



# TEST REPORT



Report No. : KES-EM242542

Page 1 / 28

**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 : +82-31-381-3838

## 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 : NETWORK CAMERA

Model/Type No. : QND-C8023R

Variant Model : QND-C8013R

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 : Jul. 24, 2024

4. Test date : Jul. 26, 2024 ~ Jul. 28, 2024

5. Date of Issue : Aug. 02, 2024

6. Test Results : In Compliance

*Tested by*

*Reviewed by*

---

Eun Gu, Jeon  
EMC Test Engineer

---

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 |
|---------------|-----------------|------------------|
| Aug. 02, 2024 | KES-EM242542    | Issued           |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |

***This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.***



## TABLE OF CONTENTS

|  |  |    |
|--|--|----|
| 1.0  | General Product Description.....                           | 4  |
| 1.1  | Test Voltage & Frequency .....                             | 6  |
| 1.2  | Variant Model Differences .....                            | 6  |
| 1.3  | Device Modifications .....                                 | 6  |
| 1.4  | Equipment Under Test .....                                 | 6  |
| 1.5  | Support Equipments .....                                   | 6  |
| 1.6  | External I/O Cabling.....                                  | 7  |
| 1.7  | EUT Operating Mode(s).....                                 | 7  |
| 1.8  | Configuration.....   | 8  |
| 1.9  | Remarks when standards applied .....                       | 9  |
| 1.10   | Calibration Details of Equipment Used for Measurement..... | 9  |
| 1.11   | Test Facility .....  | 9  |
| 1.12   | Laboratory Accreditations and Listings .....               | 9  |
| 2.0  | Test Regulations .....                                     | 10 |
| 2.1  | Conducted Emissions at Mains Power Ports.....              | 11 |
| 2.2  | Conducted Emissions at Telecommunication Ports.....        | 12 |
| 2.3  | Radiated Electric Field Emissions(Below 1 GHz).....        | 13 |
| 2.4  | Radiated Electric Field Emissions(Above 1 GHz) .....       | 14 |
| APPENDIX A – TEST DATA .....                         |  | 15 |
| Conducted Emissions at Mains Power Ports .....       |  | 15 |
| Conducted Emissions at Telecommunication Ports ..... |  | 17 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |  | 18 |
| Radiated Electric Field Emissions(Above 1 GHz).....  |  | 19 |
| Test Setup Photos and Configuration.....             |  | 20 |
| Conducted Emissions at Mains Power Ports .....       |  | 20 |
| Conducted Emissions at Telecommunication Ports ..... |  | 21 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |  | 22 |
| Radiated Electric Field Emissions(Above 1 GHz).....  |  | 23 |
| EUT External Photographs.....                        |  | 24 |
| EUT Internal Photographs.....                        |  | 25 |



## 1.0 General Product Description

### Main Specifications of EUT are:

| Highest Maximum Frequency  | Above 108 Mhz  |
|----------------------------|--|
| <b>Video</b>               |  |
| Imaging Device             | 1/2.8" CMOS  |
| Resolution                 | 2592x1944, 2560x1440, 1920x1080, 1280x960, 1280x720, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240   |
| Max. Framerate             | H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) (WDR on/off)<br>MJPEG: Max. 30fps(@5MP Max. 5fps)   |
| Min. Illumination          | Color: 0.08Lux(F1.6, 1/30sec, 30IRE)<br>BW: 0.003Lux(F1.6, 1/30sec, 30IRE), 0Lux(IR LED on) (TBD)  |
| Video Out                  | USB: Micro USB Type B, 1280x720 for installation   |
| <b>Lens</b>                |  |
| Focal Length (Zoom Ratio)  | 4.0mm fixed focal  |
| Max. Aperture Ratio        | F1.6   |
| Angular Field of View      | H: 80° / V: 59° / D: 102°  |
| Min. Object Distance       | 0.5m (1.64ft)  |
| Focus Control              | Fixed  |
| Lens Type                  | Fixed IRIS   |
| Mount Type                 | M12  |
| <b>Pan / Tilt / Rotate</b> |  |
| Pan / Tilt / Rotate Range  | 0°~350° / 0°~70° / 0°~355°   |
| <b>Operational</b>         |  |
| Camera Title               | Displayed up to 85 characters  |
| Day & Night                | Auto(ICR)  |
| Backlight Compensation     | BLC, WDR, SDR  |
| Wide Dynamic Range         | 120dB  |
| Digital Noise Reduction    | WiseNRⅡ(Based on AI engine)<br>SSNRV   |
| Motion Detection           | 8ea, 8point polygonal zones  |
| Privacy Masking            | 32ea, 4point quadrangle zones<br>- Color: Gray/Green/Red/Blue/Black/White<br>Dynamic Privacy Mask<br>- Mosaic  |
| Gain Control               | Low / Middle / High  |
| White Balance              | ATW / AWC / Manual / Indoor / Outdoor  |
| LDC                        | Support  |
| Electronic Shutter Speed   | Minimum / Maximum / Anti flicker (1/5~1/25,000sec)<br>Prefer shutter control(Based on AI engine)   |
| Video Rotation             | Flip, Mirror, Hallway view(90°/270°)   |
| Analytics                  | Classified object type: Person/Vehicle(Type:car/bus/truck/motorcycle/bicycle)<br>Attributes: Person(Upper/lower clothes color),<br>Vehicle(Type:car/bus/truck/motorcycle/bicycle and color)<br>Support DetectionShot<br>Analytics events based on AI engine<br>- Motion detection*, Object detection, Virtual line*(Crossing/Direction), Virtual area*(Loitering/Intrusion/Enter/Exit)<br>Analytics events<br>- Defocus detection, Tampering, Virtual area(Appear/Disappear)<br><br>* Some of the video analytics only works with people and vehicle detection |
| Business Intelligence      | Based on AI engine: People counting, Vehicle counting, Queue management, Heatmap   |
| Alarm I/O                  | Input 1ea / Output 1ea<br>* Alarm I/O is supported through an optional cable(SPP-C7200)  |
| Alarm Triggers             | Analytics, Network disconnect, Alarm input   |
| Alarm Events               | When alarm trigger occurred<br>- File upload(image) : e-mail/FTP<br>- Notification : e-mail<br>- Recording : SD/SDHC/SDXC or NAS recording at event triggers<br>- Alarm output<br>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)<br>- MQTT: publication  |
| Audio In                   | Built-in MIC   |
| Light Type                 | IR LED (850nm)   |
| Light Viewable Length      | 25m(82.02ft) (TBD)   |
| IR Wavelength              | long-life 850 nm IR LED  |



