



# TEST REPORT



Report No. : KES-EM243527

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**KES Co., Ltd.**

#3002, #3503, #3701, 40, Simin-daero365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Republic of Korea  
Tel : +82-31-425-6200, Fax : +82-31-381-3838

## 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. : TNV-C8014RM

Variant Model : TNV-C8034RM, SPG-VAN23W

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 : Oct. 15, 2024

4. Test date : Oct. 24, 2024 ~ Nov. 03, 2024

5. Date of Issue : Nov. 14, 2024

6. Test Results : In Compliance

*Tested by*

*Reviewed by*

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Jae Won, Lee  
EMC Test Engineer

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Dae Jung, Choi  
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 |
|---------------|-----------------|------------------|
| Nov. 14, 2024 | KES-EM243527    | Issued           |
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## 1.0 General Product Description

### Main Specifications of EUT are:

Internal highest operating frequency : 1.866 Mhz

|                                       |   |
|---------------------------------------|---|
| <b>Mechanical</b>                     |   |
| Color / Material                      | White / Aluminum  |
| RAL Code                              | RAL9003   |
| Product Dimensions / Weight           | 106x105x55mm(4.17x4.13x2.17"), 466g(1.03 lb)  |
| <b>Certifications &amp; Standards</b> |   |
| Network                               | None  |
| EMC                                   | FCC 47 CFR 15 Subpart B Class A<br>ICES-3(A)/NMB-3(A)<br>CE/UKCA<br>- EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3<br>VCCI CISPR 32 Class A<br>RCM AS/NZS CISPR 32 Class A<br><b>Railway/Vehicle Application</b><br><b>EN50121-4, EN50121-3-2</b> |
| Safety                                | UL 62368-1, CAN/CSA C22.2 NO. 62368-1<br>IEC/EN 62471   |
| Environment                           | IEC/EN 63000<br>IEC/EN 60529 IP66, IEC/EN 62262 IK10<br><b>Railway/Vehicle Application</b><br>JIS E 5006, IEC62236-3-2,<br>IEC62236-4, EN50121-4, , JIS E 4031, EN50498,<br>EN50155,<br>IEC/EN61373,<br>EN45545-2 HL3,  |
| Video                                 | None  |
| <b>Compatible Models</b>              |   |
| Dome Cover                            | SPB-VAN23W, SPG-VAN23W  |
| Other Compatible Models               | SBD-110GPA  |
| <b>DORI (EN62676-4 standard)</b>      |   |
| Detect (25PPM/ 8PPF)                  | 43.5m(142.71ft)   |
| Observe (63PPM/ 19PPF)                | 17.5m(57.09ft)  |
| Recognize (125PPM/ 38PPF)             | 8.7m(28.54ft)   |
| Identify (250PPM/ 76PPF)              | 4.3m(14.27ft)   |



|   |  |
|---|--|
| 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/SFTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT |
| SIP support (VoIP, Peer-to-peer, SIP/PB | None   |
| Security                                | None   |
| Application Programming Interface       | ONVIF Profile S/G/T/M<br>SUNAPI(HTTP API)<br><b>Hanwha Vision Open Platform</b>  |
| <b>Security</b>                         |  |
| 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)   |
| Access Control                          | IP-based access control  |
| Data Protect                            | Encryption credentials, Encrypt compress for live recording file   |
| Audit                                   | Access / System / Event Log management   |
| Device ID                               | Device certificate(Hanwha Vision Root CA)  |
| Secure Storage                          | SDcard partition encrypt   |
| Security Certificate                    | None   |
| <b>General</b>                          |  |
| Webpage Language                        | English, Korean, Simplified Chinese, Traditional Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek   |
| Web Viewer                              | None   |
| Edge Storage                            | Micro SD/SDHC/SDXC 1slot 256GB   |
| Memory                                  | 2GB RAM, 1GB Flash   |
| <b>Environmental &amp; Electrical</b>   |  |
| Operating Temperature / Humidity        | -40°C~+55°C(-40°F~+131°F) / 0~100% RH(Condensing)<br>* Start up should be done at above -30°C<br>Humidity control /w Air vapor control   |
| Storage Temperature / Humidity          | -40°C~+55°C(-40°F~+131°F) / 0~95% RH   |
| Wind Load                               | None   |
| EPA(Effective Projected Area)           | None   |
| Certification                           | IP66, IK10   |
| Input Voltage                           | PoE(IEEE802.3af, Class3)   |
| Power Consumption                       | PoE: Max 7.2W, typical 4.2W  |



