



# TEST REPORT



Report No. : KES-EM252068

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**KES Co., Ltd.**

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## 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. : XNB-A8004

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 Province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex)

3. Date of Receipt : Jun. 09, 2025

4. Test date : Jul. 16, 2025 ~ Jul. 18, 2025

5. Date of Issue : Aug. 19, 2025

6. Test Results : In Compliance

*Tested by*

*Reviewed by*

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Seong Jun, 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 |
|---------------|-----------------|------------------|
| Aug. 19, 2025 | KES-EM252068    | Issued           |
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## 1.0 General Product Description

### Main Specifications of EUT are:

| XNB-A8004                                |                                                                                                                                                                                                                                                                                            |                                                                            |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Video</b>                             |                                                                                                                                                                                                                                                                                            |                                                                            |
| Imaging Device                           | Size                                                                                                                                                                                                                                                                                       | 1/2.8"                                                                     |
|                                          | Type                                                                                                                                                                                                                                                                                       | CMOS                                                                       |
| Resolution                               | 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x960, 1280x720, 1024x768, 800x600, 640x480, 640x360, 320x240, 320x180                                                                                                                                                                      |                                                                            |
| Max. Framerate                           | H.265/H.264                                                                                                                                                                                                                                                                                | 30fps/25fps(60Hz/50Hz)                                                     |
|                                          | MJPEG                                                                                                                                                                                                                                                                                      | 30fps@5MP Max. 5fps                                                        |
| Video Out                                | USB: Micro USB Type C                                                                                                                                                                                                                                                                      |                                                                            |
| <b>Lens</b>                              |                                                                                                                                                                                                                                                                                            |                                                                            |
| Focus Control                            | Simple focus                                                                                                                                                                                                                                                                               |                                                                            |
| Lens Type                                | DC auto iris, P iris(IR corrected), Manual, I-CS                                                                                                                                                                                                                                           |                                                                            |
| Mount Type                               | C mount, CS mount                                                                                                                                                                                                                                                                          |                                                                            |
| <b>Operational</b>                       |                                                                                                                                                                                                                                                                                            |                                                                            |
| Day & Night                              | Auto(ICR)                                                                                                                                                                                                                                                                                  |                                                                            |
| Backlight Compensation                   | BLC, HLC, WDR, SDR                                                                                                                                                                                                                                                                         |                                                                            |
| Wide Dynamic Range (dB)                  | 120                                                                                                                                                                                                                                                                                        |                                                                            |
| Digital Noise Reduction                  | WiseNR II(Based on AI engine), SSNR V                                                                                                                                                                                                                                                      |                                                                            |
| Digital Image Stabilization              | Support                                                                                                                                                                                                                                                                                    |                                                                            |
| Defog                                    | Support                                                                                                                                                                                                                                                                                    |                                                                            |
| Motion Detection                         | Quantity                                                                                                                                                                                                                                                                                   | 8ea                                                                        |
|                                          | Shape                                                                                                                                                                                                                                                                                      | 8point Polygonal zones                                                     |
| Privacy Masking                          | Quantity                                                                                                                                                                                                                                                                                   | 32ea                                                                       |
|                                          | Shape                                                                                                                                                                                                                                                                                      | 8point Polygonal zones                                                     |
|                                          | Color / Option                                                                                                                                                                                                                                                                             | Gray, Green, Red, Blue, Black, White, Mosaic, Purple, Yellow               |
|                                          | Dynamic Privacy Masking: Color / Option                                                                                                                                                                                                                                                    | Gray, Green, Red, Blue, Black, White, Mosaic, Purple, Yellow               |
| Gain Control                             | Off, Max gain, Manual                                                                                                                                                                                                                                                                      |                                                                            |
| White Balance                            | ATW, NarrowATW, AWC, Manual, Indoor, Outdoor                                                                                                                                                                                                                                               |                                                                            |
| LDC                                      | Support/Fill/stretch mode                                                                                                                                                                                                                                                                  |                                                                            |
| Electronic Shutter                       | Mode                                                                                                                                                                                                                                                                                       | Minimum, Maximum, Anti Flicker, Prefer shutter control(Based on AI engine) |
|                                          | Speed Range                                                                                                                                                                                                                                                                                | 2~1/30,000sec                                                              |
| Video Rotation                           | Flip, Mirror, Hallway view(90°/270°)                                                                                                                                                                                                                                                       |                                                                            |
| Serial Interface                         | RS-485(Samsung-T, Pelco-D/P, Panasonic, Bosch, AD, GE, Vicon, Honeywell)                                                                                                                                                                                                                   |                                                                            |
| Alarm Interface                          | In/Out                                                                                                                                                                                                                                                                                     | 2 configurable I/O ports                                                   |
|                                          | Others                                                                                                                                                                                                                                                                                     | Support extra alarm I/O via optional I/O box                               |
| Alarm Triggers                           | Analytics, Network disconnect, Alarm input, Time schedule, MQTT subscription, Day/Night, Storage disruption                                                                                                                                                                                |                                                                            |
| Alarm Events When Alarm Trigger Occurred | File upload(image): e-mail/FTP/SFTP, File upload(video clip): FTP/SFTP, Notification: e-mail, Recording: SD/SDHC/SDXC or NAS recording at event triggers, Alarm output, Handover: PTZ preset, send message by HTTP/HTTPS/TCP, Audio clip playback, MQTT: publication, SIP: call generation |                                                                            |
| Audio In                                 | Selectable(mic in/line in), Built-in mic                                                                                                                                                                                                                                                   |                                                                            |
| Audio Out                                | Line out                                                                                                                                                                                                                                                                                   |                                                                            |

|                                                       |                    |                                                                                                                                                                                                                                                    |
|-------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analytics                                             |                    |                                                                                                                                                                                                                                                    |
| Classified Object Type                                |                    | Person, Face, Vehicle, License plate                                                                                                                                                                                                               |
| Attributes                                            | Person             | Upper/Lower clothes color, Gender, Bag                                                                                                                                                                                                             |
|                                                       | Vehicle            | Type(car, bus, truck, motorcycle, bicycle), Color                                                                                                                                                                                                  |
|                                                       | Face               | Age, Gender, Face mask, Glasses                                                                                                                                                                                                                    |
| Re-ID                                                 |                    | Person                                                                                                                                                                                                                                             |
| Thumbnail                                             |                    | BestShot                                                                                                                                                                                                                                           |
| Analytics Events                                      | Based on AI Engine | Object detection, Virtual line(Crossing/Direction), Motion detection, Face mask detection, Social distancing detection, Slip & fall detection, Virtual area(Loitering/Intrusion/Enter/Exit/Appear/Disappear)                                       |
|                                                       | Normal             | Defocus detection, Tampering, Audio detection, Shock detection                                                                                                                                                                                     |
| Business Intelligence                                 | Based on AI Engine | People counting, Queue management, Heatmap, Vehicle counting, Crowd counting                                                                                                                                                                       |
| Network                                               |                    |                                                                                                                                                                                                                                                    |
| Ethernet                                              |                    | Metal shielded RJ-45(10/100BASE-T)                                                                                                                                                                                                                 |
| Video Compression                                     |                    | H.265/H.264: Main/Baseline/High, MJPEG                                                                                                                                                                                                             |
| Audio Compression                                     |                    | G.711 (PCMU): 8KHz(64kbps), G.726(ADPCM): 8KHz(16/24/32/40kbps), AAC-LC: 16KHz(48kbps), OPUS: 48KHz(64kbps)                                                                                                                                        |
| Smart Codec                                           |                    | WiseStream(Based on AI engine)                                                                                                                                                                                                                     |
| Bitrate Control                                       |                    | H.265/H.264: CBR or VBR, MJPEG: VBR                                                                                                                                                                                                                |
| Streaming                                             | Unicast            | Up to 20 users                                                                                                                                                                                                                                     |
|                                                       | Multicast          | Support                                                                                                                                                                                                                                            |
|                                                       | Multiple Streaming | Up to 5 profiles, 3 virtual channel support                                                                                                                                                                                                        |
| Protocol                                              |                    | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SFTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT, SMTP(StartTLS), SIP, Syslog |
| SIP support (VoIP, Peer-to-peer, SIP/PBX integration) |                    | Tested with Cisco, Grandstream, Yealink VoIP phones and Asterisk PBX software                                                                                                                                                                      |
| Application Programming Interface                     | ONVIF              | S, G, T, M                                                                                                                                                                                                                                         |
| Interface                                             | Others             | SUNAPI(HTTP API), Hanwha Vision Open Platform                                                                                                                                                                                                      |
|                                                       | OnCloud(미사용 항목)    | OnCloud edge recording, compatible with Hanwha SD cards up to 1TB                                                                                                                                                                                  |
| Direct Cloud Connection                               |                    | Support                                                                                                                                                                                                                                            |
| Security                                              |                    |                                                                                                                                                                                                                                                    |
| OS / Firmware Protect                                 |                    | Encrypted firmware, Secure boot, Signed firmware                                                                                                                                                                                                   |
| User authentication                                   |                    | Digest authentication, Prevent brute-force attack                                                                                                                                                                                                  |
| Network authentication                                |                    | IEEE 802.1X(EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)                                                                                                                                                                                                 |
| Secure Communication                                  |                    | HTTPS, WSS(WebSocket Secure), SRTP, 802.1AE(MACsec)                                                                                                                                                                                                |
| Access Control                                        |                    | IP-based access control, MAC-based access control, Auto logout                                                                                                                                                                                     |
| Data Protect                                          |                    | Encryption credentials, Encrypt compress for live recording file export                                                                                                                                                                            |
| Audit                                                 |                    | Access / System / Event Log management                                                                                                                                                                                                             |
| Device ID                                             |                    | Device certificate(Hanwha Vision Root CA)                                                                                                                                                                                                          |
| Secure Storage                                        |                    | SDcard partition encrypt(AES-256), Secure element                                                                                                                                                                                                  |
| Supply Chain Security                                 |                    | SBOM                                                                                                                                                                                                                                               |
| Security Certificate                                  |                    | Secure element(RPS 140-3 level3, CC EAL6+), ETSI EN 303 645, IEC 62443-4-1                                                                                                                                                                         |

