECHOIC CHAMBER #4(10m)**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | R & S            | 100551        | 02, 13, 2026 |
| <input checked="" type="checkbox"/> | AMPLIFIER         | SCU 01       | R & S            | 100603        | 11, 06, 2025 |
| <input checked="" type="checkbox"/> | BILOG ANTENNA     | VULB 9168    | SCHWARZBECK      | 9168-461      | 05, 09, 2026 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 6806.17.A    | HUBER+SUHNER     | -             | 02, 13, 2026 |

**Test Conditions**

Temperature: (23,6 ± 0,2) °C

Relative Humidity: (46,0 ± 0,2) % R.H.

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.



## 2.4 Radiated Electric Field Emissions(Above 1 GHz)

**Test Date**

Jun. 11, 2025

**Test Location**

SEMI ANECHOIC CHAMBER #5

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test SW       | ES10/RE      | TOYO Corporation | 2022.01.000   | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | Rohde & Schwarz  | 100552        | 02, 13, 2026 |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | BBHA 9120D   | SCHWARZBECK      | 9120D-1802    | 11, 04, 2025 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER      | 8449B        | HP               | 3008A00538    | 04, 30, 2025 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 8491B        | HP               | 23094         | 02, 13, 2026 |

**Test Conditions**

Temperature: (23,5 ± 0,2) °C

Relative Humidity: (46,5 ± 0,2) % R.H.

**Frequency Range of Measurement**

1 GHz to 6 GHz

**Instrument Settings**

IF Band Width: 1 MHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**

- See Appendix A for test data.  
- The Average of the test data is the cispr average result.



## 2.5 Harmonic Current Emissions

**Test Date**

Jun. 13, 2025

**Test Location**

Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test SW            | net.control  | EM TEST      | 2.1.4         | -            |
| <input checked="" type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 03, 31, 2026 |
| <input checked="" type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

**Test Conditions**

Temperature: (23,3 ± 0,1) °C

Relative Humidity: (46,8 ± 0,1) % R.H.

**Classification of Equipment for Harmonic Current Emissions**

- ☒ Class A  
☐ Class B  
☐ Class C(Below 25 W)  
☐ Class C(Above 25 W)  
☐ Class D

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.



## 2.6 Voltage Fluctuations and Flicker

**Test Date**

Jun. 13, 2025

**Test Location**

Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test SW            | net.control  | EM TEST      | 2.1.4         | -            |
| <input checked="" type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 03, 31, 2026 |
| <input checked="" type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

**Test Conditions**

Temperature: (23,3 ± 0,2) °C

Relative Humidity: (46,8 ± 0,2) % R.H.

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.



### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011/A1 :2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard:

Immunity requirements for components of fire, intruder and social alarm systems

**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 is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

#### **Radiated electromagnetic fields**

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 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 picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to 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.



### **Fast transient burst / 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 discharge is permissible, providing

That there is no residual 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.

### **Conducted RF immunity**

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 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 oeuvres at  $U = 130 \text{ dB}\mu\text{V}$ .

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at  $U = 140 \text{ dB}\mu\text{V}$ , 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  $U = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at  $U = 120 \text{ dB}\mu\text{V}$ .

### **Voltage dip/interruption / Voltage variation**

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, after the conditioning.



### 3.1 Electrostatic Discharge

**Reference Standard**

EN 61000-4-2

**Test Date**

Jun. 10, 2025

**Test Location**

EMS-ESD: Electro wave Shieldroom #6

**Test Equipment**

| Used                                | Description   | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | ESD SIMULATOR | ESS-2000     | Noise Ken    | ESS01Z0454    | 01, 21, 2026 |
| <input checked="" type="checkbox"/> | HCP           | -            | KES          | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | Noise Ken    | -             | -            |

**Test Conditions**

Temperature: (23,6 ± 0,1) °C  
Relative Humidity: (46,8 ± 0,1) % R.H.  
Atmospheric Pressure: (100,1 ± 0,1) kPa

**Test Specifications**

Discharge Factor: ≥ 1 s  
Discharge Impedance: 330 ohm / 150 pF  
Kind of Discharge: Air, Contact (direct and indirect)  
Polarity: Positive and Negative  
Number of Discharge: 10 at all locations for Air discharge  
10 at all locations for Contact discharge

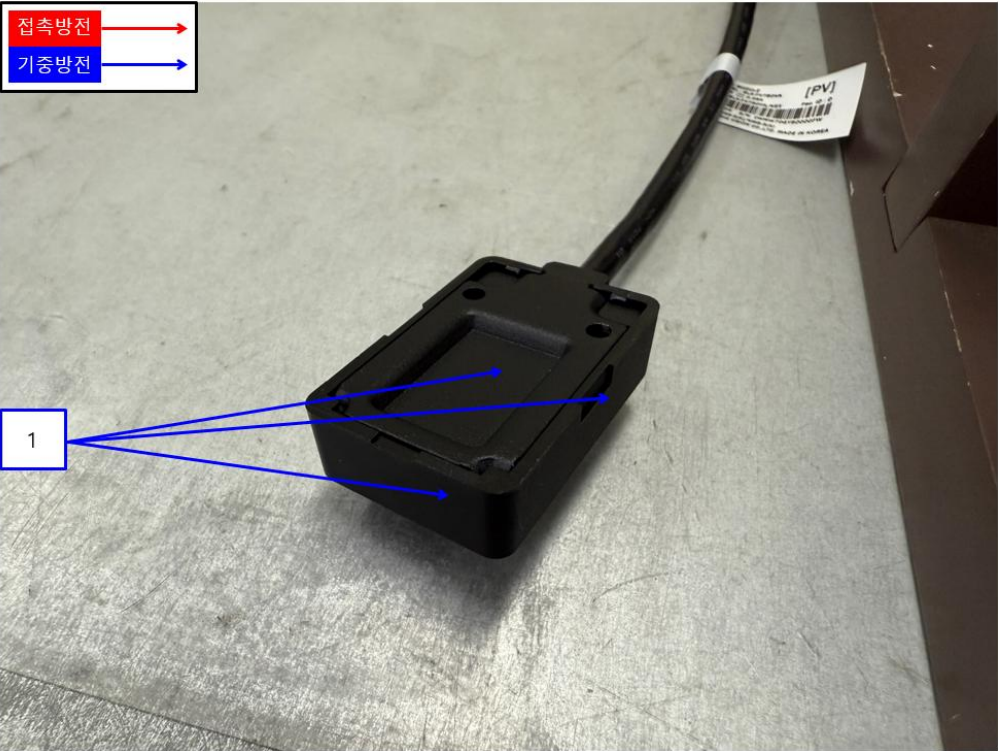
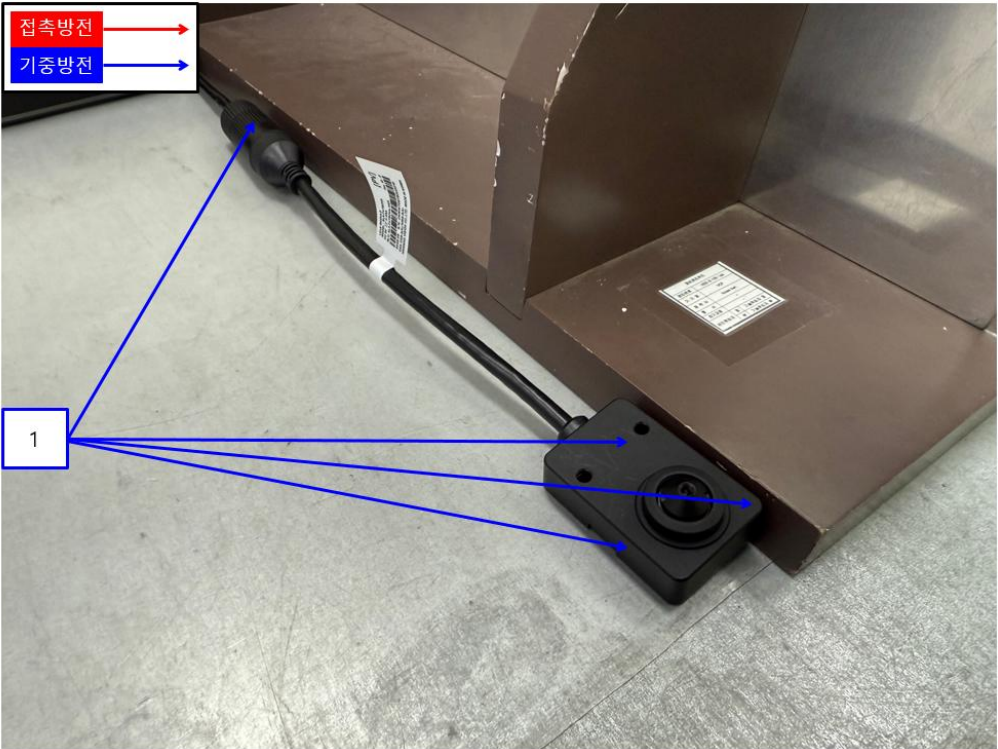
|                    |                                          |                                          |                                          |                                          |
|--------------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| Discharge Voltage: | Contact                                  | Air                                      | HCP                                      | VCP                                      |
|                    | <input type="checkbox"/> 2 kV            | <input checked="" type="checkbox"/> 2 kV | <input type="checkbox"/> 2 kV            | <input type="checkbox"/> 2 kV            |
|                    | <input type="checkbox"/> 4 kV            | <input checked="" type="checkbox"/> 4 kV | <input type="checkbox"/> 4 kV            | <input type="checkbox"/> 4 kV            |
|                    | <input checked="" type="checkbox"/> 6 kV | <input type="checkbox"/> 6 kV            | <input checked="" type="checkbox"/> 6 kV | <input checked="" type="checkbox"/> 6 kV |
|                    | <input type="checkbox"/> 8 kV            | <input checked="" type="checkbox"/> 8 kV | <input type="checkbox"/> 8 kV            | <input type="checkbox"/> 8 kV            |
|                    | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           |