|                          |  |
|--------------------------|--|
| Digital PTZ              | Support  |
| Video Rotation           | Flip, Mirror, Hallway view(90°/270°)   |
| Analytics                | <p>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 <b>BestShot</b><br/>Analytics events based on AI engine<br/>- Motion detection*, Object detection, Virtual line*(Crossing/Direction),<br/>Virtual area*(Loitering/Intrusion/Enter/Exit)<br/>Analytics events<br/>- Defocus detection, Tampering, <b>Shock detection</b>, Virtual<br/>area(Appear/Disappear)</p> <p>* Some of the video analytics only works with people and vehicle detection</p> |
| Business Intelligence    | Based on AI engine: People counting, Vehicle counting, Queue management, Heatmap   |
| Serial Interface         | None   |
| Alarm I/O                | None   |
| Alarm Triggers           | Analytics, Network disconnect, <b>MQTT subscription</b>  |
| Alarm Events             | <p>When alarm trigger occurred<br/>- File upload(image) : e-mail/FTP/SFTP<br/>- Notification : e-mail<br/>- Recording : SD/SDHC/SDXC or NAS recording at event triggers<br/>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP/Custom String)<br/>- Audio clip playback<br/>- MQTT: publication</p>   |
| Audio Streaming          | None   |
| Audio In                 | Selectable(Mic in/Line in/Built-in mic)  |
| Audio Out                | Line out   |
| Light Type               | IR LED (850nm)   |
| Light Viewable Length    | 20m(65.62ft) (QA컨셉대기종)   |
| <b>Network</b>           |  |
| Ethernet                 | M12(10/100BASE-T)  |
| Video Compression        | H.265/H.264: Main/High, MJPEG  |
| Audio Compression        | <p>G.711 u-law /G.726 selectable<br/>G.726(ADPCM) 8KHz, G.711 8KHz<br/>G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps<br/>AAC-LC: 48Kbps at 16KHz</p>   |
| Smart Codec              | Manual(5ea area), WiseStreamⅢ(Based on AI engine)  |
| Video Quality Adjustment | <p>H.264/H.265: Target bitrate level control<br/>MJPEG: Quality Level control</p>  |



|                             |   |
|-----------------------------|---|
| <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           | <b>Color: 0.03Lux (F1.6, 1/30sec)</b><br><b>BW: 0.003Lux (F1.6, 1/30sec, 30IRE), 0Lux(IR LED on)</b>                        |
| Video Out                   | USB: Micro USB Type B, 1280x720 for installation  |
| <b>Lens</b>                 |   |
| Focal Length (Zoom Ratio)   | 3.0mm fixed focal   |
| Max. Aperture Ratio         | F1.6  |
| Angular Field of View       | H: 100°/ V: 73°/ D: 129°  |
| 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   | ±5° / 0°~67° / ±90°   |
| <b>Operational</b>          |   |
| Camera Title                | Displayed up to 85 characters   |
| Day & Night                 | Auto(ICR)   |
| Backlight Compensation      | BLC, WDR, SDR, <b>Clear HDR</b>   |
| Wide Dynamic Range          | 120dB   |
| Digital Noise Reduction     | WiseNRⅡ(Based on AI engine)<br>SSNRV  |
| Digital Image Stabilization | <b>Support(built-in gyro sensor)</b>  |
| Defog                       | <b>Support : Manual</b>   |
| Motion Detection            | 8ea, 8point polygonal zones   |
| Privacy Masking             | 32ea, 4point quadrangle zones<br>- Color: Gray/Green/Red/Blue/Black/White<br><b>Dynamic Privacy Mask</b><br>- <b>Mosaic</b> |
| 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)                            |



## 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.

☒ PoE

## 1.2 Variant Model Differences

- TNV-C8034RM : Fixed Lens Difference
- SPG-VAN23W : Add derivative model for vendor management

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                           | Remarks |
|----------------|--------------|---------------|--|---------|
| NETWORK CAMERA | TNV-C8014RM  | -             | 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.   | -       |
| PoE Injector          | PT-PSE109GBRO-AH | -             | Dongguan PROCET Network Technology Co.,Ltd | -       |
| Headset               | K550             | -             | Britz®                                     | -       |
| Smartphone            | -                | -             | SAMSUNG                                    | -       |
| 4 Pin to RJ-45 Gender | -                | -             | -  | -       |
| Micro SD Card         | -                | -             | SanDisk                                    | 16 GB   |