|                            |                                                                                                                                                                                                          |                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General                    |                                                                                                                                                                                                          |                                                                                                                                                            |
| Memory                     | RAM                                                                                                                                                                                                      | 4GB                                                                                                                                                        |
|                            | Flash                                                                                                                                                                                                    | 8GB eMMC                                                                                                                                                   |
| Edge Storage               | Micro SD/SDHC/SDXC                                                                                                                                                                                       | Max. 1TB x 2slot(Total 2TB)                                                                                                                                |
|                            | SSD                                                                                                                                                                                                      | None                                                                                                                                                       |
| Environmental & Electrical |                                                                                                                                                                                                          |                                                                                                                                                            |
| Operating Condition        | Temperature                                                                                                                                                                                              | -10°C~+55°C(+14°F~+131°F)                                                                                                                                  |
|                            | Humidity                                                                                                                                                                                                 | 0~95% RH(non-condensing)                                                                                                                                   |
| Storage Condition          | Temperature                                                                                                                                                                                              | -50°C~+60°C(-58°F~+140°F)                                                                                                                                  |
|                            | Humidity                                                                                                                                                                                                 | 0~90% RH(non-condensing)                                                                                                                                   |
| Input Voltage              | PoE(IEEE802.3af, Class3), 12VDC                                                                                                                                                                          |                                                                                                                                                            |
| Power Consumption          | PoE                                                                                                                                                                                                      | Max. 8.9W, typical 7.5W                                                                                                                                    |
|                            | 12VDC                                                                                                                                                                                                    | Max. 8.1W, typical 6.7W                                                                                                                                    |
| Wisepower                  | Power monitoring, ECO mode                                                                                                                                                                               |                                                                                                                                                            |
| Power Redundance Follower  | Support                                                                                                                                                                                                  |                                                                                                                                                            |
| Mechanical                 |                                                                                                                                                                                                          |                                                                                                                                                            |
| Color                      | Black                                                                                                                                                                                                    |                                                                                                                                                            |
| Material                   | Aluminum                                                                                                                                                                                                 |                                                                                                                                                            |
| Material Management        | Declaration                                                                                                                                                                                              | RoHS(EU RoHS directive 2011/65/EU and IEC/EN 63000:2018), REACH(Regulation (EC) No. 1907/2006), Conflict mineral policy(Section 1502 of US Dodd Frank Act) |
|                            | Recycle Rate                                                                                                                                                                                             | None                                                                                                                                                       |
| RAL Code                   | RAL9005                                                                                                                                                                                                  |                                                                                                                                                            |
| Product Dimensions         | 81(W)x67(H)x165(D)mm(3.19x2.64x6.48")                                                                                                                                                                    |                                                                                                                                                            |
| Product Weight             | 851g(1.88lb)                                                                                                                                                                                             |                                                                                                                                                            |
| Certifications & Standards |                                                                                                                                                                                                          |                                                                                                                                                            |
| EMC                        | FCC 47 CFR 15 Subpart B Class A, ICES-3(A)/NMB-3(A), CE/UKCA - EN55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3, VCCI CISPR 32 Class A, RCM AS-NZS CISPR 32 Class A, KS C 8932 Class A, KS C 9835 |                                                                                                                                                            |
| Safety                     | UL 62368-1, CAN/CSA C22.2 NO. 62368-1, IEC 62471                                                                                                                                                         |                                                                                                                                                            |
| Environment                | IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-78                                                                                                              |                                                                                                                                                            |



## 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    ☒ PoE

## 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 |
|----------------|--------------|---------------|---------------------------------------|---------|
| NETWORK CAMERA | XNB-A8004    | -             | HANWHA VISION VIETNAM COMPANY LIMITED | EUT     |

## 1.5 Support Equipments

| Description      | Model Number      | Serial Number | Manufacturer                                | Remarks |
|------------------|-------------------|---------------|---------------------------------------------|---------|
| Adapter          | FSP060-DIBAN2     | -             | FSP GROUP INC.                              | -       |
| PoE Injector     | PT-PSE106GBR-AH-S | -             | Dongguan PROCET Network Technology Co., Ltd | -       |
| Notebook         | NT500R5W          | -             | Samsung Eelcotronics Co., Ltd.              | -       |
| Notebook Adapter | PA-1400-96        | -             | LITE-ON TECHNOLOGY CHANGZHOU CO.,LTD        | -       |
| Micro SD Card 1  | -                 | -             | SanDisk                                     | -       |
| Micro SD Card 2  | -                 | -             | SanDisk                                     | -       |
| LED Alarm        | PRO-SL            | -             | SENSOR PRO                                  | -       |
| Button Alarm     | -                 | -             | -                                           | -       |
| Earphone         | -                 | -             | -                                           | -       |
| Smartphone       | SM-N950N          | -             | Samsung Eelcotronics Co., Ltd.              | -       |
| Controller       | SPC-1010          | -             | SamSung Techwin Co.,Ltd.                    | -       |



## 1.6 External I/O Cabling

■ mode 1

| Start                |                    | END              |                    | Cable Spec. |        |
|----------------------|--------------------|------------------|--------------------|-------------|--------|
| Description          | I/O Port           | Description      | I/O Port           | Length      | Shield |
| NETWORK CAMERA (EUT) | 2 Pin              | Adapter          | 2 Pin              | 1.6         | U      |
|                      | Micro SD Card Slot | Micro SD Card 1  | Micro SD Card Slot | -           | -      |
|                      | Micro SD Card Slot | Micro SD Card 2  | Micro SD Card Slot | -           | -      |
|                      | RJ-45 (LAN)        | Notebook         | RJ-45 (LAN)        | 3.1         | U      |
|                      | Alarm IN (2 PIN)   | Button Alarm     | Alarm OUT          | 3.1         | U      |
|                      | Alarm OUT (2 PIN)  | LED Alarm        | Alarm IN           | 3.1         | U      |
|                      | RS-485 (2 PIN)     | Controller       | 2 Pin              | 3.1         | U      |
|                      | Audio IN           | Smartphone       | 3.5 mm             | 1.0         | U      |
|                      | Audio OUT          | Earphone         | 3.5 mm             | 1.4         | U      |
|                      | Ground             | Ground           | Ground             | 1.5         | -      |
| Notebook             | DC Jack            | Notebook Adapter | DC Jack            | 1.6         | U      |

\* Unshielded=U, Shielded=S

■ mode 2

| 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      |
|                      | Micro SD Card Slot | Micro SD Card 1  | Micro SD Card Slot | -           | -      |
|                      | Micro SD Card Slot | Micro SD Card 2  | Micro SD Card Slot | -           | -      |
|                      | Alarm IN (2 PIN)   | Button Alarm     | Alarm OUT          | 3.1         | U      |
|                      | Alarm OUT (2 PIN)  | LED Alarm        | Alarm IN           | 3.1         | U      |
|                      | RS-485 (2 PIN)     | Controller       | 2 Pin              | 3.1         | U      |
|                      | Audio IN           | Smartphone       | 3.5 mm             | 1.0         | U      |
|                      | Audio OUT          | Earphone         | 3.5 mm             | 1.4         | U      |
|                      | Ground             | Ground           | Ground             | 1.5         | -      |
| Notebook             | DC Jack            | Notebook Adapter | DC Jack            | 1.6         | U      |

\* Unshielded=U, Shielded=S



## 1.7 EUT Operating Mode(s)

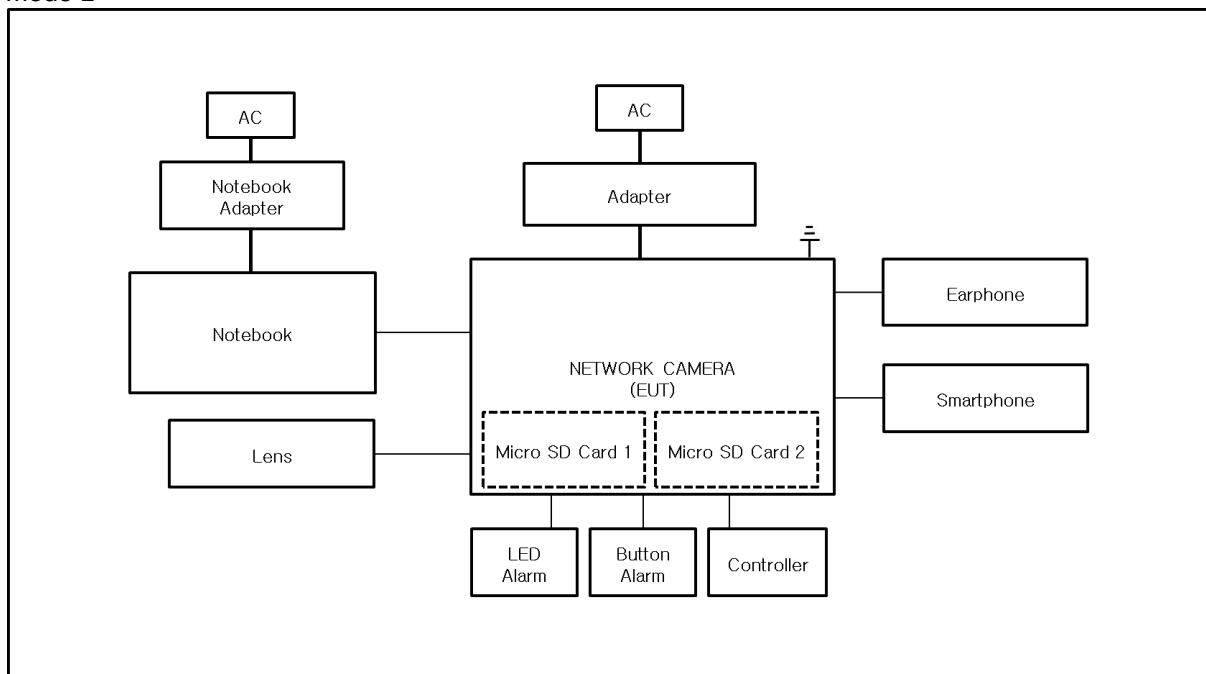
| Test mode |         | Normal operating                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mode 1    | Adapter | <ul style="list-style-type: none"><li>- IP from the test equipment to the laptop was tested by Ping Test on the laptop.</li><li>- The test was conducted by checking whether the camera image was output normally in the Web Viewer.</li><li>- After the test, I checked whether the video was recorded normally on the Micro SD Card.</li></ul> |
| mode 2    | PoE     |                                                                                                                                                                                                                                                                                                                                                  |

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

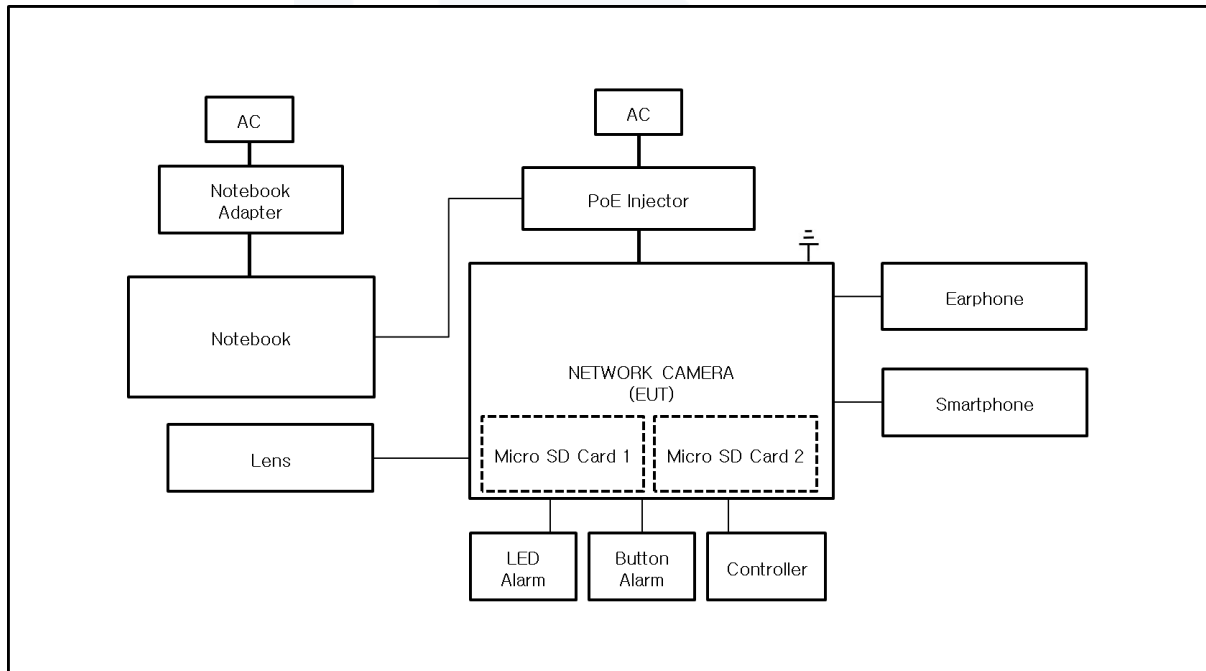


## 1.8 Configuration

### ■ mode 1



### ■ mode 2





### 1.9 Remarks when standards applied

USB Type-C ports are not used and have not been tested.