Notes: HCP: Horizontal coupling plane  
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied



Location of Discharge:



**Test Data**

| No. | Test Point  | Discharge Method  | Observations | Remarks |
|-----|-------------|-------------------|--------------|---------|
| 1   | HCP Contact | Contact Discharge | Complied     | -       |
| 2   | VCP Contact | Contact Discharge | Complied     | -       |

**Direct Discharge**

| No. | Test Point | Discharge Method | Observations | Remarks |
|-----|------------|------------------|--------------|---------|
| 1   | Enclosure  | Air Discharge    | Complied     | -       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.2 Radiated Electric Field Immunity

**Reference Standard**

EN IEC 61000-4-3

**Test Date**

Jun. 13, 2025

**Test Location**EMS-RS: ☒ SEMI ANECHOIC CHAMBER #3☐ SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

| Used                                | Description                     | Model Number | Manufacturer    | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------------|--------------|-----------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W                    | EMC32        | R & S           | 10.10.02      | -            |
| <input checked="" type="checkbox"/> | SIGNAL GENERATOR                | SMB 100A     | Rohde & Schwarz | 108252        | 07, 29, 2025 |
| <input checked="" type="checkbox"/> | HIGH POWER DUAL AMP             | SSA532       | SUNGSAN         | SSA532-001    | -            |
| <input checked="" type="checkbox"/> | POWER METER                     | E4419B       | Agilent         | GB40203000    | 02, 13, 2026 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY52170007    | 02, 13, 2026 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY41498669    | 02, 13, 2026 |
| <input checked="" type="checkbox"/> | STACKED DOUBLE LOG-PER- ANTENNA | STPL9128 E   | Schwarzbeck     | 9128ES-121    | -            |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA      | SAS-571      | A.H.SYSTEM,INC  | 781           | 03, 05, 2026 |

**Test Conditions**

Temperature: (23,4 ± 0,2) °C  
Relative Humidity: (46,0 ± 0,2) % R.H.  
Atmospheric Pressure: (100,1 ± 0,1) kPa



### Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m  
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz  
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave  
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

**Test Data**

| Side Exposed | Observations |          |
|--------------|--------------|----------|
|              | Horizontal   | Vertical |
| Front        | Complied     | Complied |
| Right        | Complied     | Complied |
| Back         | Complied     | Complied |
| Left         | Complied     | Complied |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.3 Electrical Fast Transients/Bursts

**Reference Standard**

EN 61000-4-4

**Test Date**

Jun. 11, 2025

**Test Location**

EMS-EFT: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | iec.control  | EM TEST      | 5.4.8         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR   | UCS 500N7    | EM TEST      | P1608172950   | 11, 06, 2025 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC              | MV2616       | EM TEST      | P1552169719   | 11, 07, 2025 |
| <input checked="" type="checkbox"/> | CAPACITIVE COUPLING CLAMP | HFK          | EM TEST      | P1633183115   | 11, 06, 2025 |

**Test Conditions**

Temperature: (23,7 ± 0,2) °C  
Relative Humidity: (46,5 ± 0,2) % R.H.  
Atmospheric Pressure: (99,8 ± 0,1) kPa

**Test Specifications**

Pulse Amplitude & Polarity:  
(AC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV  
☐ ± 4.0 kV

Pulse Amplitude & Polarity:  
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV  
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

**Test Data**☒ Input a.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| L                   | Complied       | Complied       |
| N                   | Complied       | Complied       |
| L – N               | Complied       | Complied       |

☐ Input d.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| RJ-12               | Complied       | Complied       |

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

**Test Results**☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**PASS Required Performance Criteria



### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5

**Test Date**

Jun. 11, 2025

**Test Location**

EMS-Surge: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description                | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|----------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W               | iec.control  | EM TEST      | 5.4.8         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT<br>SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 07, 2025 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC               | MV2616       | EM TEST      | P1552169719   | 11, 07, 2025 |

**Test Conditions**

Temperature: (23,7 ± 0,2) °C  
Relative Humidity: (46,5 ± 0,2) % R.H.  
Atmospheric Pressure: (99,8 ± 0,1) kPa



### Test Specifications

#### AC Power Lines

Source Impedance: 12 ohm for common Mode and 2 ohm for differential Mode

Surge Amplitude :  
Common Mode  
☐ (0,5 / 1,0 / 2,0) kV  
Differential Mode  
☒ (0,5 / 1,0) kV

Number of Surges: ☒ 5 surges per angle

Angle: ☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity: ☒ Positive & Negative

Repetition Rate: ☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

#### Other supply / Signal Lines

Source Impedance: 42 ohm for common Mode

Surge Amplitude: Common Mode  
☐ (0,5 / 1,0) kV

Number of Surges: ☐ 5 Surges

Polarity: ☐ Positive & Negative

Repetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☐ Complied

**Test Data**☒ Line to Line – Differential Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| L – N               | Complied       | Complied       |

☐ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

**Signal Lines**☐ Line to Earth – Common Mode

| Mode of Application | Coupling Method | Observations   |                |
|---------------------|-----------------|----------------|----------------|
|                     |                 | (+) Surge (kV) | (-) Surge (kV) |
| -                   | CDN             | -              | -              |
|                     | LINE            | -              | -              |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**PASS Required Performance Criteria



### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6

**Test Date**

Jun. 11, 2025

**Test Location**

EMS-CS: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description                            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|----------------------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W                           | icd.control  | EM TEST      | 8.0.0         | -            |
| <input checked="" type="checkbox"/> | TEST SYSTEM FOR CONDUCTED AND RADIATED | NSG4070      | TESEQ        | 65585         | 11, 18, 2025 |
| <input checked="" type="checkbox"/> | ATTENUATOR                             | ATT 6/80     | EM TEST      | P1614178148   | 11, 06, 2025 |
| <input checked="" type="checkbox"/> | CDN                                    | CDN M016     | TESEQ        | 43694         | 11, 07, 2025 |
| <input checked="" type="checkbox"/> | CDN                                    | CDN M016     | TESEQ        | 43697         | 11, 07, 2025 |
| <input type="checkbox"/>            | CDN                                    | CDN T8RJ45   | EM TEST      | 0909-09       | 07, 29, 2025 |
| <input checked="" type="checkbox"/> | EM CLAMP                               | KEMZ 801A    | TESEQ        | 44099         | 11, 08, 2025 |