## 1.6 External I/O Cabling

| Start                 |                    | END                   |                    | Cable Spec. |        |
|-----------------------|--------------------|-----------------------|--------------------|-------------|--------|
| Description           | I/O Port           | Description           | I/O Port           | Length      | Shield |
| NETWORK CAMERA (EUT)  | 4 Pin              | 4 Pin to RJ-45 Gender | 4 Pin              | -           | -      |
|                       | Audio IN           | Headset               | Audio OUT          | 1.5         | U      |
|                       | Audio OUT          |                       | Audio IN           | 1.5         | U      |
|                       | Micro SD Card Slot | Micro SD Card         | Micro SD Card Slot | -           | -      |
| 4 Pin to RJ-45 Gender | RJ-45(PoE)         | PoE Injector          | RJ-45(PoE)         | 3.5         | U      |
| PoE Injector          | RJ-45(LAN)         | Laptop                | RJ-45(LAN)         | 2.0         | U      |
| Laptop                | DC Jack            | Laptop Adapter        | DC Jack            | 1.6         | U      |
| Laptop                | 3.5 mm             | Smartphone            | 3.5 mm             | 1.0         | U      |

\* Unshielded=U, Shielded=S

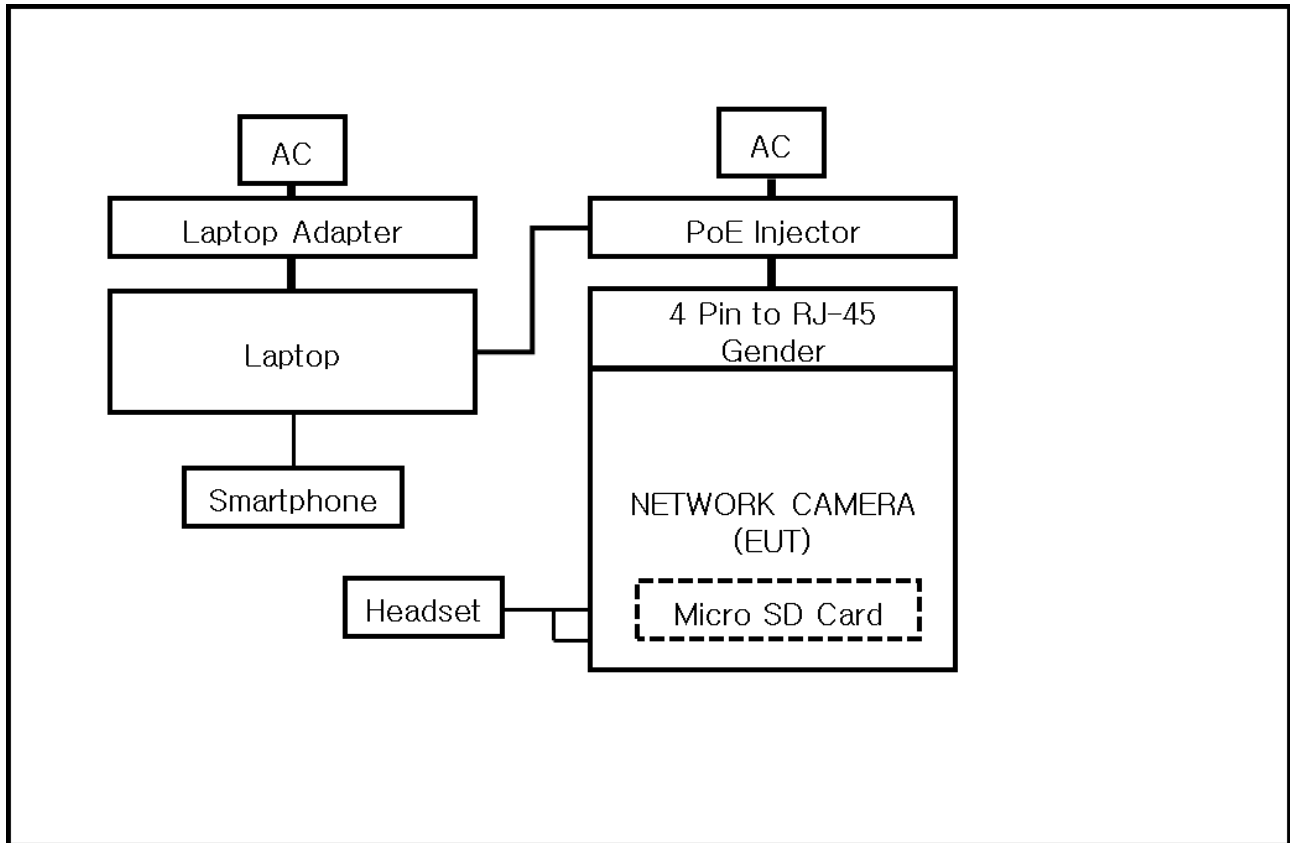
## 1.7 EUT Operating Mode(s)