### 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**

Jul. 17, 2025

**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, 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: (23,8 ± 0,1) °C

Relative Humidity: (46,2 ± 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.



## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**

Jul. 17, 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 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5        | ENY81        | R & S        | 100174        | 11, 12, 2025 |

**Test Conditions**

Temperature:  $(23,8 \pm 0,1) ^\circ\text{C}$   
Relative Humidity:  $(46,2 \pm 0,1) \% \text{ R.H.}$

**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. 16, 2025

**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 | ESW8         | R & S            | 101319        | 03, 24, 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: (24,0 ± 0,1) °C

Relative Humidity: (47,5 ± 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. 18, 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               | 3008A00899    | 03, 05, 2026 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 8491B        | HP               | 23094         | 02, 13, 2026 |

**Test Conditions**

Temperature: (23,5 ± 0,1) °C

Relative Humidity: (46,6 ± 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.  
- The Average of the test data is the cispr average result.



## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

■ mode 1

HOT LINE

Test Description:

Conducted Emission

Job No.:

KES-EM252068

Phase:

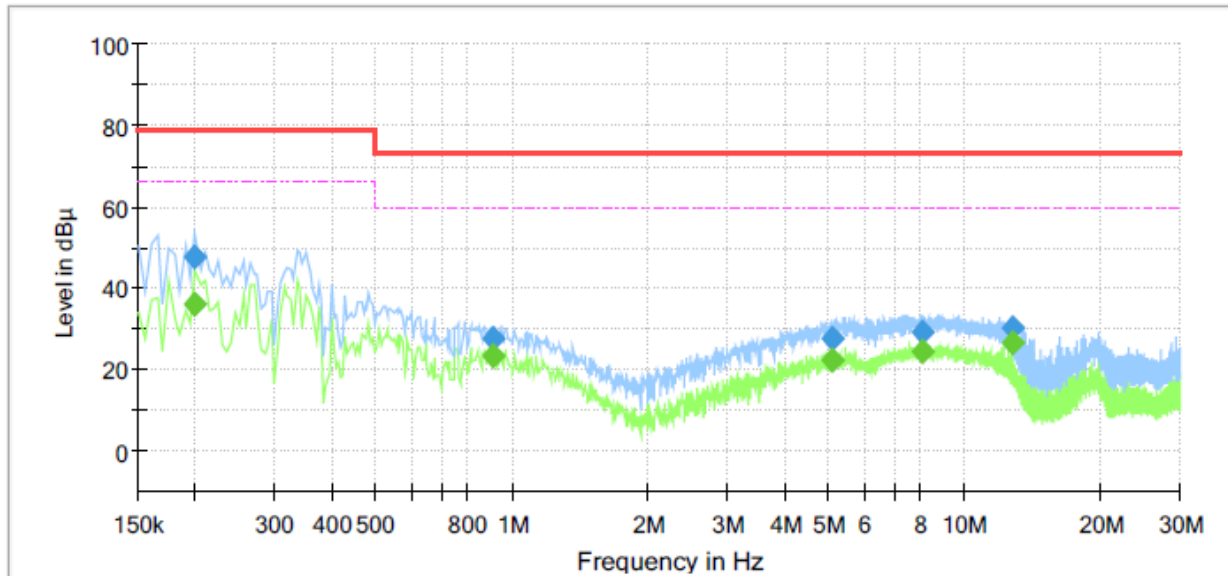
L

Mode:

Mode 1

Operator Name:

KES



### Final\_Result

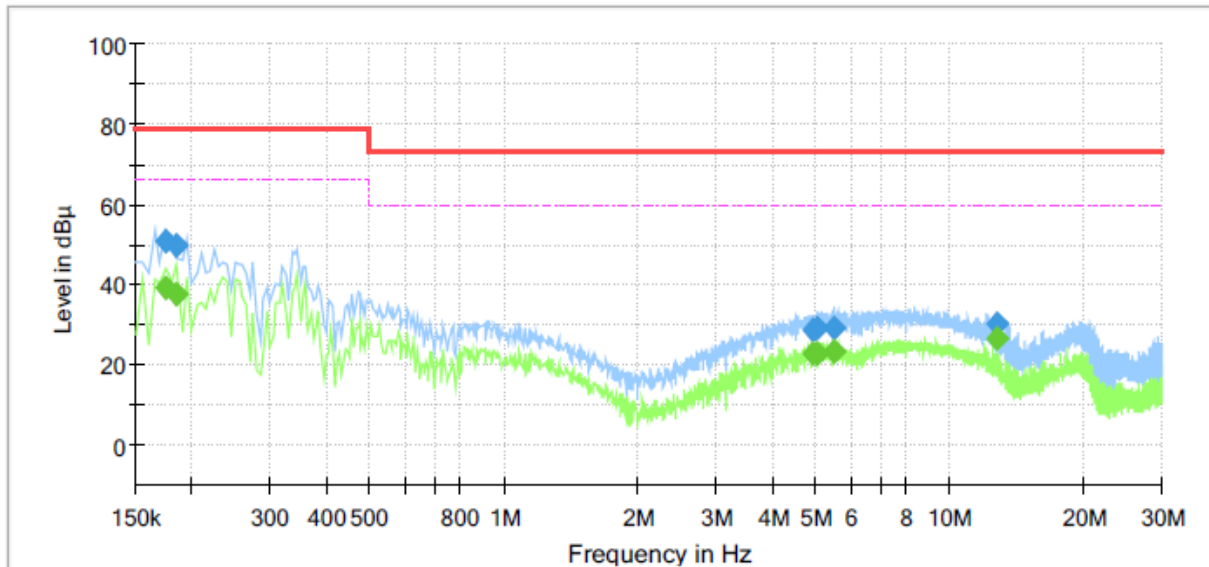
| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | CAverage (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------------|-----------------------|--------------------|-------------|-----------------|-----------------|------|------------|
| 0.200000        | ---                    | 36.23                 | 66.00              | 29.77       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.200000        | 47.87                  | ---                   | 79.00              | 31.13       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.910000        | ---                    | 23.08                 | 60.00              | 36.92       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.910000        | 27.72                  | ---                   | 73.00              | 45.28       | 1000.0          | 9.000           | L1   | 19.6       |
| 5.120000        | ---                    | 22.36                 | 60.00              | 37.64       | 1000.0          | 9.000           | L1   | 19.9       |
| 5.120000        | 27.81                  | ---                   | 73.00              | 45.19       | 1000.0          | 9.000           | L1   | 19.9       |
| 8.045000        | ---                    | 24.21                 | 60.00              | 35.79       | 1000.0          | 9.000           | L1   | 20.0       |
| 8.045000        | 29.09                  | ---                   | 73.00              | 43.91       | 1000.0          | 9.000           | L1   | 20.0       |
| 12.810000       | ---                    | 26.62                 | 60.00              | 33.38       | 1000.0          | 9.000           | L1   | 20.2       |
| 12.810000       | 29.94                  | ---                   | 73.00              | 43.06       | 1000.0          | 9.000           | L1   | 20.2       |



## NEUTRAL LINE

Test Description:  
Job No.:  
Phase:  
Mode:  
Operator Name:

Conducted Emission  
KES-EM252068  
N  
Mode 1  
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) |
|-----------------|------------------------|-----------------------|--------------------|-------------|-----------------|-----------------|------|------------|
| 0.175000        | ---                    | 39.05                 | 66.00              | 26.95       | 1000.0          | 9.000           | N    | 19.5       |
| 0.175000        | 50.72                  | ---                   | 79.00              | 28.28       | 1000.0          | 9.000           | N    | 19.5       |
| 0.185000        | ---                    | 37.40                 | 66.00              | 28.60       | 1000.0          | 9.000           | N    | 19.5       |
| 0.185000        | 49.65                  | ---                   | 79.00              | 29.35       | 1000.0          | 9.000           | N    | 19.5       |
| 4.920000        | ---                    | 22.93                 | 60.00              | 37.07       | 1000.0          | 9.000           | N    | 19.9       |
| 4.920000        | 28.78                  | ---                   | 73.00              | 44.22       | 1000.0          | 9.000           | N    | 19.9       |
| 5.035000        | ---                    | 23.05                 | 60.00              | 36.95       | 1000.0          | 9.000           | N    | 19.9       |
| 5.035000        | 28.88                  | ---                   | 73.00              | 44.12       | 1000.0          | 9.000           | N    | 19.9       |
| 5.535000        | ---                    | 23.29                 | 60.00              | 36.71       | 1000.0          | 9.000           | N    | 19.9       |
| 5.535000        | 29.10                  | ---                   | 73.00              | 43.90       | 1000.0          | 9.000           | N    | 19.9       |
| 12.810000       | ---                    | 26.59                 | 60.00              | 33.41       | 1000.0          | 9.000           | N    | 20.1       |
| 12.810000       | 29.94                  | ---                   | 73.00              | 43.06       | 1000.0          | 9.000           | N    | 20.1       |

## ◆ Calculation

QuasiPeak[dB $\mu$ V] / CAverage [dB $\mu$ V] = Reading Value[dB $\mu$ V] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