**Test Conditions**

Temperature: (23,7 ± 0,1) °C  
Relative Humidity: (46,5 ± 0,1) % R.H.  
Atmospheric Pressure: (99,8 ± 0,1) kPa

**Test Specifications**

Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms  
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 kHz sine wave  
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

Required Performance Criteria: ☒ Complied

**Test Data**☒ Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| L – N                                | CDN             | Complied     |

☐ Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| -                                    | -               | -            |

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| RJ-12                                | Clamp           | Complied     |

Notes: CDN = Coupling Decoupling Network  
"blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**

PASS Required Performance Criteria



### 3.6 Voltage Dips and Short Interruptions

**Reference Standard**

EN IEC 61000-4-11

**Test Date**

Jun. 11, 2025

**Test Location**

EMS-Voltage dip: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description                | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|----------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W               | iec.control  | EM TEST      | 5.4.8         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT<br>SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 07, 2025 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC               | MV2616       | EM TEST      | P1552169719   | 11, 07, 2025 |

**Test Conditions**

Temperature: (23,7 ± 0,1) °C  
Relative Humidity: (46,5 ± 0,1) % R.H.  
Atmospheric Pressure: (99,8 ± 0,1) kPa

**Test Specifications & Observations/Remarks****- Voltage Dips and Short Interruptions**

| <u>Test Level</u>                             | <u>Duration [in period/ms (50 Hz)]</u>          | <u>Results</u>     |
|-----------------------------------------------|-------------------------------------------------|--------------------|
| <input checked="" type="checkbox"/> 20 % dip  | <input checked="" type="checkbox"/> 250 / 5 000 | <u>Complied</u>    |
| <input checked="" type="checkbox"/> 30 % dip  | <input checked="" type="checkbox"/> 25 / 500    | <u>Complied</u>    |
| <input checked="" type="checkbox"/> 60 % dip  | <input checked="" type="checkbox"/> 10 / 200    | <u>Complied</u>    |
| <input checked="" type="checkbox"/> 100 % dip | <input checked="" type="checkbox"/> 250 / 5 000 | <u>Degradation</u> |

**- Voltage variations**

|                                                 |                                                  |                 |
|-------------------------------------------------|--------------------------------------------------|-----------------|
| <input checked="" type="checkbox"/> Unom + 10 % | <input checked="" type="checkbox"/> 253.0 V (ac) | <u>Complied</u> |
| <input checked="" type="checkbox"/> Unom - 15 % | <input checked="" type="checkbox"/> 195.5 V (ac) | <u>Complied</u> |

**Observations:**

Complied – No degradation of function

Degradation - See "Remarks "

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria  
☐ NOT APPLICABLE

**Remarks**

During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered without operator's intervention.

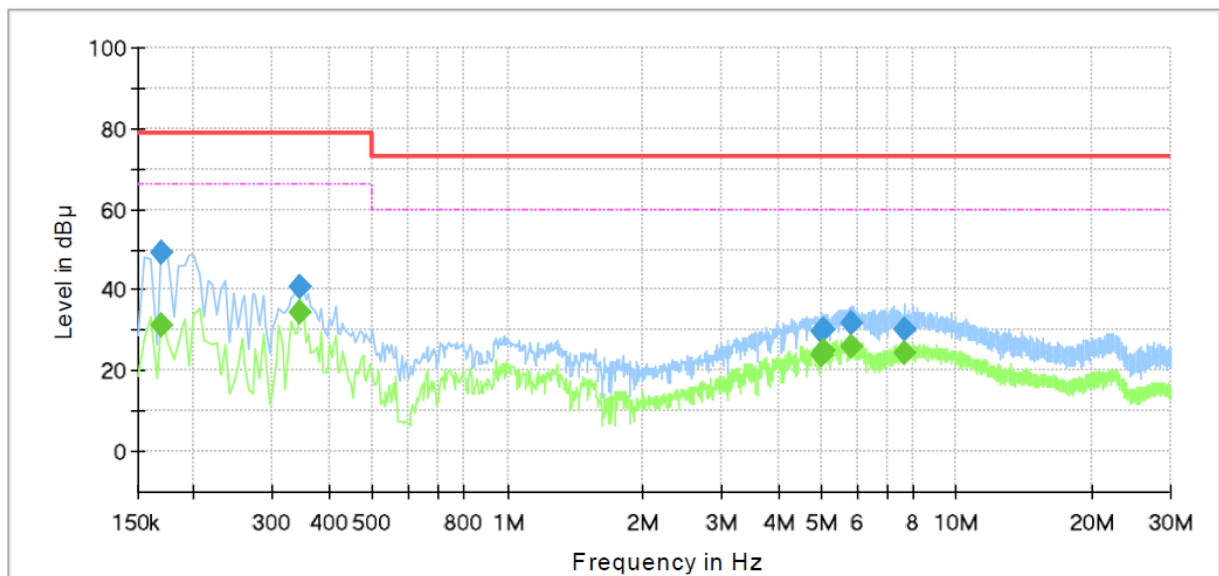


## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

[HOT]

Test Description: Conducted Emission  
Job No.: KES-EM252039  
Phase: L  
Mode:  
Operator Name: KES