| Test mode | Normal operating   |
|-----------|--|
| Operating | <ol style="list-style-type: none"><li>1. Connect to the web viewer and test while checking the video output of the test equipment.</li><li>2. Run the Ping Test to check whether the network of the test equipment is operating normally.</li><li>3. Confirm normal output from the headset by outputting 1 kHz Tone.</li><li>4. Activate the microphone in the web viewer to check if the microphone is in normal condition.</li><li>5. Check whether the recording file is saved on the Micro SD Card before/after the test.</li></ol> |

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



## 1.8 Configuration





## 1.9 Remarks when standards applied

- It receives PoE power, and the PoE port is considered a wired network port. Test items related to the power port are not applicable.
- The Micro 5 Pin port is not tested as it is for administrator use.
- Administrator port photo



## 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              | ESH2-Z5      | R & S        | 100450        | 11, 08, 2024 |
| <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**

Oct. 24, 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              | ESH2-Z5      | R & S        | 100450        | 11, 08, 2024 |
| <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 |

**Test Conditions**

Temperature: (24,1 ± 0,1) °C

Relative Humidity: (47,0 ± 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**

Nov. 03, 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"/> | BILOG ANTENNA     | VULB 9168    | SCHWARZBECK      | 9168-461      | 05, 09, 2026 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 6806.17.A    | HUBER+SUHNER     | -             | 02, 13, 2025 |

**Test Conditions**

Temperature: (23,4 ± 0,1) °C

Relative Humidity: (45,0 ± 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**

Oct. 25, 2024

**Test Location**

SEMI ANECHOIC CHAMBER #5

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | ES10/RE      | TOYO Corporation | 2022.01.000   | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | Rohde & Schwarz  | 100552        | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | BBHA 9120D   | SCHWARZBECK      | 9120D-1802    | 11, 03, 2024 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER      | 8449B        | HP               | 3008A00538    | 04, 30, 2025 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 8491B        | HP               | 23094         | 02, 13, 2025 |

**Test Conditions**

Temperature: (22,8 ± 0,1) °C

Relative Humidity: (46,2 ± 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

HOT LINE

N/A



NEUTRAL LINE

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

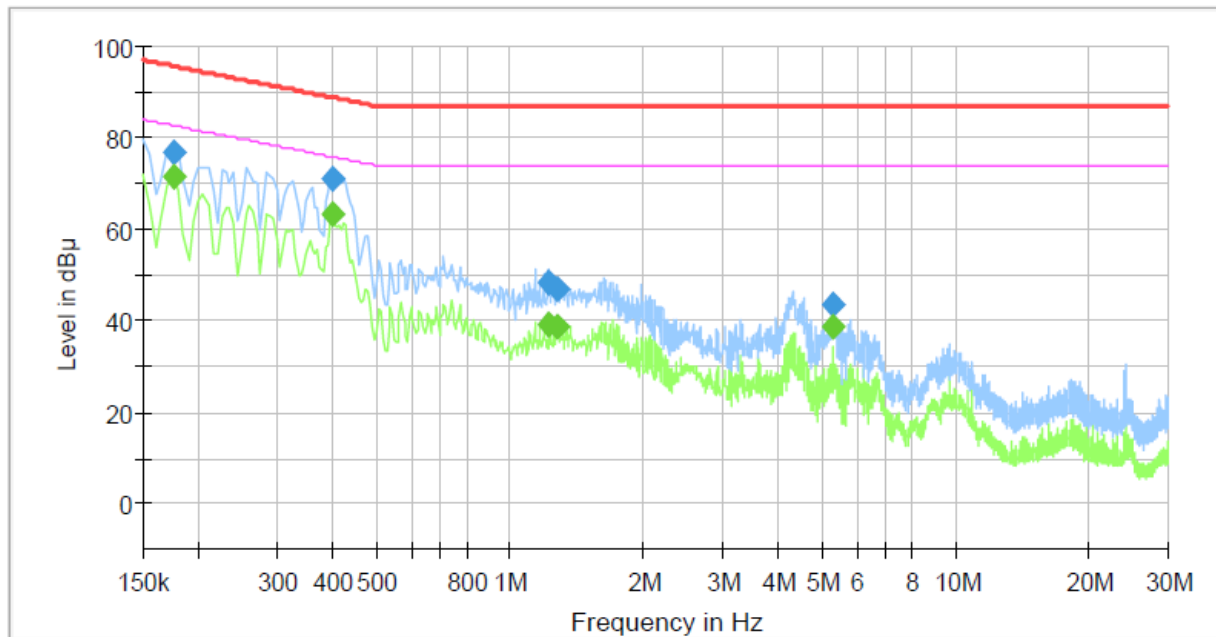
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))