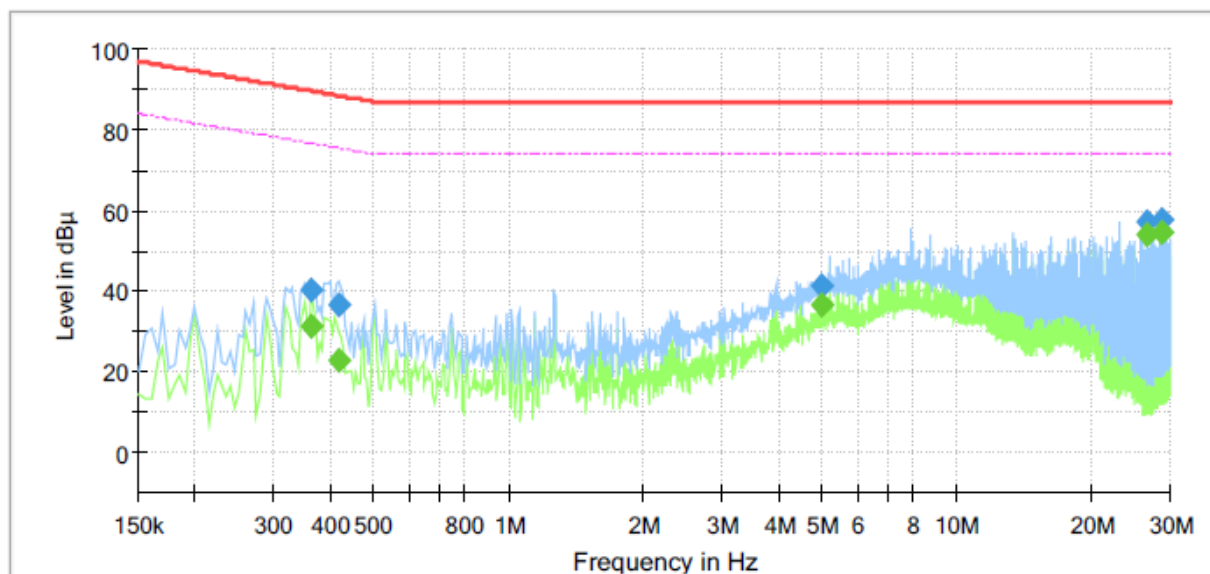
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

**Conducted Emissions at Telecommunication Ports**

■ mode 1

**[100 Mbps]**

Test Description: Telecommunication Emission  
Job No.: KES-EM252068  
Mode : Mode 1  
Speed : 100 Mbps  
Operator Name: KES

**Final\_Result**

| Frequency (MHz) | QuasiPeak (dB μV) | CAverage (dB μV) | Limit (dB μV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|-------------------|------------------|---------------|-------------|-----------------|-----------------|-------------|------------|
| 0.365000        | ---               | 31.43            | 76.61         | 45.18       | 1000.0          | 9.000           | Single Line | 19.5       |
| 0.365000        | 40.19             | ---              | 89.61         | 49.42       | 1000.0          | 9.000           | Single Line | 19.5       |
| 0.420000        | ---               | 22.63            | 75.45         | 52.82       | 1000.0          | 9.000           | Single Line | 19.5       |
| 0.420000        | 36.57             | ---              | 88.45         | 51.88       | 1000.0          | 9.000           | Single Line | 19.5       |
| 5.025000        | ---               | 36.72            | 74.00         | 37.28       | 1000.0          | 9.000           | Single Line | 19.5       |
| 5.025000        | 41.51             | ---              | 87.00         | 45.49       | 1000.0          | 9.000           | Single Line | 19.5       |
| 26.610000       | ---               | 54.12            | 74.00         | 19.88       | 1000.0          | 9.000           | Single Line | 20.1       |
| 26.610000       | 57.33             | ---              | 87.00         | 29.67       | 1000.0          | 9.000           | Single Line | 20.1       |
| 28.685000       | ---               | 54.70            | 74.00         | 19.30       | 1000.0          | 9.000           | Single Line | 20.2       |
| 28.685000       | 57.68             | ---              | 87.00         | 29.32       | 1000.0          | 9.000           | Single Line | 20.2       |

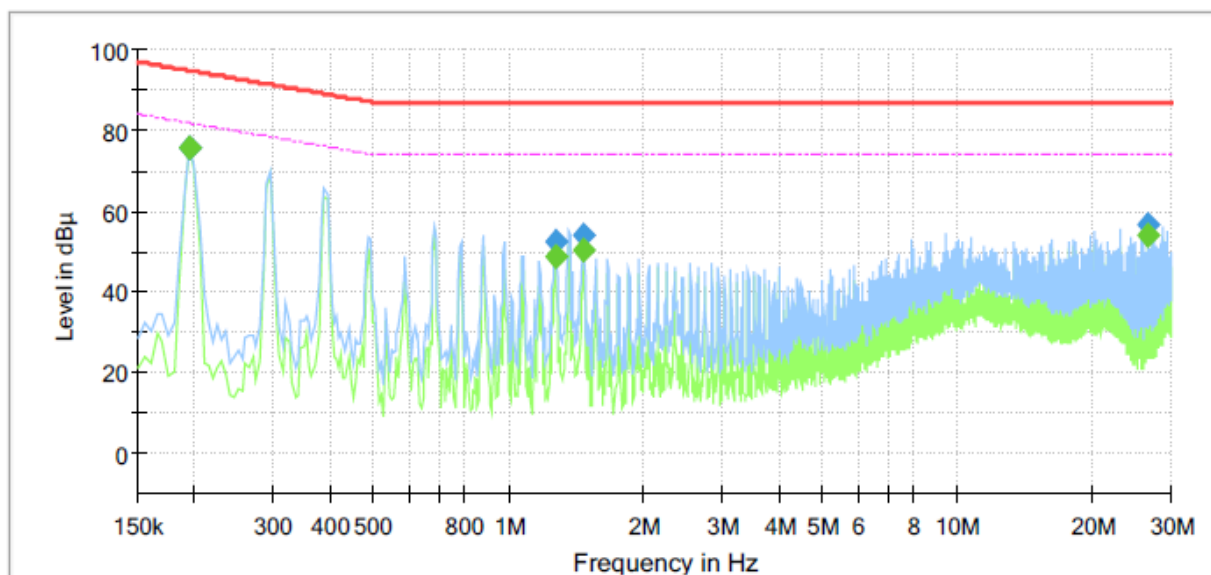


Report No. : KES-EM252068

■ mode 2

[100 Mbps]

Test Description: Telecommunication Emission  
Job No.: KES-EM252068  
Mode : Mode 2  
Speed : 100 Mbps  
Operator Name: KES



## Final\_Result

| Frequency (MHz) | QuasiPeak (dB μV) | CAverage (dB μV) | Limit (dB μV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|-------------------|------------------|---------------|-------------|-----------------|-----------------|-------------|------------|
| 0.195000        | ---               | 75.49            | 81.82         | 6.33        | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.195000        | 75.54             | ---              | 94.82         | 19.28       | 1000.0          | 9.000           | Single Line | 19.7       |
| 1.270000        | ---               | 48.56            | 74.00         | 25.44       | 1000.0          | 9.000           | Single Line | 19.4       |
| 1.270000        | 52.56             | ---              | 87.00         | 34.44       | 1000.0          | 9.000           | Single Line | 19.4       |
| 1.470000        | ---               | 50.43            | 74.00         | 23.57       | 1000.0          | 9.000           | Single Line | 19.4       |
| 1.470000        | 53.80             | ---              | 87.00         | 33.20       | 1000.0          | 9.000           | Single Line | 19.4       |
| 26.610000       | ---               | 53.79            | 74.00         | 20.21       | 1000.0          | 9.000           | Single Line | 20.1       |
| 26.610000       | 56.56             | ---              | 87.00         | 30.44       | 1000.0          | 9.000           | Single Line | 20.1       |

### ◆ Calculation

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

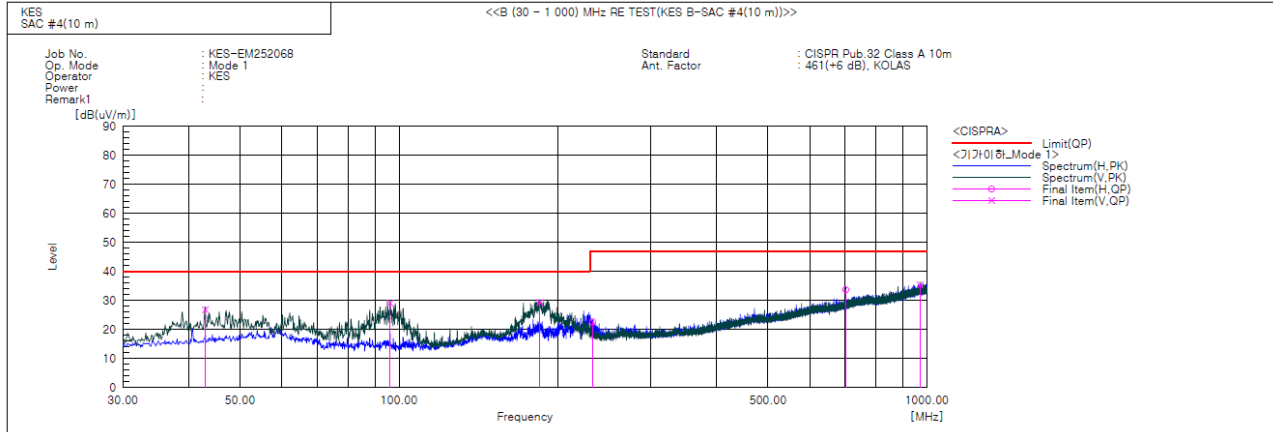
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

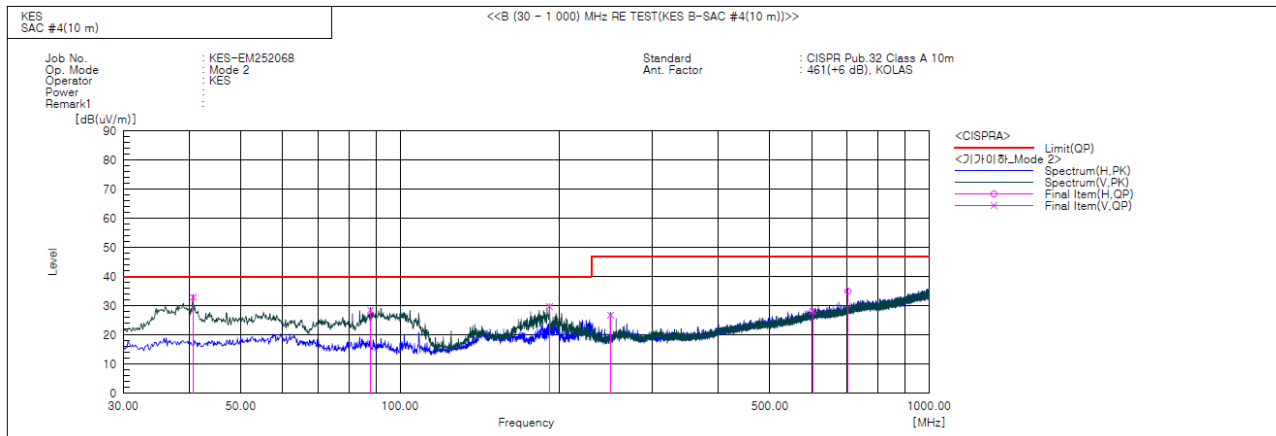
■ mode 1

**Final Result**

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(μV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(μV/m)] | Limit<br>QP<br>[dB(μV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 42.974             | V   | 48.3                      | -21.5            | 26.8                       | 40.0                      | 13.2                 | 197.0          | 271.0          |        |
| 2   | 96.203             | V   | 54.5                      | -25.5            | 29.0                       | 40.0                      | 11.0                 | 225.0          | 93.0           |        |
| 3   | 184.958            | V   | 50.5                      | -21.2            | 29.3                       | 40.0                      | 10.7                 | 199.0          | 345.0          |        |
| 4   | 232.730            | H   | 43.1                      | -20.5            | 22.6                       | 47.0                      | 24.4                 | 279.0          | 292.0          |        |
| 5   | 701.968            | H   | 38.6                      | -4.9             | 33.7                       | 47.0                      | 13.3                 | 392.0          | 357.0          |        |
| 6   | 969.566            | V   | 35.7                      | -0.3             | 35.4                       | 47.0                      | 11.6                 | 159.0          | 203.0          |        |