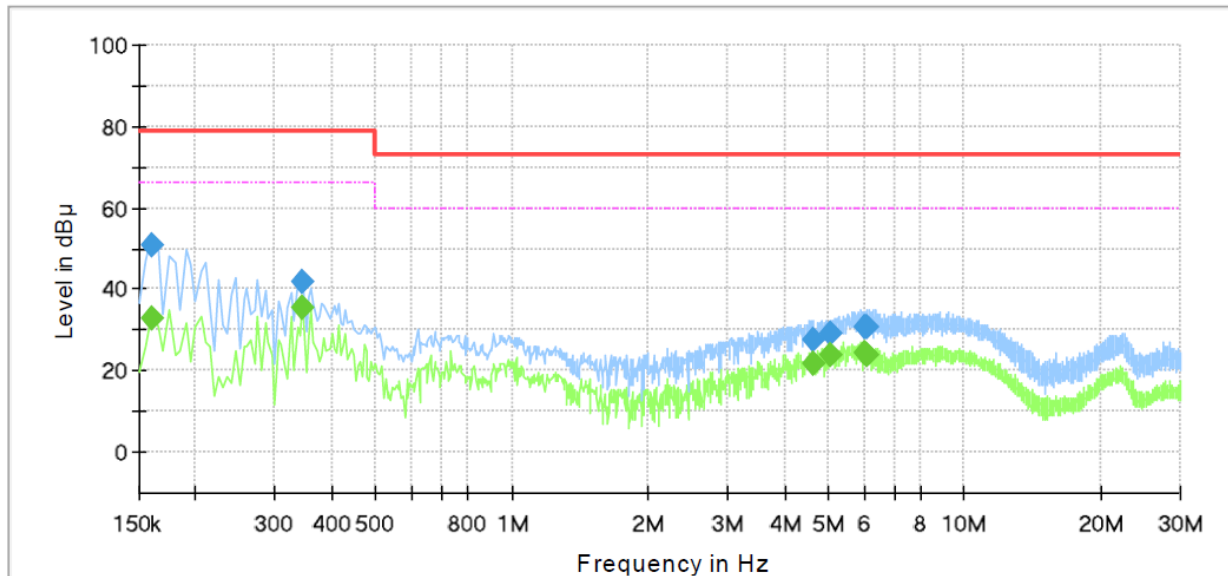


### Final\_Result

| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | CAverage (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------------|-----------------------|--------------------|-------------|-----------------|-----------------|------|------------|
| 0.170000        | ---                    | 31.08                 | 66.00              | 34.92       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.170000        | 49.02                  | ---                   | 79.00              | 29.98       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.345000        | ---                    | 34.27                 | 66.00              | 31.73       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.345000        | 41.02                  | ---                   | 79.00              | 37.98       | 1000.0          | 9.000           | L1   | 19.6       |
| 4.980000        | ---                    | 24.03                 | 60.00              | 35.97       | 1000.0          | 9.000           | L1   | 19.9       |
| 4.980000        | 29.88                  | ---                   | 73.00              | 43.12       | 1000.0          | 9.000           | L1   | 19.9       |
| 5.035000        | ---                    | 24.89                 | 60.00              | 35.11       | 1000.0          | 9.000           | L1   | 19.9       |
| 5.035000        | 30.24                  | ---                   | 73.00              | 42.76       | 1000.0          | 9.000           | L1   | 19.9       |
| 5.835000        | ---                    | 26.02                 | 60.00              | 33.98       | 1000.0          | 9.000           | L1   | 20.0       |
| 5.835000        | 31.68                  | ---                   | 73.00              | 41.32       | 1000.0          | 9.000           | L1   | 20.0       |
| 7.625000        | ---                    | 24.51                 | 60.00              | 35.49       | 1000.0          | 9.000           | L1   | 20.0       |
| 7.625000        | 30.14                  | ---                   | 73.00              | 42.86       | 1000.0          | 9.000           | L1   | 20.0       |

**[NEUTRAL]**

Test Description: Conducted Emission  
Job No.: KES-EM252039  
Phase: N  
Mode:  
Operator Name: KES

**Final\_Result**

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.160000        | ---              | 32.89           | 66.00        | 33.11       | 1000.0          | 9.000           | N    | 19.5       |
| 0.160000        | 50.70            | ---             | 79.00        | 28.30       | 1000.0          | 9.000           | N    | 19.5       |
| 0.345000        | ---              | 35.34           | 66.00        | 30.66       | 1000.0          | 9.000           | N    | 19.5       |
| 0.345000        | 42.05            | ---             | 79.00        | 36.95       | 1000.0          | 9.000           | N    | 19.5       |
| 4.640000        | ---              | 21.58           | 60.00        | 38.42       | 1000.0          | 9.000           | N    | 19.8       |
| 4.640000        | 27.41            | ---             | 73.00        | 45.59       | 1000.0          | 9.000           | N    | 19.8       |
| 5.070000        | ---              | 23.89           | 60.00        | 36.11       | 1000.0          | 9.000           | N    | 19.9       |
| 5.070000        | 28.98            | ---             | 73.00        | 44.02       | 1000.0          | 9.000           | N    | 19.9       |
| 5.990000        | ---              | 24.18           | 60.00        | 35.82       | 1000.0          | 9.000           | N    | 19.9       |
| 5.990000        | 30.71            | ---             | 73.00        | 42.29       | 1000.0          | 9.000           | N    | 19.9       |
| 6.070000        | ---              | 24.05           | 60.00        | 35.95       | 1000.0          | 9.000           | N    | 19.9       |
| 6.070000        | 30.60            | ---             | 73.00        | 42.40       | 1000.0          | 9.000           | N    | 19.9       |

**◆ Calculation**

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))



## Conducted Emissions at Telecommunication Ports

[1 000 Mbps]

N/A

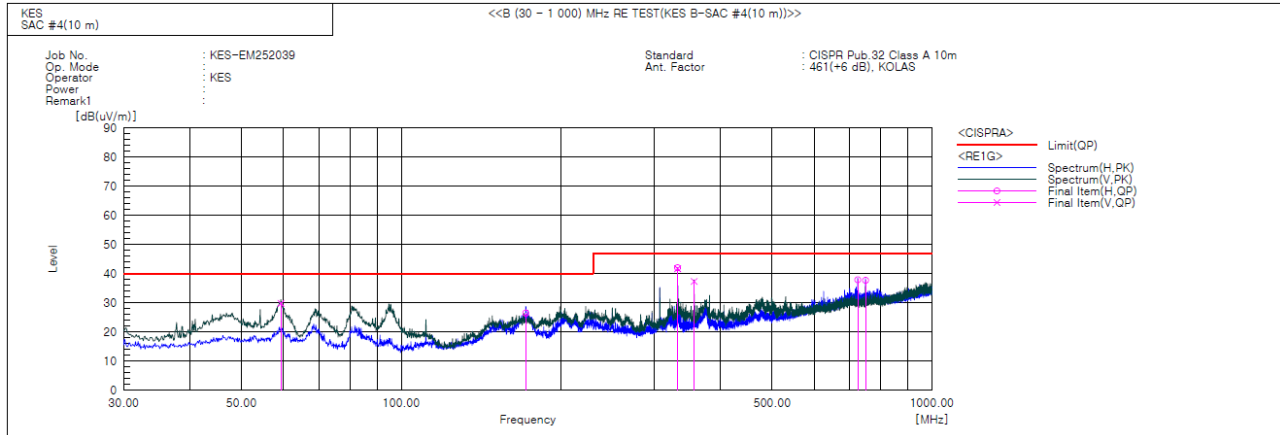
### ◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Radiated Electric Field Emissions(Below 1 GHz)****Final Result**

| No. | Frequency [MHz] | (P) | Reading QP [dB(μV)] | c.f [dB(1/m)] | Result QP [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 59.343          | V   | 51.1                | -21.3         | 29.8                 | 40.0                | 10.2           | 124.0       | 288.0       |        |
| 2   | 171.741         | H   | 46.6                | -20.1         | 26.5                 | 40.0                | 13.5           | 351.0       | 49.0        |        |
| 3   | 331.791         | V   | 57.7                | -16.0         | 41.7                 | 47.0                | 5.3            | 176.0       | 280.0       |        |
| 4   | 331.791         | H   | 58.0                | -16.0         | 42.0                 | 47.0                | 5.0            | 278.0       | 68.0        |        |
| 5   | 356.284         | V   | 52.6                | -15.3         | 37.3                 | 47.0                | 9.7            | 163.0       | 149.0       |        |
| 6   | 725.005         | H   | 42.2                | -4.3          | 37.9                 | 47.0                | 9.1            | 219.0       | 343.0       |        |
| 7   | 749.983         | H   | 41.5                | -3.8          | 37.7                 | 47.0                | 9.3            | 112.0       | 349.0       |        |