Report No. : KES-EM242542

|                                       |   |
|---------------------------------------|---|
| <b>Network</b>                        |   |
| Ethernet                              | RJ-45(10/100BASE-T)   |
| Video Compression                     | H.265/H.264: Main/High, MJPEG   |
| Smart Codec                           | Manual(Sea area), WiseStreamIII(Based on AI engine)   |
| Bitrate Control                       | H.264/H.265: CBR or VBR<br>MJPEG: VBR   |
| Streaming                             | Unicast(20 users) / Multicast<br>Multiple streaming(Up to 5 profiles)   |
| Protocol                              | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTMP (TCP, UDP Unicast), MQTT |
| Application Programming Interface     | ONVIF Profile S/G/T/M<br>SUNAPI(HTTP API)   |
| <b>Security</b>                       |   |
| OS / Firmware Protect                 | Secure boot, Signed firmware, Firmware encryption   |
| User authentication                   | Digest Authentication, Prevent brute-force attack   |
| Network authentication                | 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)   |
| Secure Communication                  | HTTPS, SRTP, WSS(Websocket secure)  |
| Access Control                        | Access control based on IP address  |
| Data Protect                          | Authentication information encryption, ZIP compression encryption   |
| Audit                                 | User Access/System/Event log management   |
| Device ID                             | Device Certificate(Hanwha Private Root CA)  |
| Secure Storage                        | SDcard partition encrypt  |
| <b>General</b>                        |   |
| Webpage Language                      | English, Korean, Simplified Chinese, Traditional Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek  |
| Edge Storage                          | Micro SD/SDHC/SDXC 1slot 256GB  |
| Memory                                | 2GB RAM, 1GB Flash  |
| <b>Environmental &amp; Electrical</b> |   |
| Operating Temperature / Humidity      | -10°C~+45°C(+14°F~+113°F) / 0~95% RH(non-condensing)  |
| Storage Temperature / Humidity        | -30°C~+60°C(-22°F~+140°F) / 0~95% RH  |
| Input Voltage                         | PoE(IEEE802.3af, Class3)  |
| Power Consumption                     | PoE: Max 8.1W,<br>typical 4.0W  |
| <b>Mechanical</b>                     |   |
| Color / Material                      | White / Plastic<br>Bubble : Hard-coated dome  |
| RAL Code                              | RAL9003   |
| Product Dimensions / Weight           | ø110x90mm(ø4.33x3.54"), 317.0g(0.70 lb)   |
| Compatible Conduit hole / Gang        | SBD-110GP1 : Single, Double, 4" Octagon (Sold separately)   |
| <b>Certifications &amp; Standards</b> |   |
| 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<br>IEC/EN 62471   |
| Environment                           | IEC/EN 63000  |
| <b>Compatible Models</b>              |   |
| Hanging Adaptor                       | SBP-120HWW  |
| Back Box                              | SBV-140BW   |
| Ceiling Mount (Assy)                  | SBP-300CMW1/900CMW, SBP-150CMI/300CMI, SBP-300CMTW, SBP-300CMTS   |
| Wall Mount                            | SBP-125WMW1, SBP-300WMW/WMW1, SBP-390WMW2   |
| Pole Mount                            | SBD-140PMW, SBP-300PMW2, SBD-140PMB   |
| In-ceiling Mount                      | SHD-1200FPW   |
| Corner Mount                          | SBP-300KMW1, SBD-140KMB   |
| Parapet Mount                         | SBP-300LMW, SBP-156LMW1   |
| Tilt Mount                            | SBV-140TMW  |
| Cabinet                               | SBP-300NBW  |
| Gang Plate                            | SBD-110GP1  |
| Other Compatible Models               | SPP-C7200 (Alarm Cable)   |
| <b>DORI (EN62676-4 standard)</b>      |   |
| Detect (25PPM/ 8PPF)                  | 61.8m(202.7ft)  |
| Observe (63PPM/ 19PPF)                | 24.7m(81.1ft)   |
| Recognize (125PPM/ 38PPF)             | 12.4m(40.5ft)   |
| Identify (250PPM/ 76PPF)              | 6.2m(20.3ft)  |
| <b>Ver</b>                            |   |
| Ver                                   | 202407  |



## 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 240 V, 50 Hz

## 1.2 Variant Model Differences

Addition of a simple derivative model due to the difference in fixed lenses  
(No electronics in the lens)

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                           | Remarks |
|----------------|--------------|---------------|--|---------|
| NETWORK CAMERA | QND-C8023R   | -             | HANWHA VISION VIETNAM COMPANY LIMITED. | EUT     |

## 1.5 Support Equipments

| Description    | Model Number | Serial Number | Manufacturer                                     | Remarks |
|----------------|--------------|---------------|--|---------|
| Laptop         | P95G001      | 9JM8HT2       | DELL INC.  | -       |
| Laptop Adapter | HA65NM130    | -             | Chicony Power Technology(Suzhou)Co.,Ltd.         | -       |
| Alarm          | -            | -             | -  | -       |
| Button Alarm   | -            | -             | -  | -       |
| Micro SD Card  | -            | -             | SanDisk  | 16 GB   |
| PoE Injector   | MA-INJ-4     |               | Changzhou Wujin Hong Guang radio Factory Co.,LTD | -       |
| Headset        | K550         | -             | Britz®   | -       |
| Cell Phone     | SM-N960N     | -             | Samsung Electronics Co., Ltd.                    | -       |