## mode 2



## 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   | 40.670          | V   | 54.7                | -21.8         | 32.9                 | 40.0                | 7.1            | 169.0       | 354.0       |        |
| 2   | 87.958          | V   | 54.7                | -26.2         | 28.5                 | 40.0                | 11.5           | 299.0       | 81.0        |        |
| 3   | 191.505         | V   | 51.4                | -21.7         | 29.7                 | 40.0                | 10.3           | 156.0       | 336.0       |        |
| 4   | 249.948         | V   | 46.2                | -19.4         | 26.8                 | 47.0                | 20.2           | 190.0       | 355.0       |        |
| 5   | 602.058         | V   | 35.2                | -7.0          | 28.2                 | 47.0                | 18.8           | 209.0       | 37.0        |        |
| 6   | 701.968         | H   | 39.9                | -4.9          | 35.0                 | 47.0                | 12.0           | 395.0       | 155.0       |        |

## ◆ 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)]

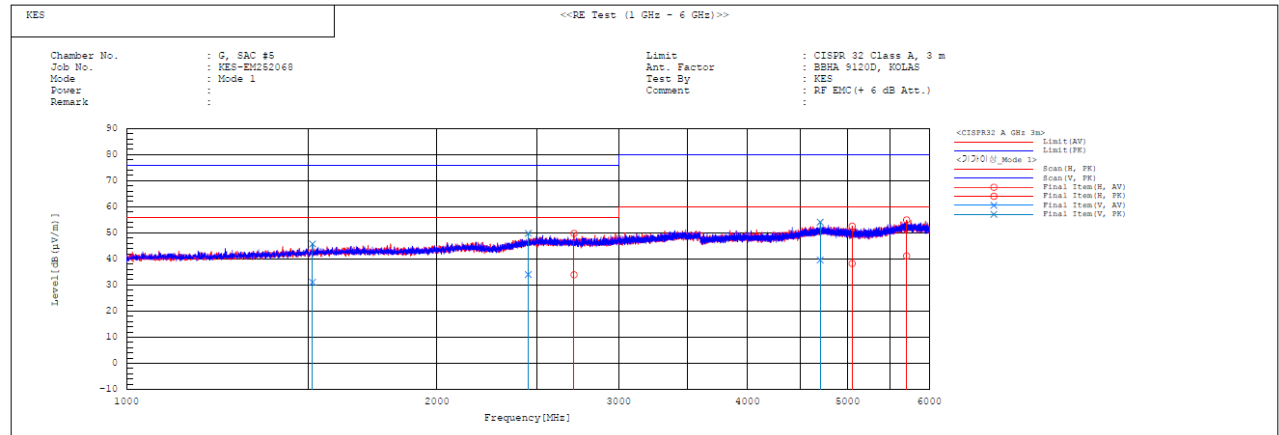
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

mode 1

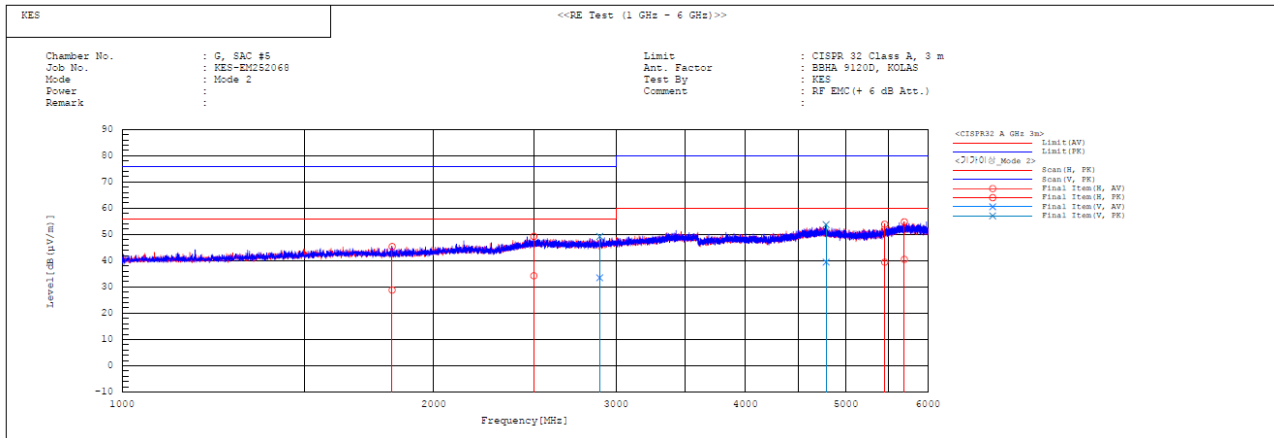


Final Result

| No. | Frequency | Pol | Reading<br>AV | Reading<br>PK | c.f       | Result<br>AV | Result<br>PK | Limit<br>AV | Limit<br>PK | Margin<br>AV | Margin<br>PK | Height | Angle | Remark |
|-----|-----------|-----|---------------|---------------|-----------|--------------|--------------|-------------|-------------|--------------|--------------|--------|-------|--------|
|     | [MHz]     |     | [dB(μV)]      | [dB(μV)]      | [dB(1/m)] | [dB(μV/m)]   | [dB(μV/m)]   | [dB(μV/m)]  | [dB(μV/m)]  | [dB]         | [dB]         | [cm]   | [deg] |        |
| 1   | 1515.211  | V   | 29.9          | 44.5          | 1.2       | 31.1         | 45.7         | 56.0        | 76.0        | 24.9         | 30.3         | 100.0  | 133.3 |        |
| 2   | 2452.370  | V   | 29.2          | 45.0          | 4.8       | 34.0         | 49.8         | 56.0        | 76.0        | 22.0         | 26.2         | 100.0  | 278.6 |        |
| 3   | 2715.367  | H   | 28.3          | 44.2          | 5.6       | 33.9         | 49.8         | 56.0        | 76.0        | 22.1         | 26.2         | 100.0  | 13.8  |        |
| 4   | 4705.487  | V   | 28.1          | 42.6          | 11.5      | 39.6         | 54.1         | 60.0        | 80.0        | 20.4         | 25.9         | 100.0  | 189.5 |        |
| 5   | 5052.213  | H   | 25.5          | 39.8          | 12.7      | 38.2         | 52.5         | 60.0        | 80.0        | 21.8         | 27.5         | 100.0  | 4.0   |        |
| 6   | 5704.459  | H   | 27.2          | 41.0          | 13.9      | 41.1         | 54.9         | 60.0        | 80.0        | 18.9         | 25.1         | 100.0  | 26.5  |        |



## mode 2



## ◆ Calculation

$$\text{Result(PK/CAV)} [\text{dB}(\mu\text{V/m})] = (\text{Reading(PK/CAV)}[\text{dB}(\mu\text{V})] + \text{c.f}[\text{dB}(1/\text{m})])$$
$$\text{Margin(PK/CAV)}[\text{dB}] = \text{Limit}[\text{dB}(\mu\text{V/m})] - \text{Result(PK/CAV)} [\text{dB}(\mu\text{V/m})]$$

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



## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

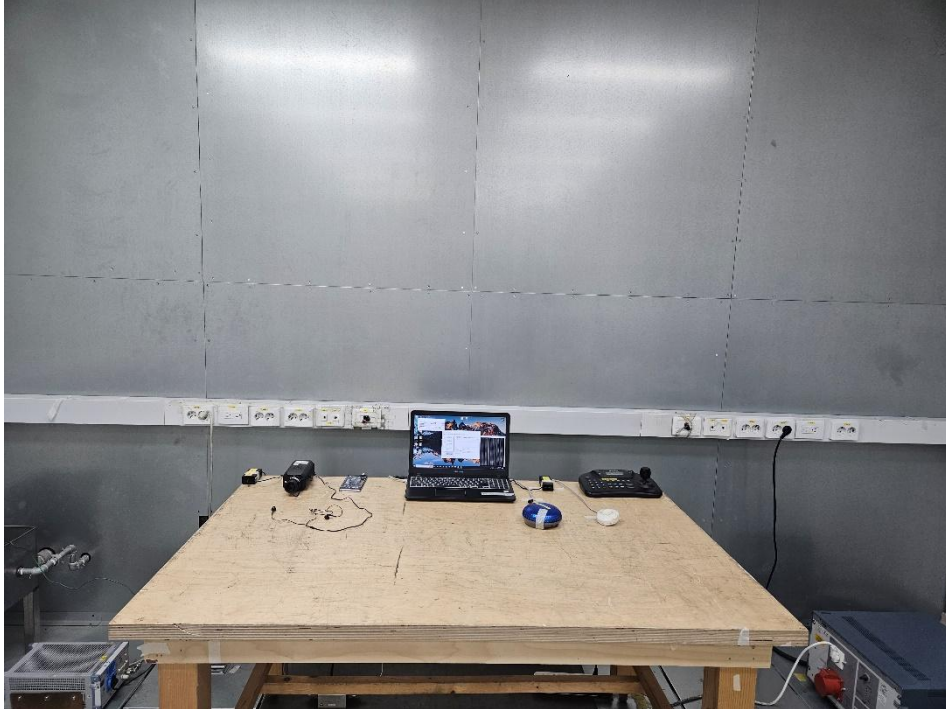
■ mode 1





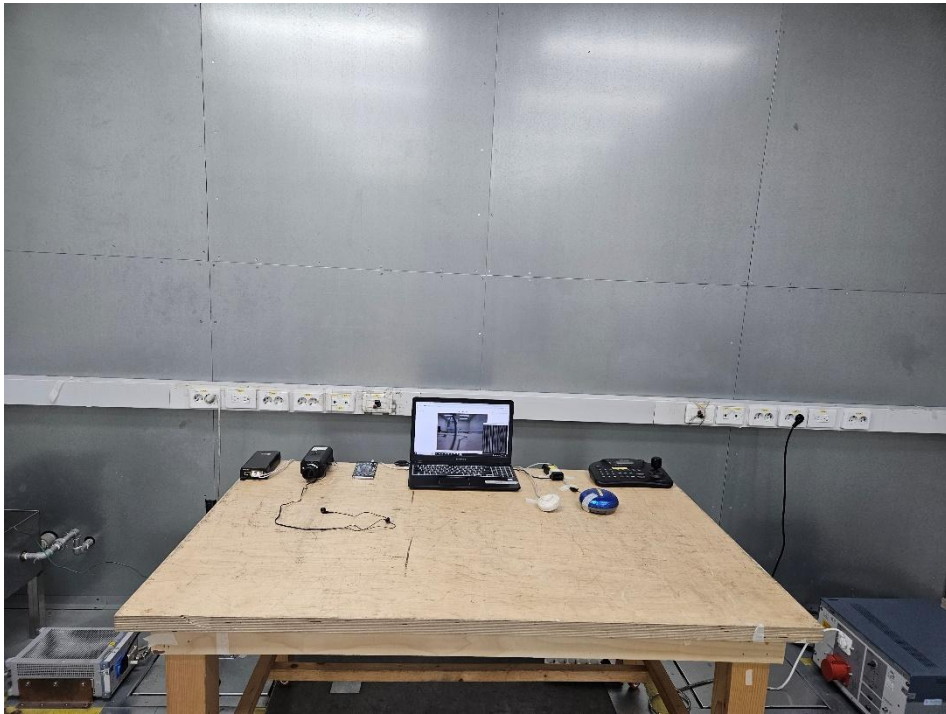
## Conducted Emissions at Telecommunication Ports