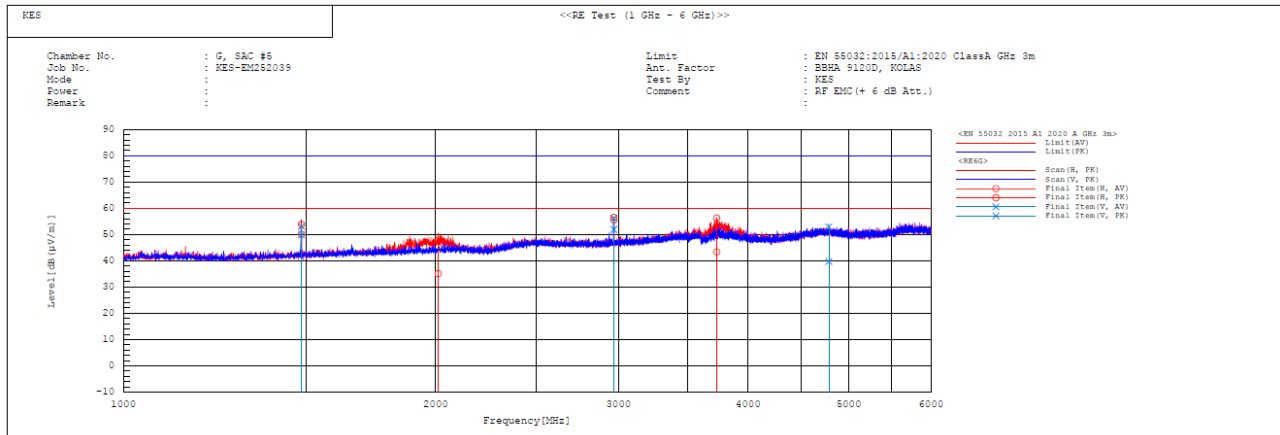
**◆ Calculation**

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

**Radiated Electric Field Emissions(Above 1 GHz)****Final Result**

| No. | Frequency<br>[MHz] | Pol | Reading<br>AV<br>[dB(μV)] | Reading<br>PK<br>[dB(μV)] | c.f<br>[dB(1/m)] | Result<br>PK<br>[dB(μV/m)] | Limit<br>AV<br>[dB(μV/m)] | Limit<br>PK<br>[dB(μV/m)] | Margin<br>AV<br>[dB] | Margin<br>PK<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|---------------------------|------------------|----------------------------|---------------------------|---------------------------|----------------------|----------------------|----------------|----------------|--------|
| 1   | 1484.526           | H   | 49.1                      | 52.9                      | 1.0              | 53.9                       | 60.0                      | 80.0                      | 9.9                  | 26.1                 | 100.0          | 74.9           |        |
| 2   | 1484.868           | V   | 48.8                      | 52.1                      | 1.0              | 53.1                       | 60.0                      | 80.0                      | 10.2                 | 26.9                 | 100.0          | 185.7          |        |
| 3   | 2010.941           | H   | 32.1                      | 44.9                      | 3.0              | 47.9                       | 60.0                      | 80.0                      | 24.9                 | 32.1                 | 100.0          | 145.6          |        |
| 4   | 2969.692           | H   | 49.2                      | 50.2                      | 6.3              | 56.5                       | 60.0                      | 80.0                      | 4.5                  | 23.5                 | 100.0          | 160.1          |        |
| 5   | 2969.998           | V   | 45.6                      | 49.9                      | 6.3              | 56.2                       | 60.0                      | 80.0                      | 8.1                  | 23.8                 | 100.0          | 193.2          |        |
| 6   | 3730.264           | H   | 35.3                      | 48.2                      | 8.1              | 56.3                       | 60.0                      | 80.0                      | 16.6                 | 23.7                 | 100.0          | 157.7          |        |
| 7   | 4785.292           | V   | 28.0                      | 41.2                      | 11.7             | 52.9                       | 60.0                      | 80.0                      | 20.3                 | 27.1                 | 100.0          | 0.6            |        |

**◆ Calculation**

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(PK/CAV) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

| <b>Average harmonic current results</b> |                      |            |           |        |
|-----------------------------------------|----------------------|------------|-----------|--------|
| Hn                                      | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
| 1                                       | 0.054                |            |           |        |
| 2                                       | 0.001                | 0.135      | 1.080     | n/a    |
| 3                                       | 0.047                | 2.045      | 2.300     | PASS   |
| 4                                       | 0.002                | 0.468      | 0.430     | n/a    |
| 5                                       | 0.047                | 4.131      | 1.140     | PASS   |
| 6                                       | 0.002                | 0.508      | 0.300     | n/a    |
| 7                                       | 0.046                | 6.017      | 0.770     | PASS   |
| 8                                       | 0.002                | 0.691      | 0.230     | n/a    |
| 9                                       | 0.043                | 10.790     | 0.400     | PASS   |
| 10                                      | 0.002                | 0.817      | 0.184     | n/a    |
| 11                                      | 0.040                | 12.259     | 0.330     | PASS   |
| 12                                      | 0.001                | 0.949      | 0.153     | n/a    |
| 13                                      | 0.038                | 17.965     | 0.210     | PASS   |
| 14                                      | 0.002                | 1.243      | 0.131     | n/a    |
| 15                                      | 0.035                | 23.061     | 0.150     | PASS   |
| 16                                      | 0.001                | 1.249      | 0.115     | n/a    |
| 17                                      | 0.031                | 23.755     | 0.132     | PASS   |
| 18                                      | 0.001                | 1.373      | 0.102     | n/a    |
| 19                                      | 0.028                | 23.891     | 0.118     | PASS   |
| 20                                      | 0.001                | 1.530      | 0.092     | n/a    |
| 21                                      | 0.025                | 15.657     | 0.161     | PASS   |
| 22                                      | 0.001                | 1.789      | 0.084     | n/a    |
| 23                                      | 0.022                | 14.860     | 0.147     | PASS   |
| 24                                      | 0.001                | 1.915      | 0.077     | n/a    |
| 25                                      | 0.019                | 13.984     | 0.135     | PASS   |
| 26                                      | 0.001                | 2.002      | 0.071     | n/a    |
| 27                                      | 0.016                | 13.062     | 0.125     | PASS   |
| 28                                      | 0.001                | 2.236      | 0.066     | n/a    |
| 29                                      | 0.014                | 11.827     | 0.116     | PASS   |
| 30                                      | 0.001                | 2.289      | 0.061     | n/a    |
| 31                                      | 0.012                | 10.893     | 0.109     | PASS   |
| 32                                      | 0.001                | 2.495      | 0.058     | n/a    |
| 33                                      | 0.010                | 10.008     | 0.102     | PASS   |
| 34                                      | 0.001                | 2.438      | 0.054     | n/a    |
| 35                                      | 0.009                | 9.651      | 0.096     | PASS   |
| 36                                      | 0.001                | 2.639      | 0.051     | n/a    |
| 37                                      | 0.009                | 9.325      | 0.091     | PASS   |
| 38                                      | 0.001                | 2.758      | 0.048     | n/a    |
| 39                                      | 0.008                | 9.243      | 0.087     | PASS   |
| 40                                      | 0.001                | 2.598      | 0.046     | n/a    |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

\* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



## Test Data - Harmonics (continued)

**Maximum harmonic current results**

| Hn | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
|----|----------------------|------------|-----------|--------|
| 1  | 0.056                |            |           |        |
| 2  | 0.002                | 0.103      | 1.620     | n/a    |
| 3  | 0.050                | 1.460      | 3.450     | PASS   |
| 4  | 0.002                | 0.355      | 0.645     | n/a    |
| 5  | 0.049                | 2.888      | 1.710     | PASS   |
| 6  | 0.002                | 0.409      | 0.450     | n/a    |
| 7  | 0.048                | 4.139      | 1.155     | PASS   |
| 8  | 0.002                | 0.541      | 0.345     | n/a    |
| 9  | 0.045                | 7.567      | 0.600     | PASS   |
| 10 | 0.002                | 0.623      | 0.276     | n/a    |
| 11 | 0.043                | 8.600      | 0.495     | PASS   |
| 12 | 0.002                | 0.717      | 0.230     | n/a    |
| 13 | 0.039                | 12.468     | 0.315     | PASS   |
| 14 | 0.002                | 0.960      | 0.197     | n/a    |
| 15 | 0.036                | 15.974     | 0.225     | PASS   |
| 16 | 0.002                | 0.949      | 0.173     | n/a    |
| 17 | 0.033                | 16.421     | 0.199     | PASS   |
| 18 | 0.002                | 1.062      | 0.153     | n/a    |
| 19 | 0.029                | 16.354     | 0.178     | PASS   |
| 20 | 0.002                | 1.147      | 0.138     | n/a    |
| 21 | 0.026                | 15.939     | 0.161     | PASS   |
| 22 | 0.002                | 1.373      | 0.125     | n/a    |
| 23 | 0.022                | 15.064     | 0.147     | PASS   |
| 24 | 0.002                | 1.457      | 0.115     | n/a    |
| 25 | 0.019                | 14.060     | 0.135     | PASS   |
| 26 | 0.002                | 1.548      | 0.106     | n/a    |
| 27 | 0.016                | 13.156     | 0.125     | PASS   |
| 28 | 0.002                | 1.701      | 0.099     | n/a    |
| 29 | 0.014                | 11.901     | 0.116     | PASS   |
| 30 | 0.002                | 1.783      | 0.092     | n/a    |
| 31 | 0.012                | 10.992     | 0.109     | PASS   |
| 32 | 0.002                | 1.919      | 0.086     | n/a    |
| 33 | 0.011                | 10.271     | 0.102     | PASS   |
| 34 | 0.001                | 1.840      | 0.081     | n/a    |
| 35 | 0.010                | 10.020     | 0.096     | PASS   |
| 36 | 0.002                | 1.969      | 0.077     | n/a    |
| 37 | 0.009                | 9.772      | 0.091     | PASS   |
| 38 | 0.001                | 2.027      | 0.073     | n/a    |
| 39 | 0.008                | 9.747      | 0.087     | PASS   |
| 40 | 0.001                | 1.953      | 0.069     | n/a    |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

\* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Voltage Fluctuations

## Maximum Flicker results

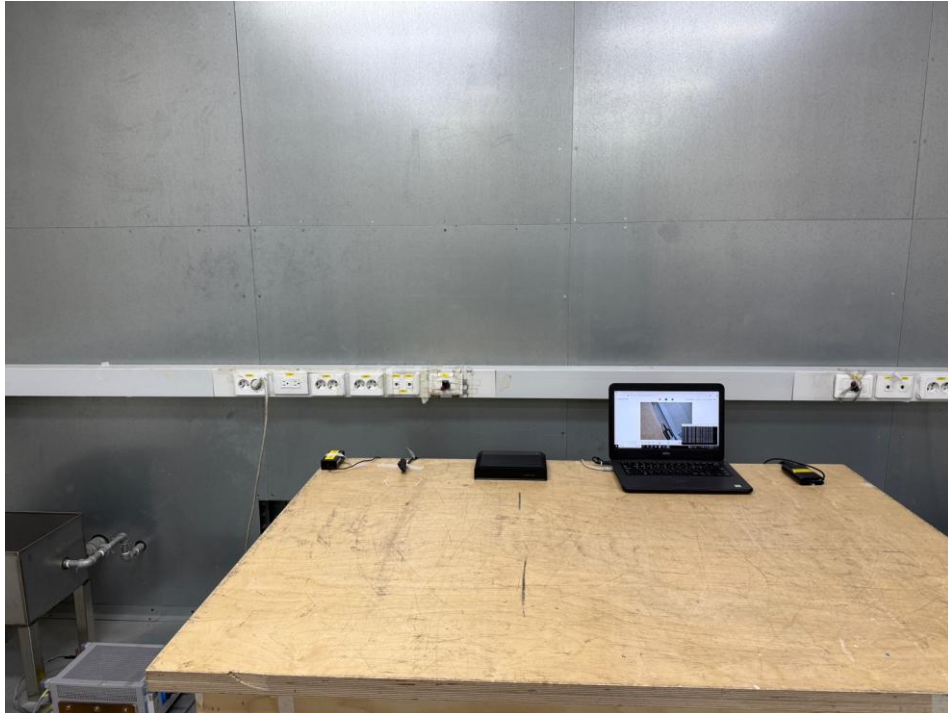
| Flicker Measurements |       |         |        |          |          |
|----------------------|-------|---------|--------|----------|----------|
|                      | Plt   | Max Pst | Max Dc | Max Dmax | Max Tmax |
| Line 1:              | 0.028 | 0.028   | 0      | < 0.2    | 0        |
| Limits:              | 0.65  | 1       | 3.3    | 4        | 0.5      |
| Results:             | PASS  | PASS    | PASS   | PASS     | PASS     |





## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports





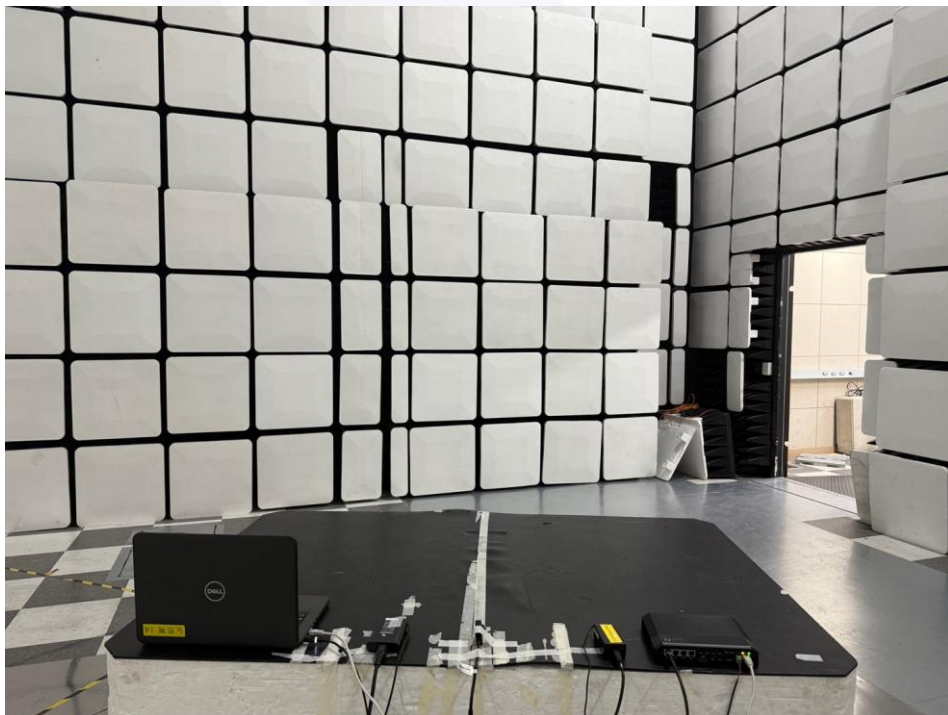
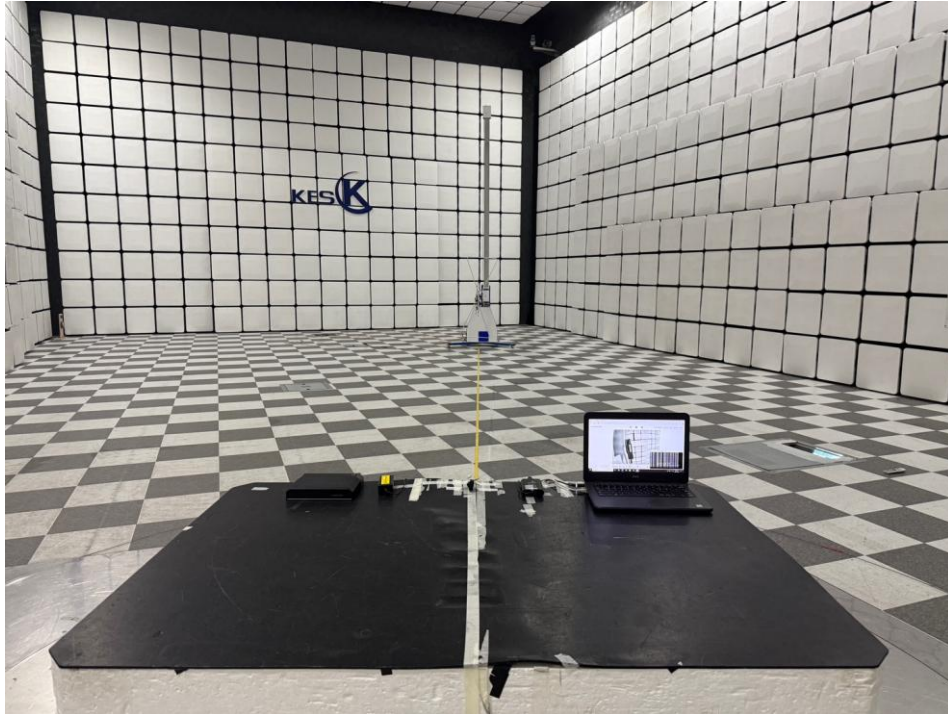
## Conducted Emissions at Telecommunication Ports