## 1.6 External I/O Cabling

| Start                |                     | END            |               | Cable Spec. |        |
|----------------------|---------------------|----------------|---------------|-------------|--------|
| Description          | I/O Port            | Description    | I/O Port      | Length      | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (PoE)         | PoE Injector   | RJ-45 (PoE)   | 3.1         | U      |
|                      | 7 Pin (Alarm/Audio) | Headset        | Line          | 2.2         | U      |
|                      |                     | Alarm          | Line          | 3.5         | U      |
|                      |                     | Button Alarm   | Line          | 3.5         | U      |
|                      | Micor SD Slot       | Micor SD Card  | Micor SD Slot | -           | -      |
| PoE Injector         | RJ-45 (LAN)         | Laptop         | RJ-45         | 3.1         | U      |
| Laptop               | DC Jack             | Laptop Adapter | Line          | 1.4         | U      |
|                      | 3.5 mm              | Cell Phone     | 3.5 mm        | 1.2         | U      |

\* Unshielded=U, Shielded=S

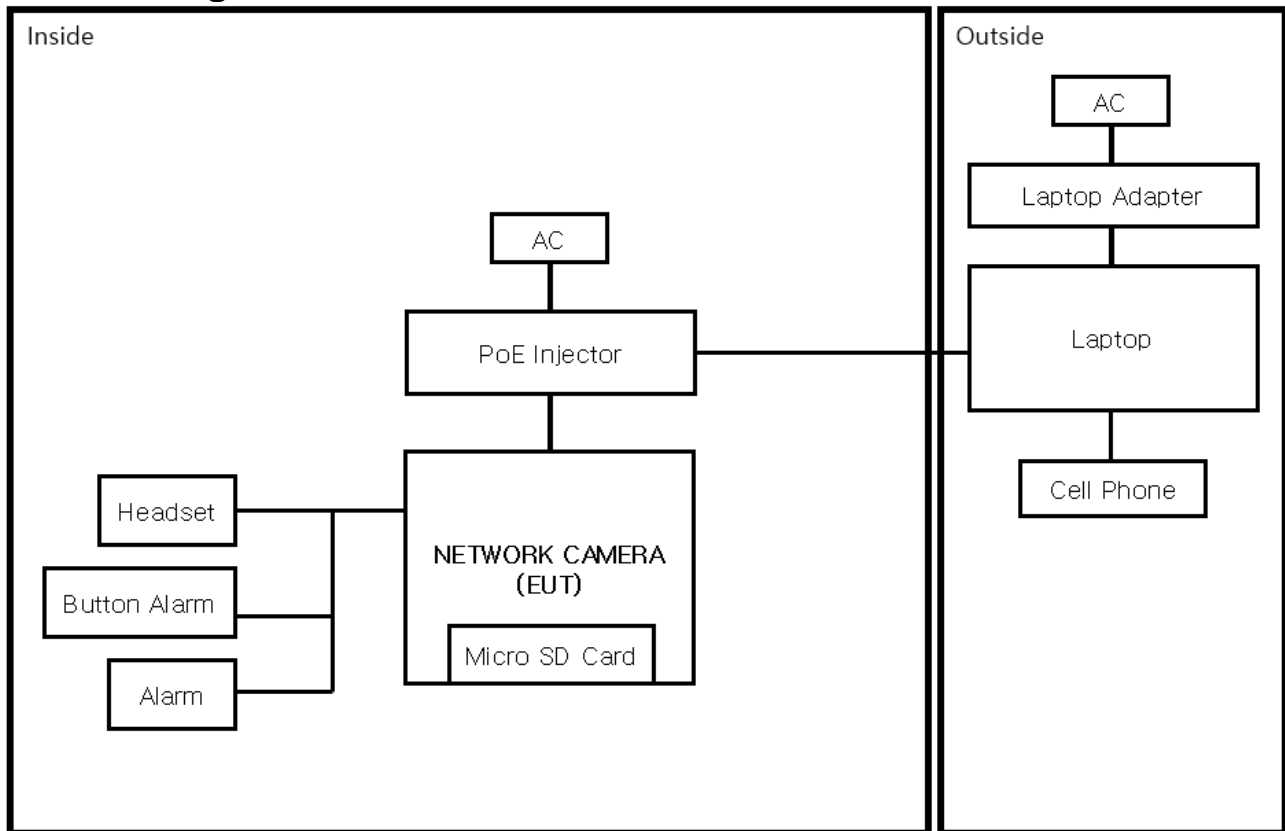
## 1.7 EUT Operating Mode(s)

| Test mode | Normal operating  | Test Voltages   |
|-----------|---|-----------------|
| Operating | <ul style="list-style-type: none"><li>- Monitoring EUT Using Web Viewer, Ping Test</li><li>- Check Audio Port Behavior Through Headset</li><li>- When the Button Alarm is pressed, make sure the Alarm is working</li><li>- Check the files stored on the Micro SD Card after testing</li></ul> | AC 240 V, 50 Hz |

| EUT Test operating S/W |         |                         |
|------------------------|---------|-------------------------|
| Name                   | Version | Manufacture Company     |
| Web Viewer             | -       | Hanwha Vision Co., Ltd. |



## 1.8 Configuration





**1.9 Remarks when standards applied**

- The USB port was excluded from the test as a port for administrators.
  - It receives PoE power, and the PoE port is considered a wired network port.
- Test items related to the power port are not applicable.




**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<br>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:

☒ **AS/NZS CISPR 32:2015 AMD 1:2020**

☒ Class A

☐ Class B





## 2.1 Conducted Emissions at Mains Power 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, 08, 2024 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 08, 2024 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 01, 10, 2025 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 08, 2024 |

**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**Refer to 'Remarks when standards applied'.



## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**

Jul. 26, 2024

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101783        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 01, 10, 2025 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 11, 09, 2024 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101666        | 03, 06, 2025 |
| <input type="checkbox"/>            | ISN               | ISN S8       | SCHWARZBECK  | ISN-S8-0019   | 03, 05, 2025 |

**Test Conditions**

Temperature: (24,2 ± 0,1) °C

Relative Humidity: (50,2 ± 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.