■ mode 1





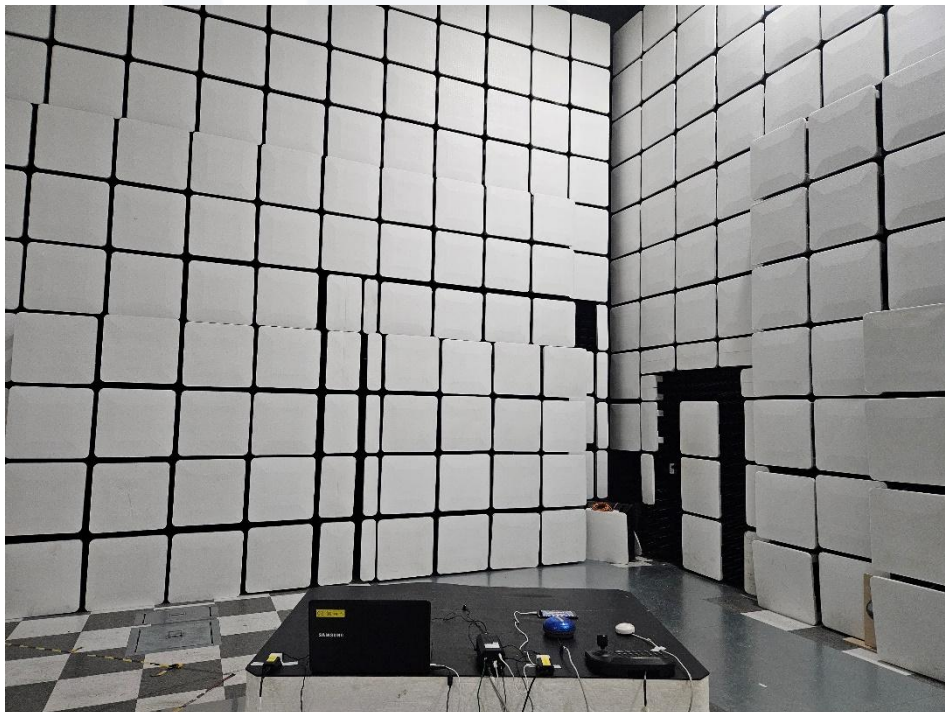
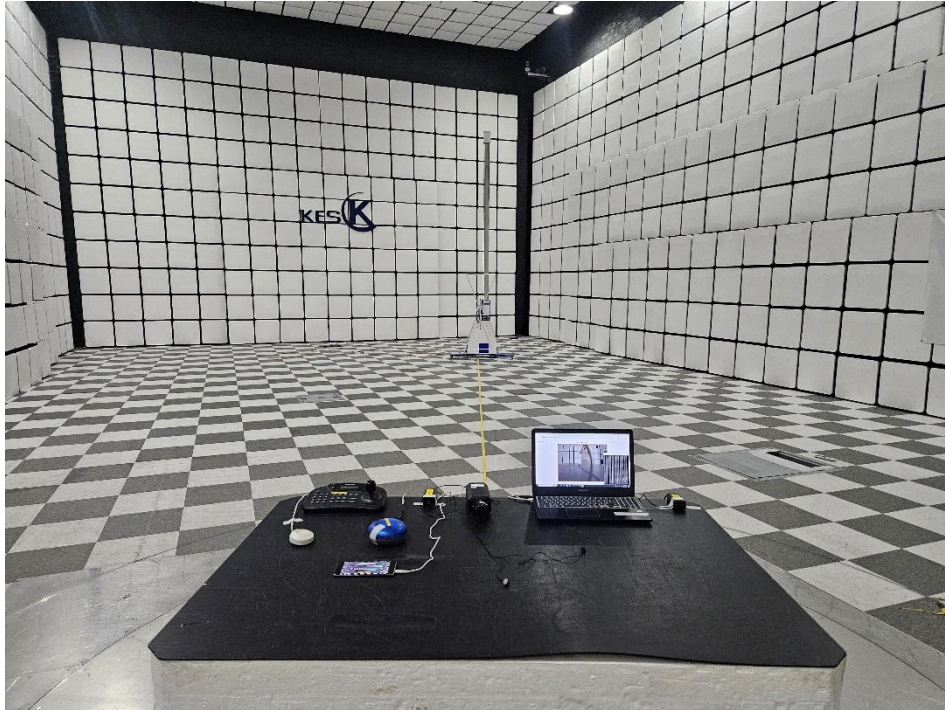
■ mode 2





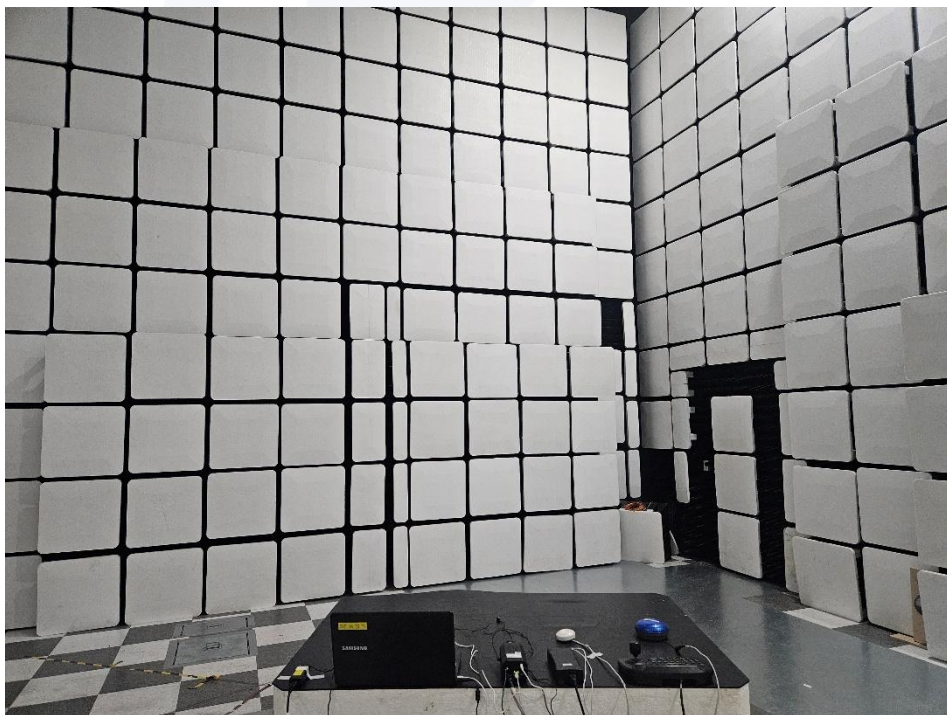
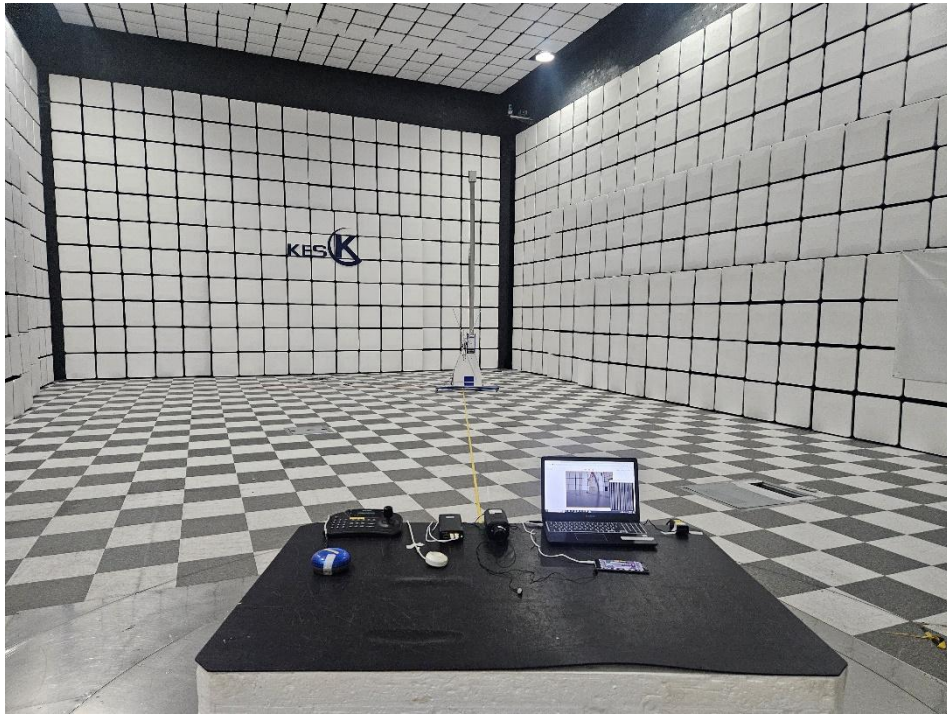
## Radiated Electric Field Emissions(Below 1 GHz)