N/A



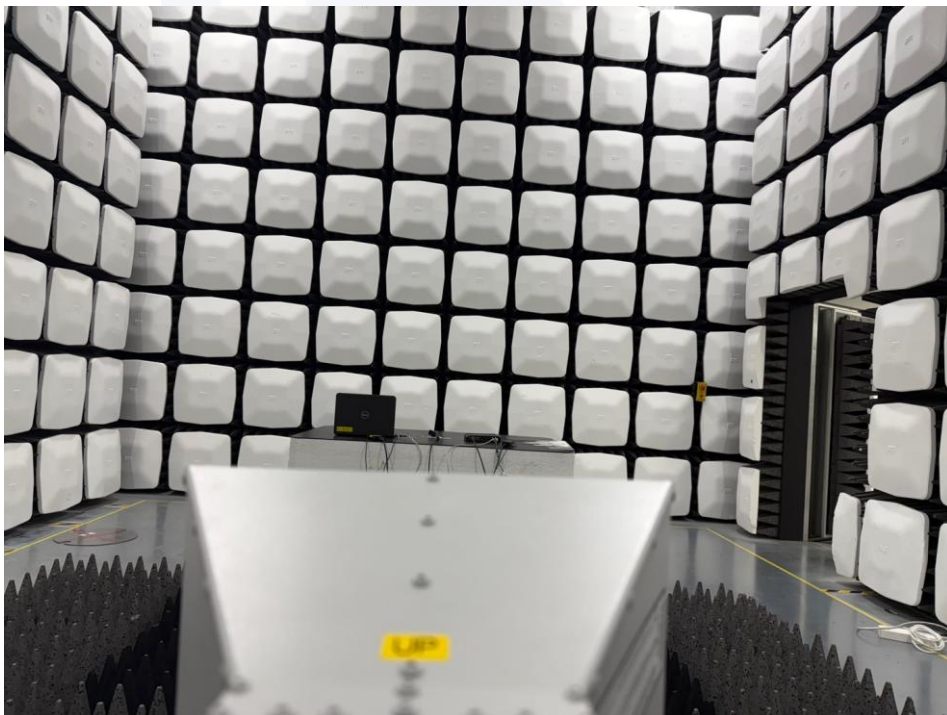
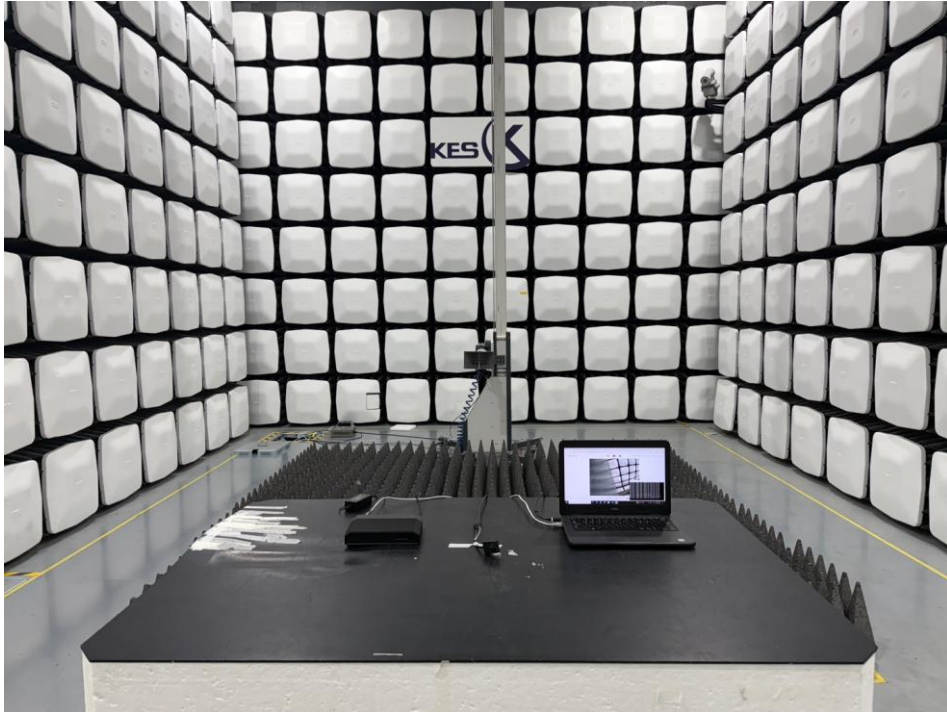


## Radiated Electric Field Emissions(Below 1 GHz)





## Radiated Electric Field Emissions(Above 1 GHz)



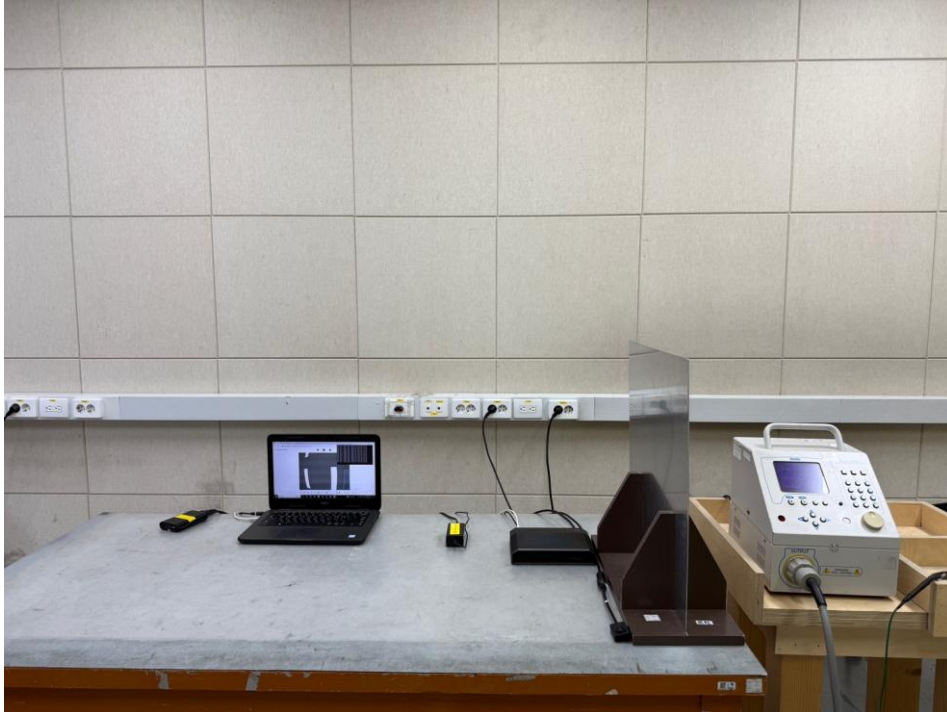


## Harmonic Current Emissions and Voltage Fluctuations and Flicker





## Electrostatic Discharge

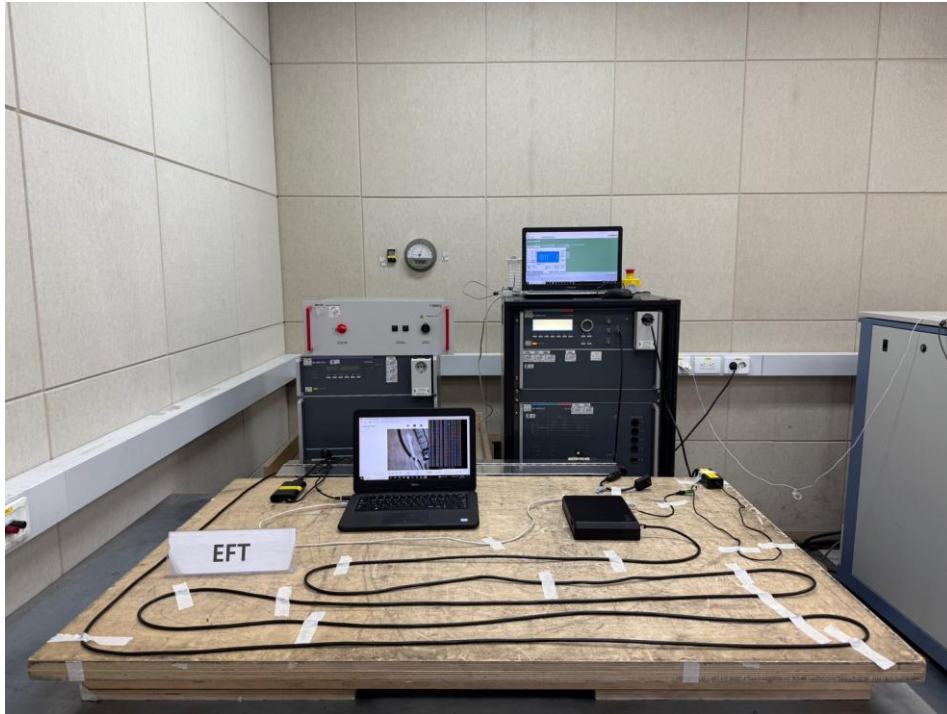


## Radiated Electric Field Immunity





## Electrical Fast Transients/Bursts



## Surge Transients





## Conducted Disturbance



## Voltage Dips and Short Interruptions





## EUT External Photographs

(Top)