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

**Test Date**

Jul. 28, 2024

**Test Location**☐ OPEN AREA TEST SITE #2☒ 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, 2025 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 17, 2024 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 02, 13, 2025 |

**Test Conditions**

Temperature: (23,9 ± 0,1) °C

Relative Humidity: (46,0 ± 0,1) % 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**

Jul. 27, 2024

**Test Location**

SEMI ANECHOIC CHAMBER #3

**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          | ESR7         | R & S            | 101190        | 07, 31, 2024 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 03, 05, 2025 |
| <input checked="" type="checkbox"/> | ATTENUATOR                 | 8491A        | HP               | 35496         | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 03, 05, 2025 |

**Test Conditions**

Temperature: (24,2 ± 0,1) °C

Relative Humidity: (46,5 ± 0,1) % 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.



## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

HOT LINE

N/A



NEUTRAL LINE

N/A

◆ Calculation

$\text{QuasiPeak[dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value[dBuV]} + \text{Corr. [dB]}$

QuasiPeak / CAverage : The Final Value

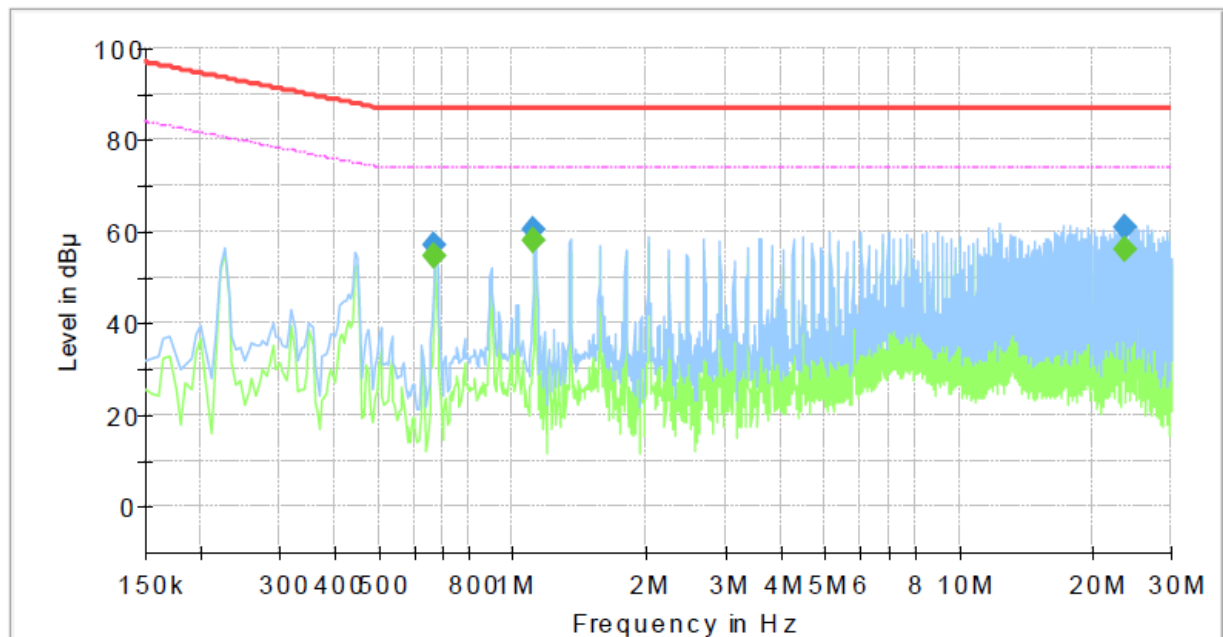
Reading Value : Not shown in the table.

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



**Conducted Emissions at Telecommunication Ports****[1 000 Mbps]****Common Information**

Test Description: Telecommunication Emission  
Job No.: KES-EM242542  
Mode :  
Speed : 100 Mbps  
Operator Name: KES

**Final Result**

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.670000        | ---              | 54.75           | 74.00        | 19.25       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.670000        | 56.91            | ---             | 87.00        | 30.09       | 1000.0          | 9.000           | Single Line | 19.6       |
| 1.120000        | ---              | 58.00           | 74.00        | 16.00       | 1000.0          | 9.000           | Single Line | 19.5       |
| 1.120000        | 60.29            | ---             | 87.00        | 26.71       | 1000.0          | 9.000           | Single Line | 19.5       |
| 23.510000       | ---              | 55.93           | 74.00        | 18.07       | 1000.0          | 9.000           | Single Line | 20.3       |
| 23.510000       | 60.80            | ---             | 87.00        | 26.20       | 1000.0          | 9.000           | Single Line | 20.3       |