■ mode 1





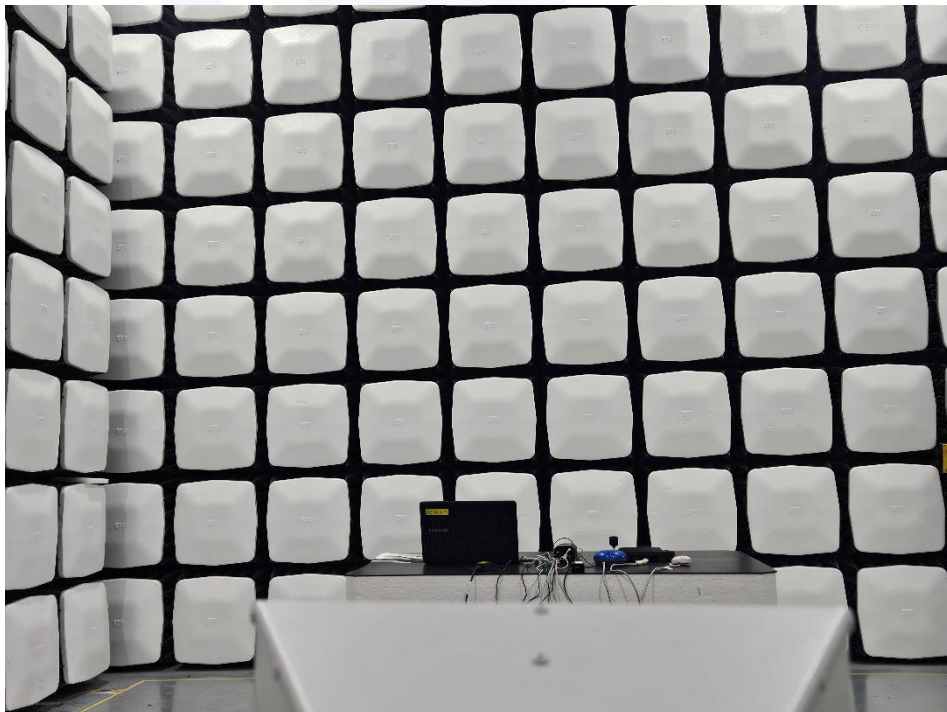
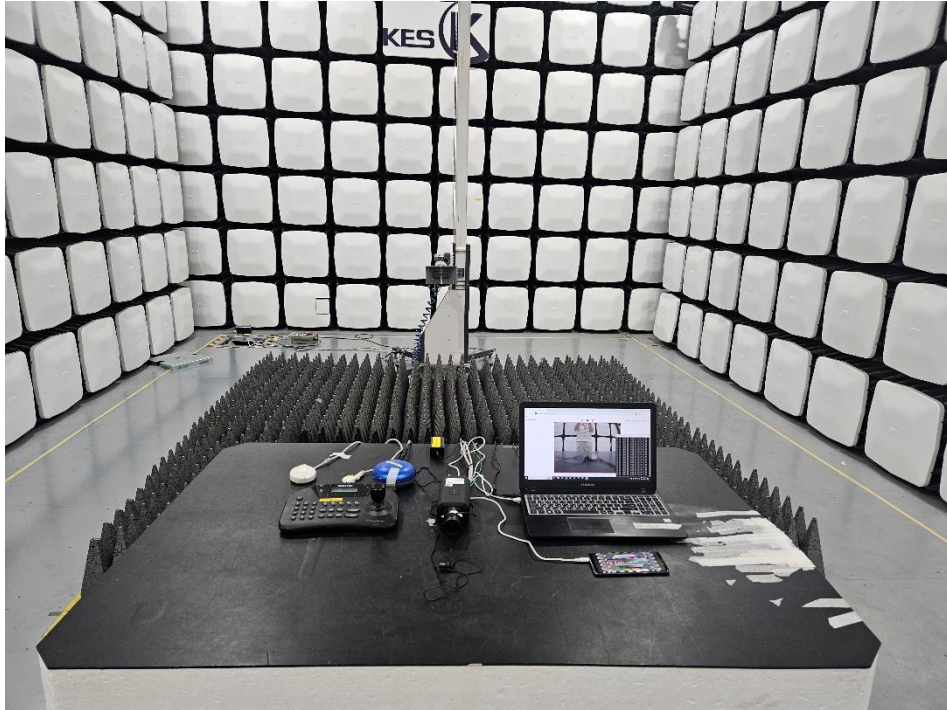
■ mode 2





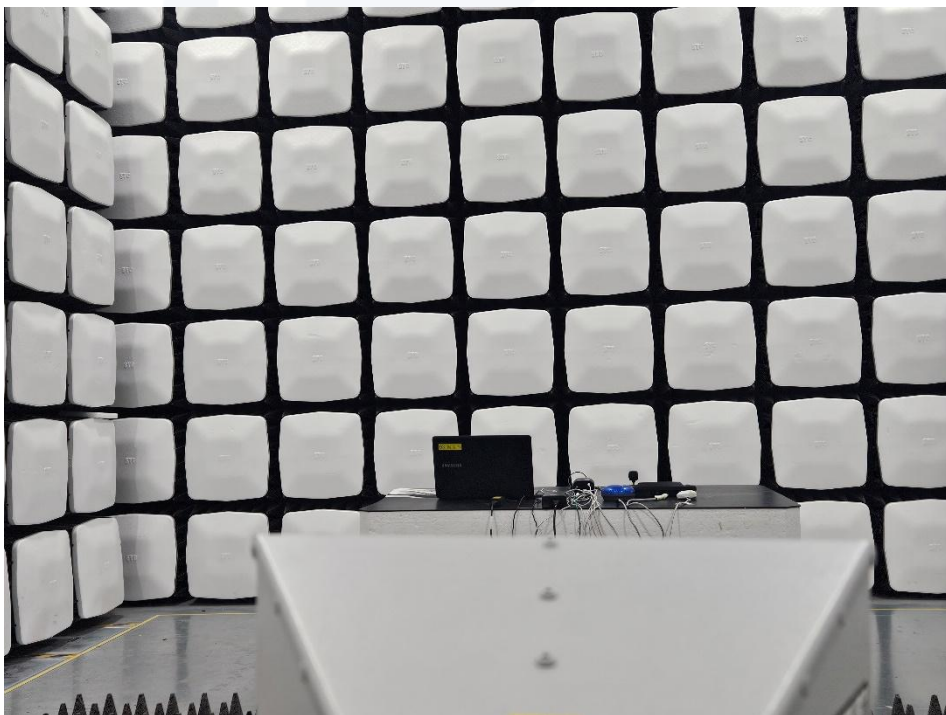
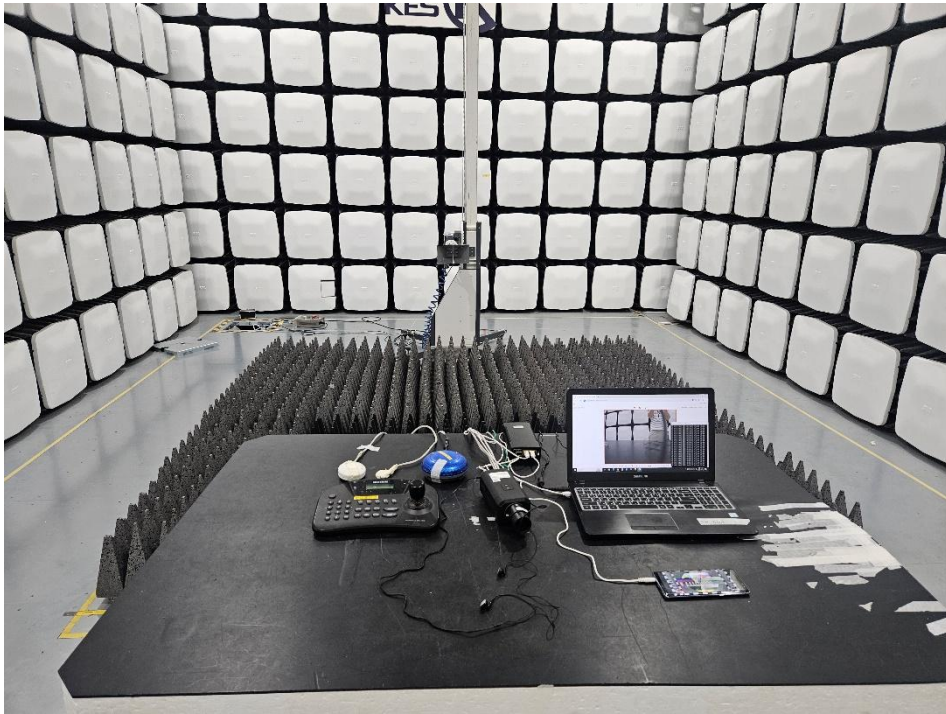
## Radiated Electric Field Emissions(Above 1 GHz)

■ mode 1





■ mode 2





## EUT External Photographs

(Top)



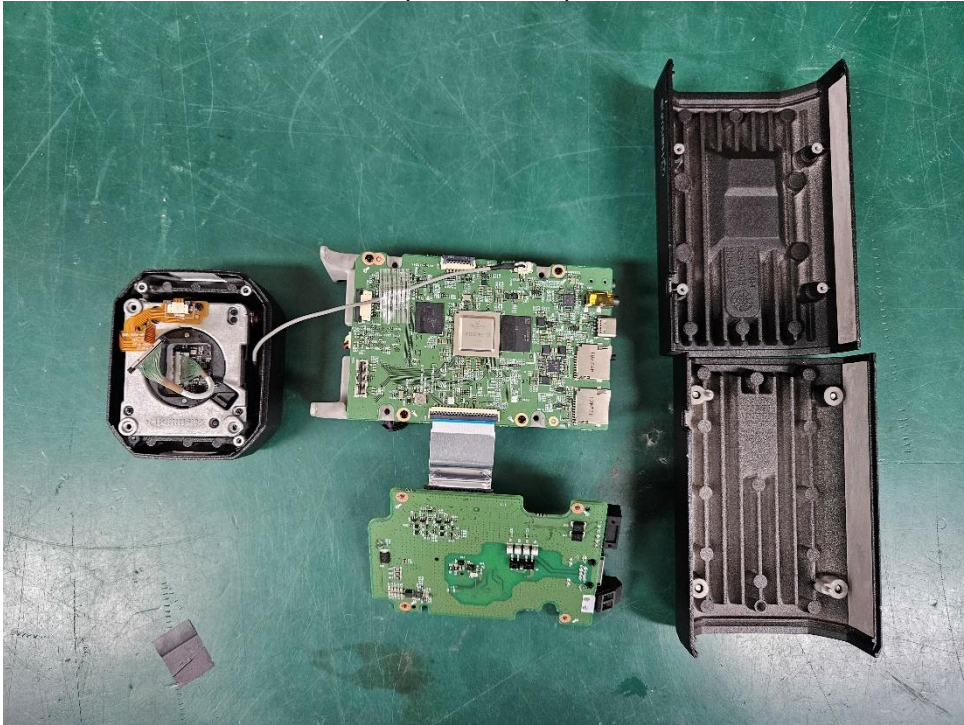
(Bottom)