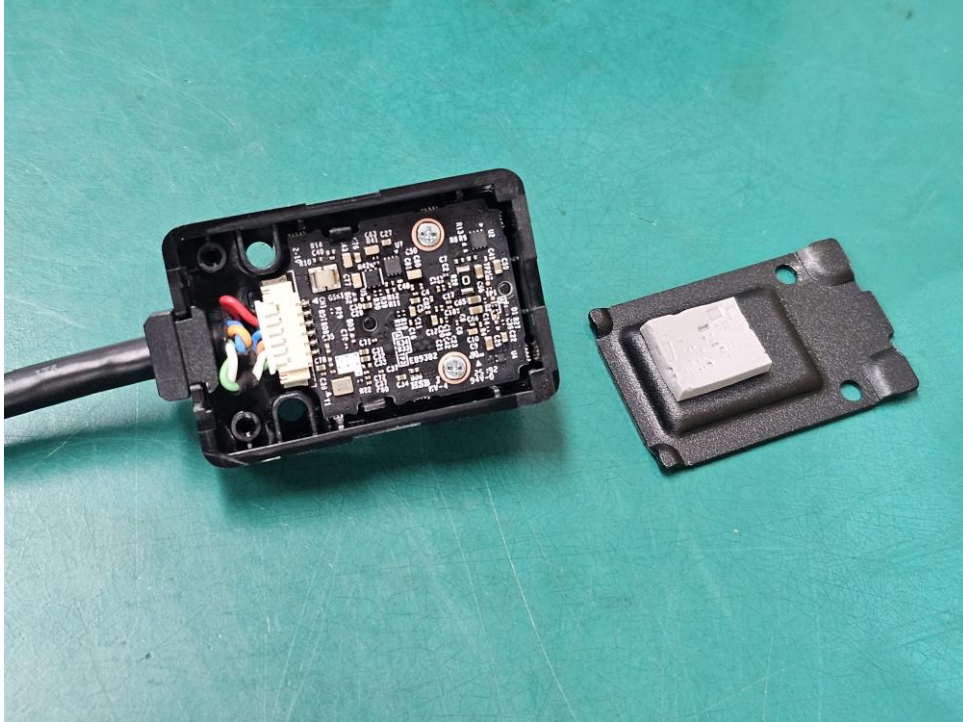
(Bottom)





## EUT Internal Photographs

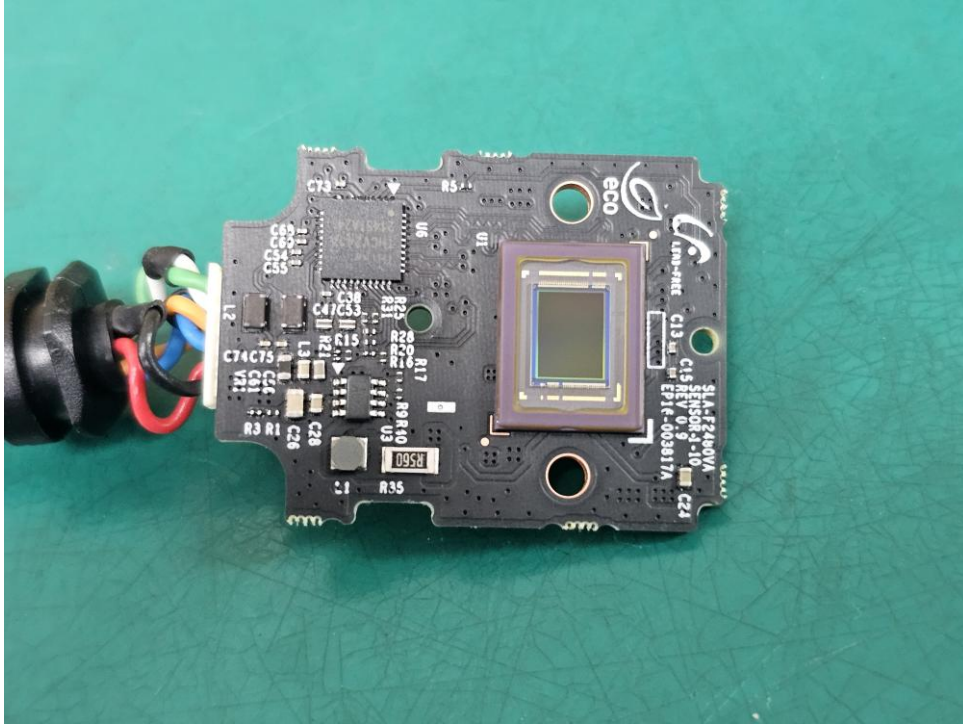
(Internal View)



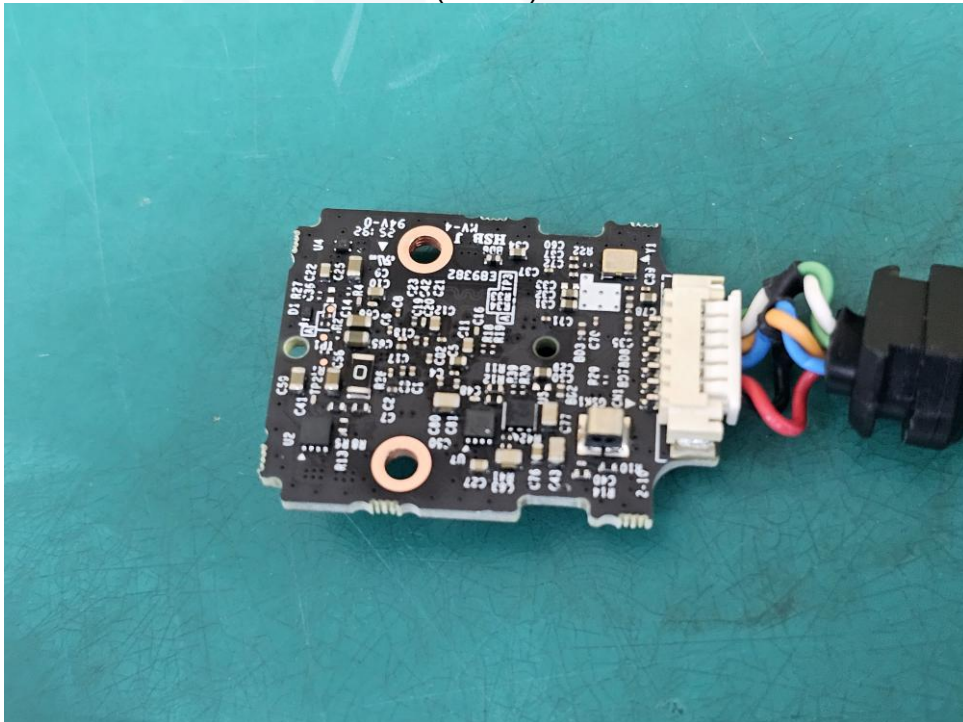


## EUT Internal View – Main Board

(Top)



(Bottom)





Label and Location



|                                                                                                                                                   |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <p><b><u>LENS MODULE</u></b></p> <p>Model No : SLA-F4780VA</p> <p>Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED</p> <p>Made in Vietnam</p> | <p><b>UK CA CE</b></p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|

The End.