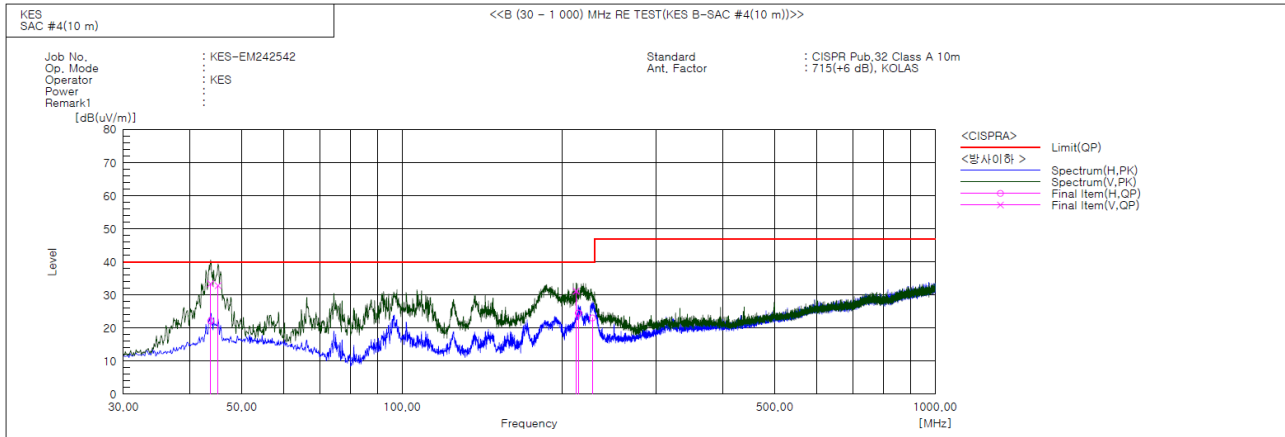
**♦ Calculation**

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(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 43.701          | V   | 55.2                | -21.8         | 33.4                 | 40.0                | 6.6            | 131.0       | 289.0       |        |
| 2   | 43.744          | H   | 43.9                | -21.8         | 22.1                 | 40.0                | 17.9           | 362.0       | 3.0         |        |
| 3   | 45.156          | V   | 54.3                | -21.5         | 32.8                 | 40.0                | 7.2            | 172.0       | 229.0       |        |
| 4   | 211.974         | V   | 51.1                | -19.9         | 31.2                 | 40.0                | 8.8            | 103.0       | 6.0         |        |
| 5   | 214.084         | H   | 44.2                | -19.7         | 24.5                 | 40.0                | 15.5           | 400.0       | 68.0        |        |
| 6   | 227.395         | H   | 42.2                | -19.2         | 23.0                 | 40.0                | 17.0           | 353.0       | 318.0       |        |

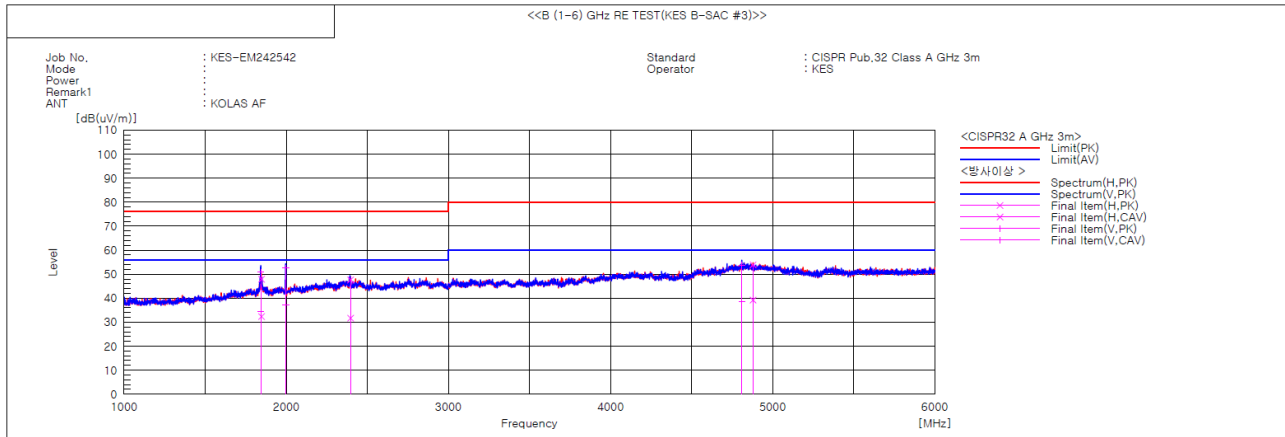
**◆ Calculation**

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)**

| No. | Frequency<br>[MHz] | (P) | Reading<br>PK<br>[dB(μV)] | Reading<br>CAV<br>[dB(μV)] | c.f<br>[dB(1/m)] | Result<br>PK<br>[dB(μV/m)] | Result<br>CAV<br>[dB(μV/m)] | Limit<br>PK<br>[dB(μV/m)] | Limit<br>AV<br>[dB(μV/m)] | Margin<br>PK<br>[dB] | Margin<br>CAV<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|----------------------------|------------------|----------------------------|-----------------------------|---------------------------|---------------------------|----------------------|-----------------------|----------------|----------------|--------|
| 1   | 1843.024           | V   | 47.8                      | 31.4                       | 3.0              | 50.8                       | 34.4                        | 76.0                      | 56.0                      | 25.2                 | 21.6                  | 100.0          | 214.9          |        |
| 2   | 1847.294           | H   | 44.9                      | 29.4                       | 3.0              | 47.9                       | 32.4                        | 76.0                      | 56.0                      | 28.1                 | 23.6                  | 100.0          | 162.9          |        |
| 3   | 1996.507           | V   | 48.6                      | 33.2                       | 4.0              | 52.6                       | 37.2                        | 76.0                      | 56.0                      | 23.4                 | 18.8                  | 100.0          | 175.6          |        |
| 4   | 2396.114           | H   | 41.3                      | 25.3                       | 6.4              | 47.7                       | 31.7                        | 76.0                      | 56.0                      | 28.3                 | 24.3                  | 100.0          | 71.5           |        |
| 5   | 4810.621           | V   | 37.9                      | 22.6                       | 15.9             | 53.8                       | 38.5                        | 80.0                      | 60.0                      | 26.2                 | 21.5                  | 100.0          | 354.1          |        |
| 6   | 4879.435           | H   | 37.8                      | 23.1                       | 16.1             | 53.9                       | 39.2                        | 80.0                      | 60.0                      | 26.1                 | 20.8                  | 100.0          | 199.2          |        |