## EUT Internal Photographs



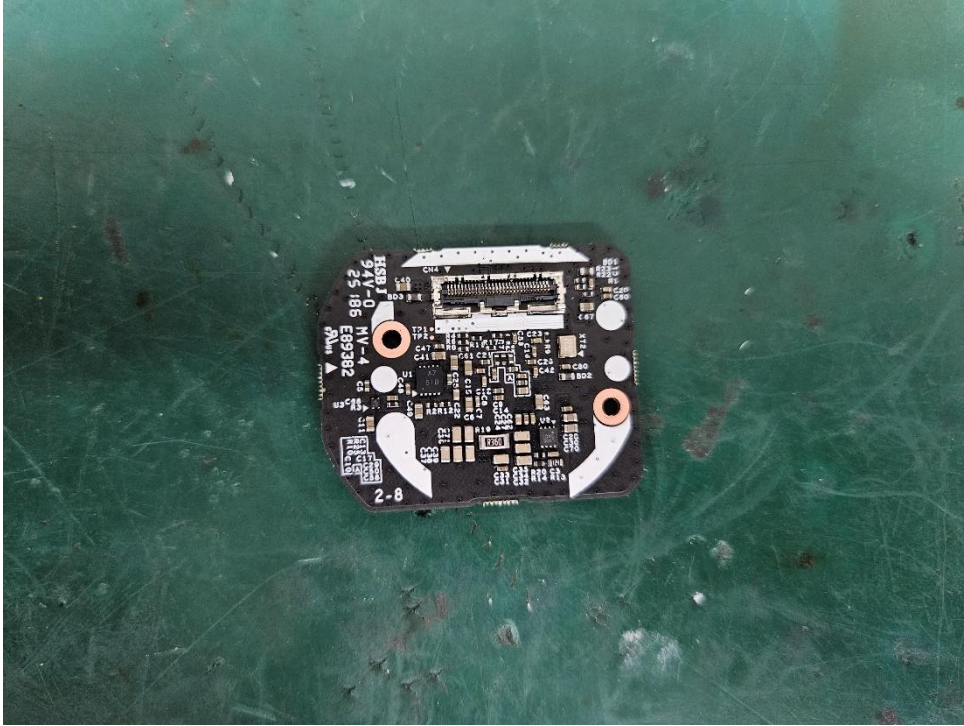
(Internal View)



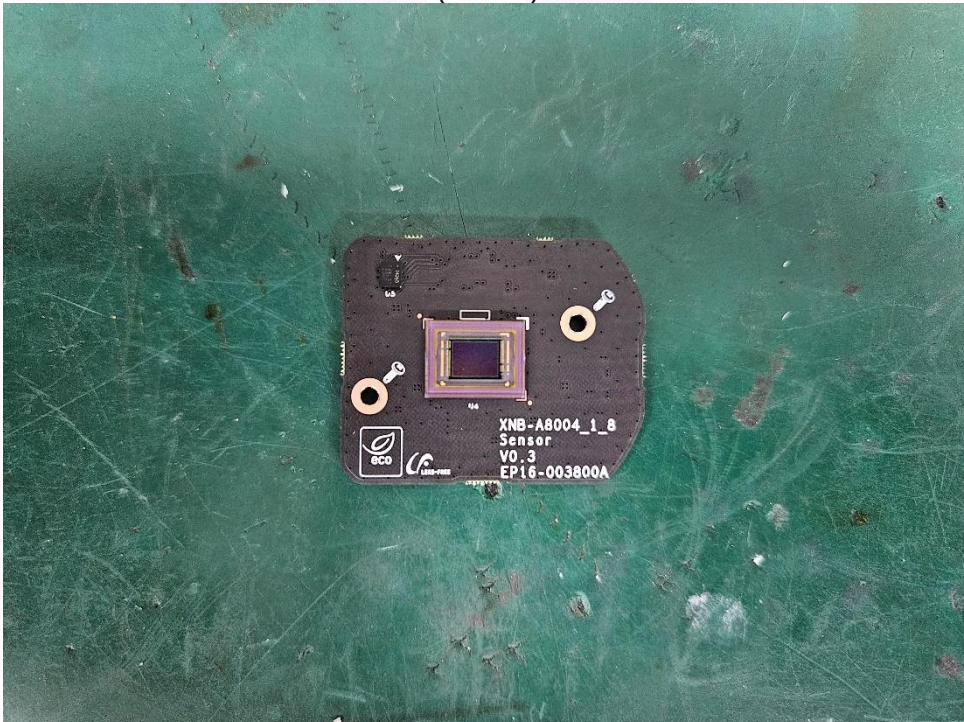


## EUT Internal View – Board 1

(Top)



(Bottom)



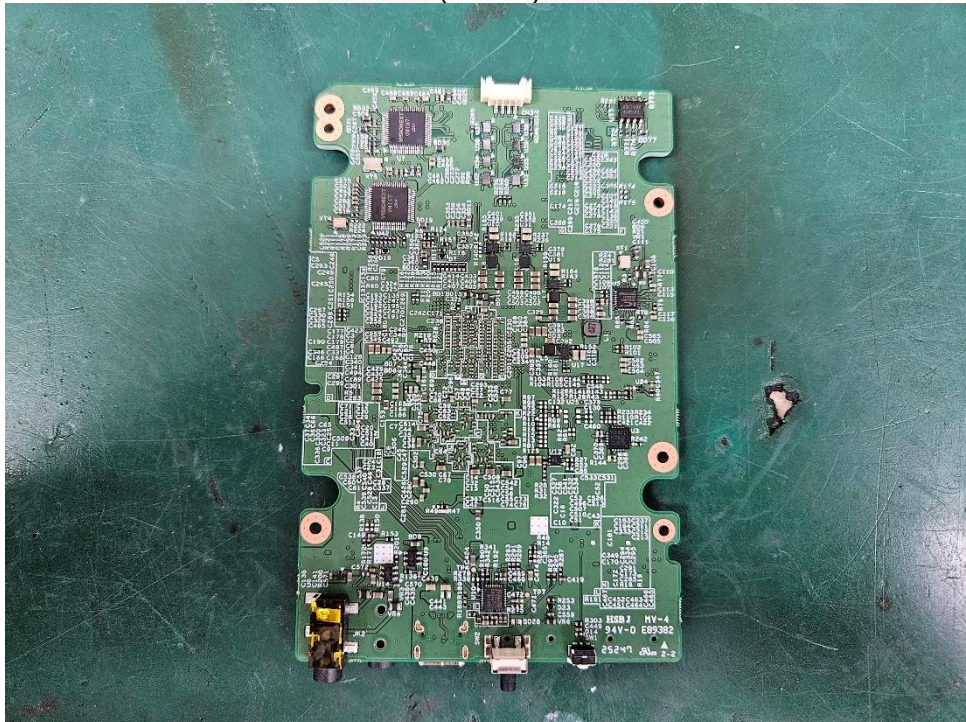


## EUT Internal View – Board 2

(Top)



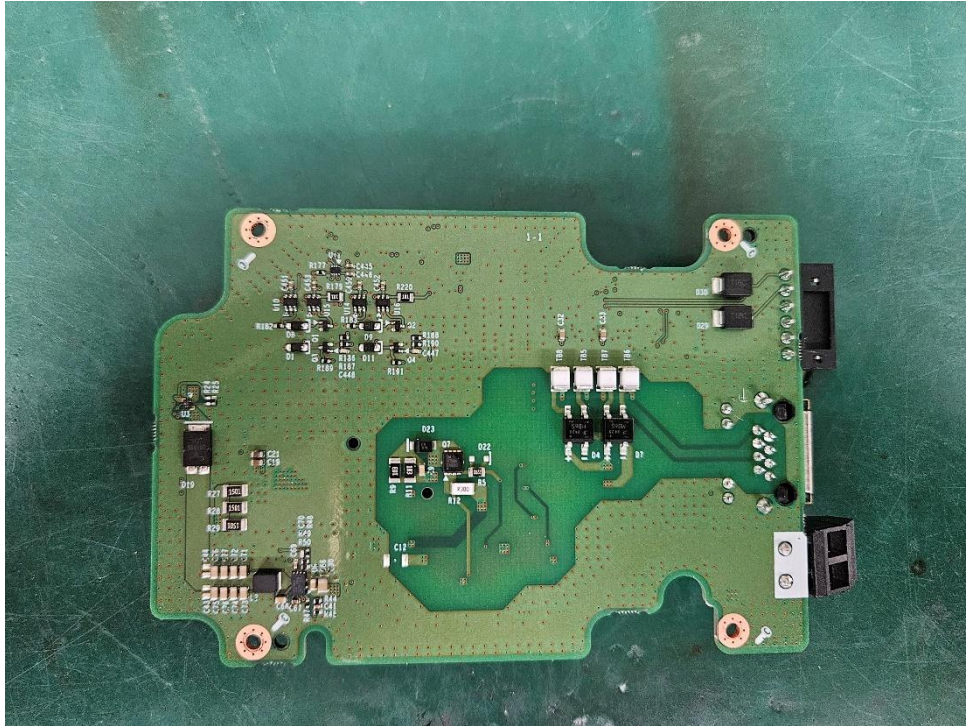
(Bottom)



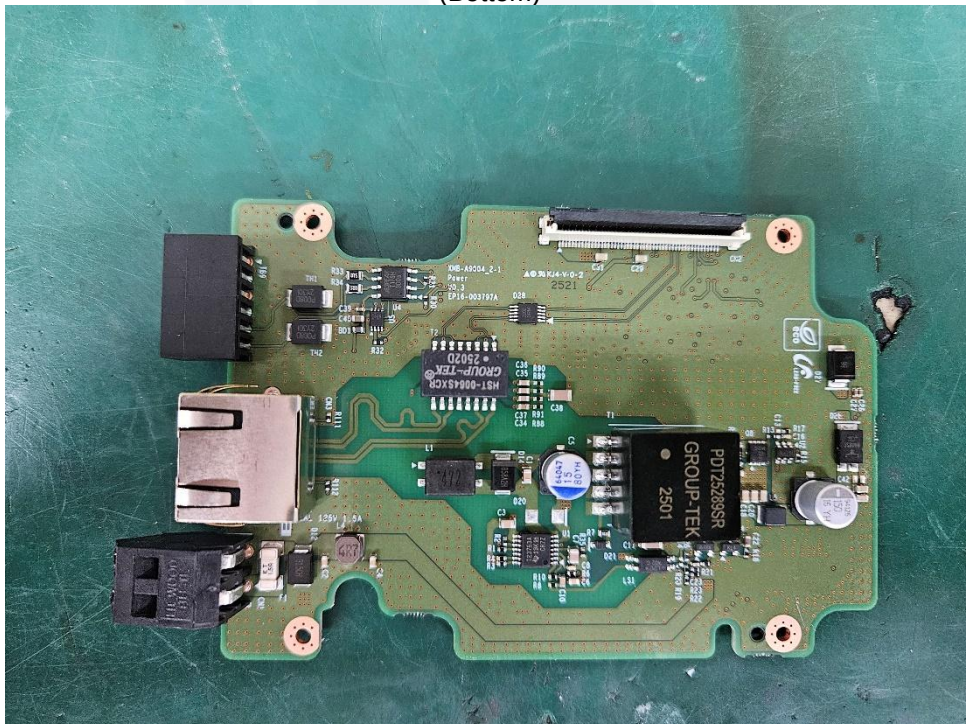


### EUT Internal View – Board 3

(Top)



(Bottom)





### EUT Internal View – Speaker

(Top)



(Bottom)



The End.