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



## **Test Setup Photos and Configuration**

### **Conducted Emissions at Mains Power Ports**

N/A



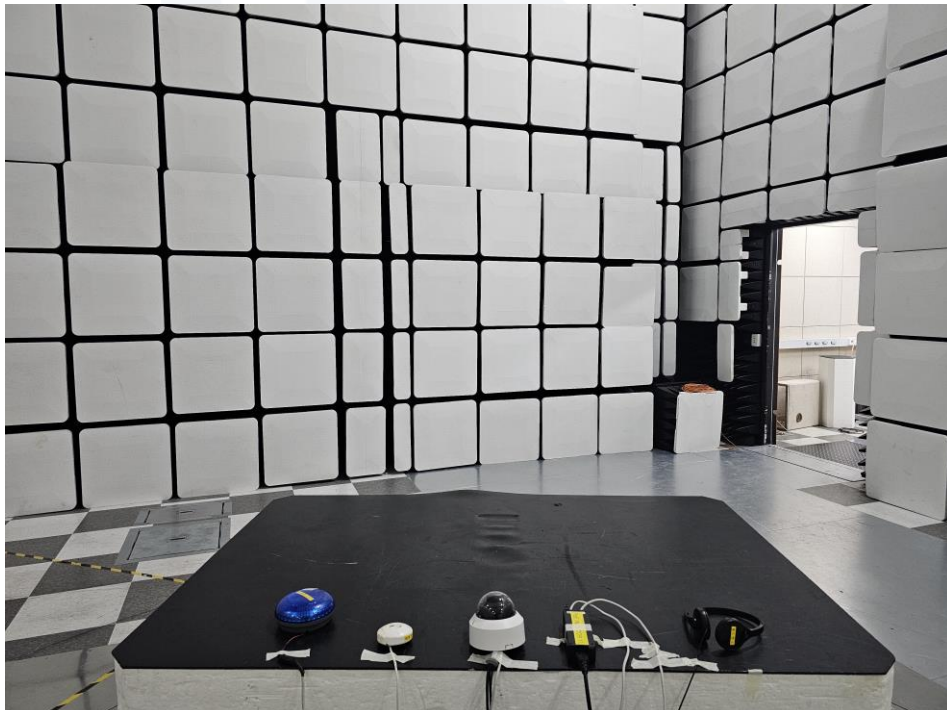
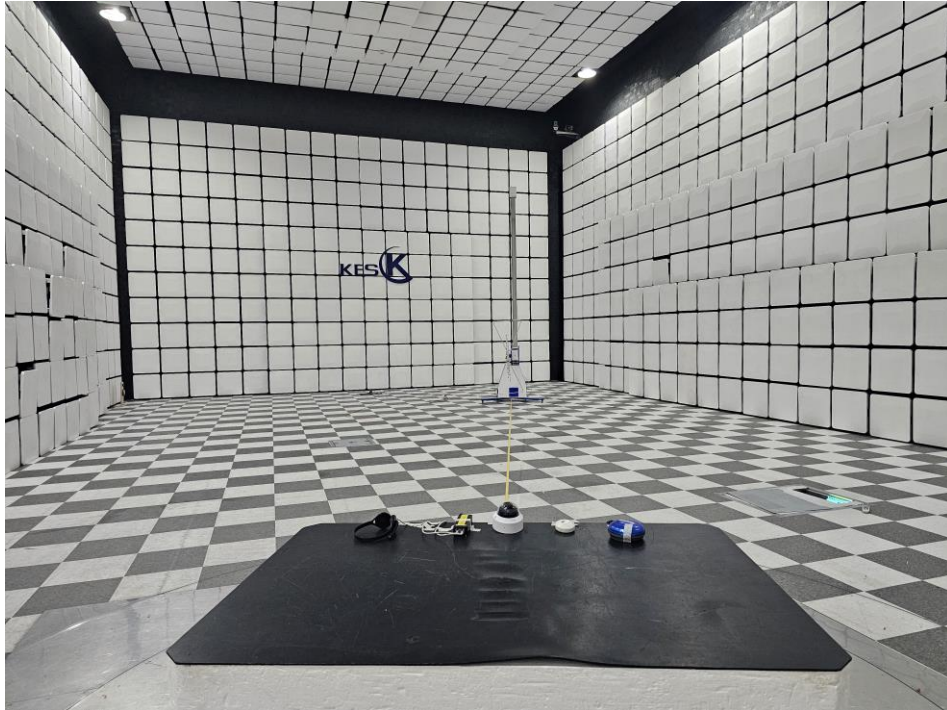
## Conducted Emissions at Telecommunication Ports





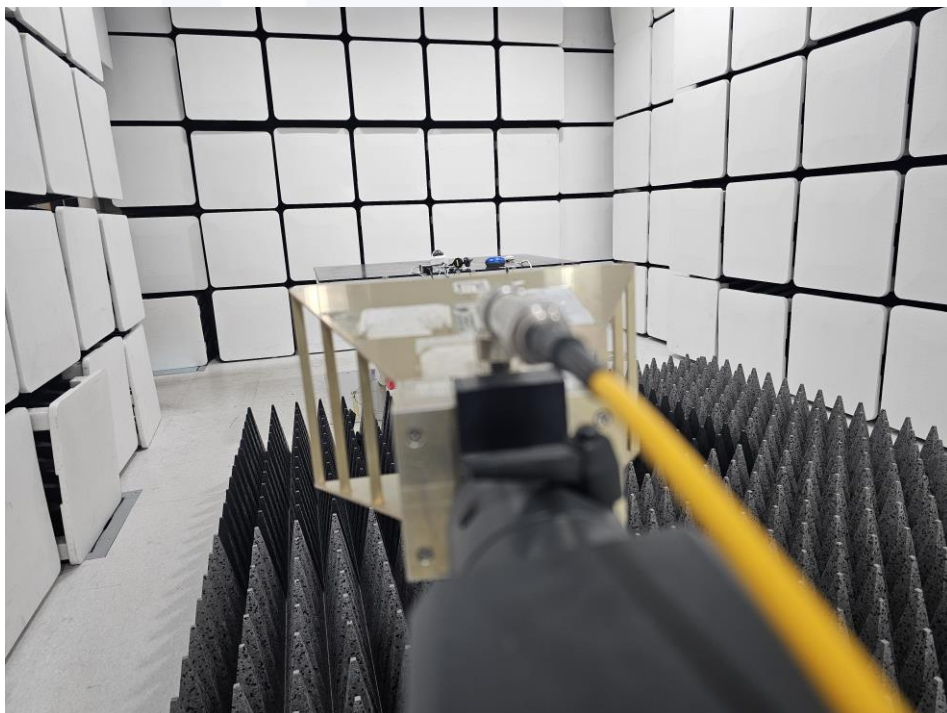
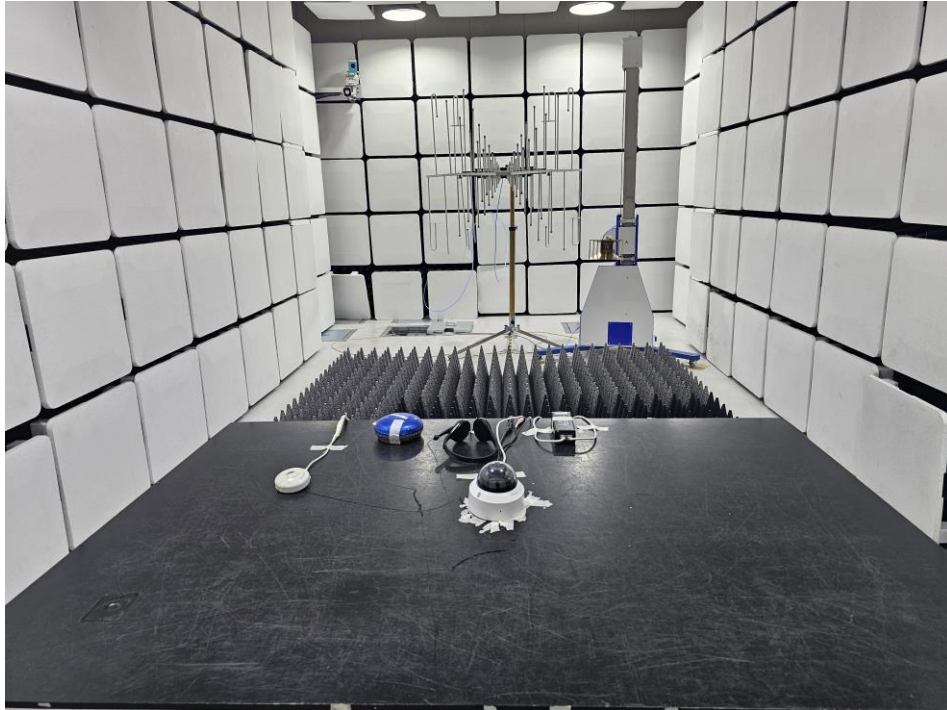


## Radiated Electric Field Emissions(Below 1 GHz)





## Radiated Electric Field Emissions(Above 1 GHz)





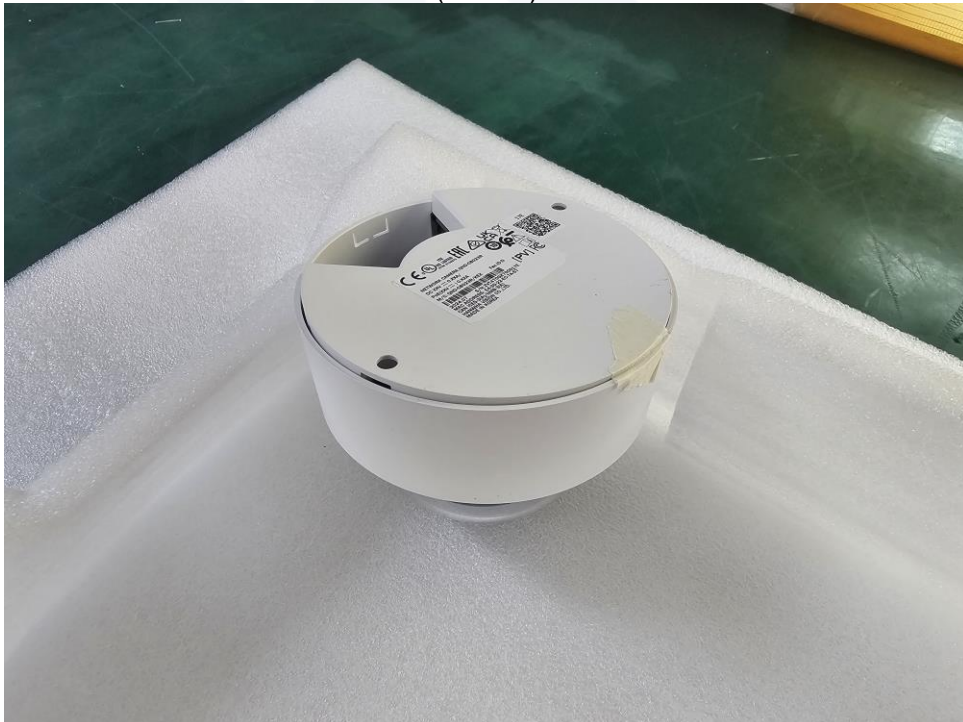


## EUT External Photographs

(Top)



(Bottom)

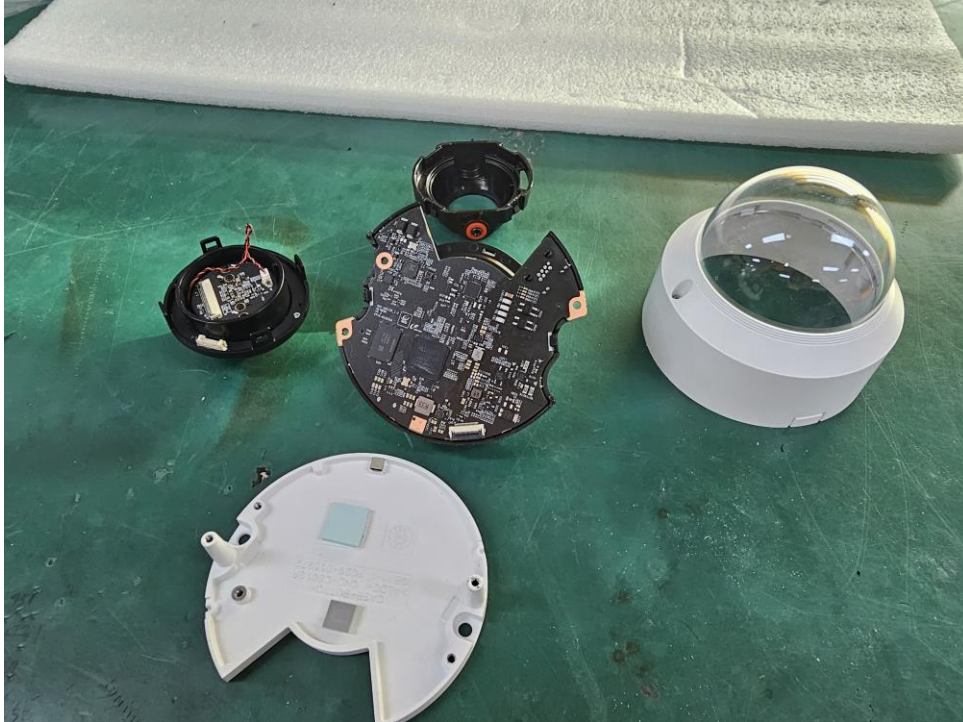






## EUT Internal Photographs

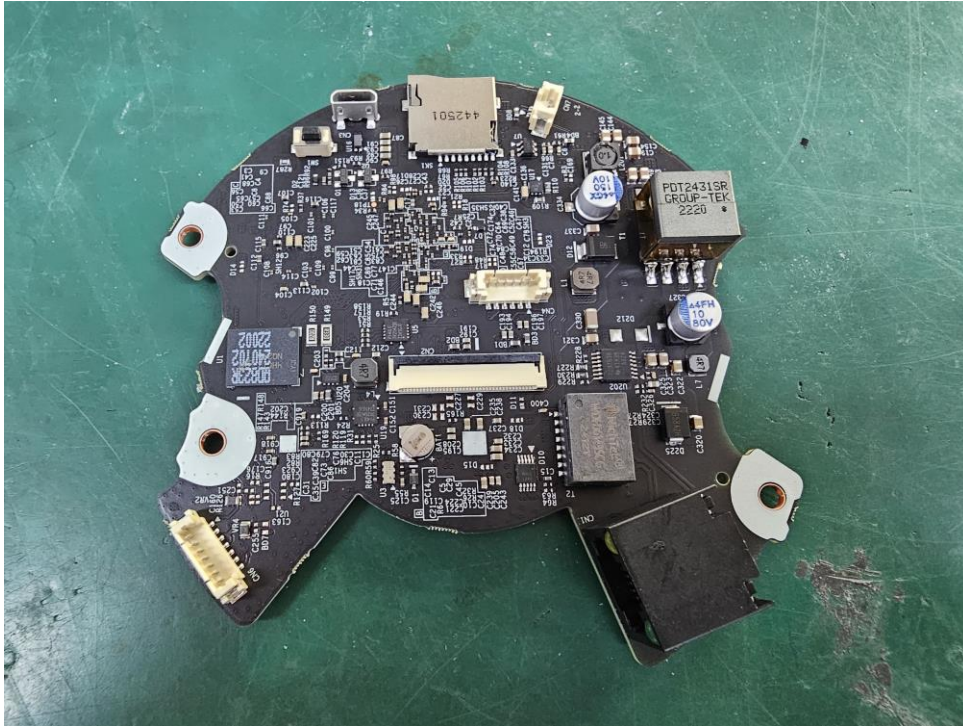
(Internal View)



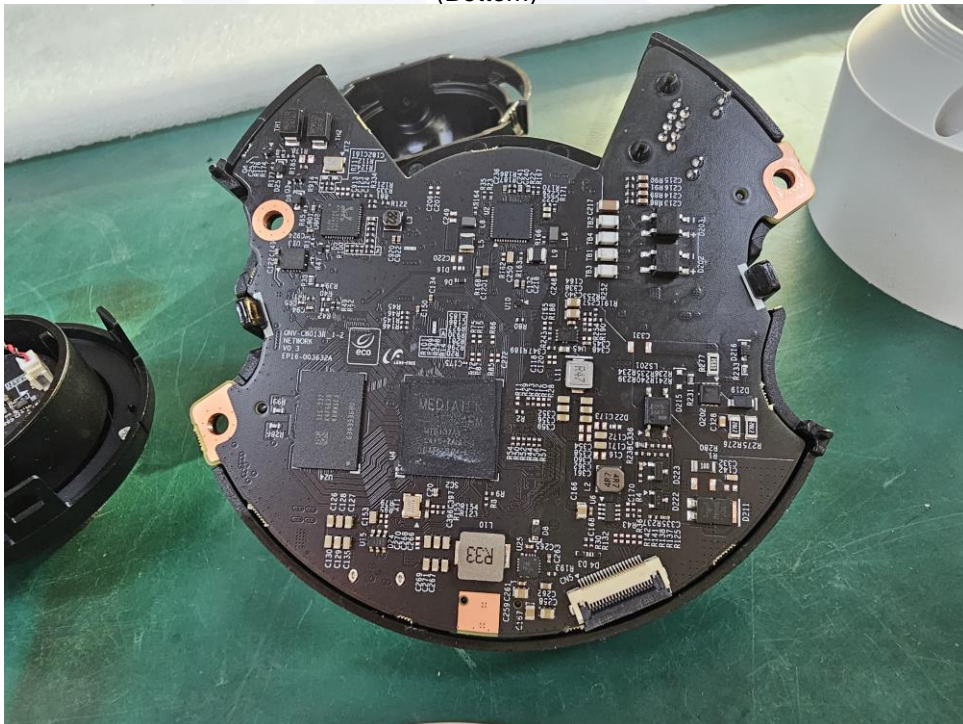


## EUT Internal View – Board 1

(Top)



(Bottom)







## EUT Internal View – Board 2

(Top)



(Bottom)





### EUT Internal View – Board 3

(Top)



(Bottom)