## Conducted Emissions at Telecommunication Ports [100 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Job No.: KES-EM243527  
Mode : TEL 100 Mbps  
Speed :  
Operator Name: KES



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.175000        | ---              | 71.32           | 82.72        | 11.40       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.175000        | 77.02            | ---             | 95.72        | 18.70       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.400000        | ---              | 63.35           | 75.85        | 12.50       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.400000        | 71.25            | ---             | 88.85        | 17.60       | 1000.0          | 9.000           | Single Line | 19.6       |
| 1.225000        | ---              | 39.23           | 74.00        | 34.77       | 1000.0          | 9.000           | Single Line | 19.5       |
| 1.225000        | 48.46            | ---             | 87.00        | 38.54       | 1000.0          | 9.000           | Single Line | 19.5       |
| 1.280000        | ---              | 38.80           | 74.00        | 35.20       | 1000.0          | 9.000           | Single Line | 19.5       |
| 1.280000        | 46.77            | ---             | 87.00        | 40.23       | 1000.0          | 9.000           | Single Line | 19.5       |
| 5.295000        | ---              | 38.71           | 74.00        | 35.29       | 1000.0          | 9.000           | Single Line | 19.7       |
| 5.295000        | 43.40            | ---             | 87.00        | 43.60       | 1000.0          | 9.000           | Single Line | 19.7       |

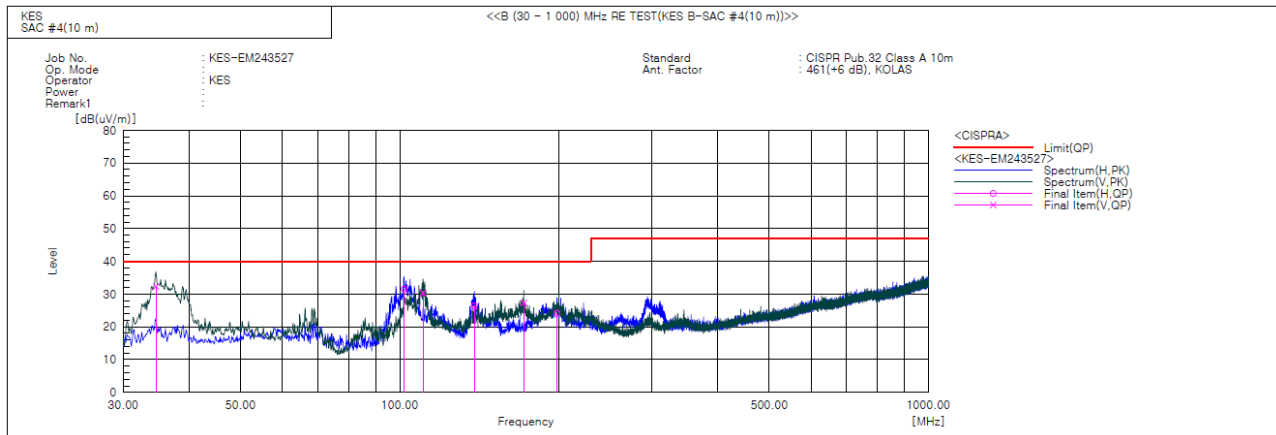
#### ◆ Calculation

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<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   | 34.608             | V   | 54.7                      | -22.4            | 32.3                       | 40.0                      | 7.7                  | 114.0          | 251.0          |        |
| 2   | 101.901            | H   | 56.2                      | -24.7            | 31.5                       | 40.0                      | 8.5                  | 195.0          | 116.0          |        |
| 3   | 110.753            | V   | 53.8                      | -23.5            | 30.3                       | 40.0                      | 9.7                  | 141.0          | 114.0          |        |
| 4   | 138.398            | H   | 46.8                      | -20.4            | 26.4                       | 40.0                      | 13.6                 | 196.0          | 328.0          |        |
| 5   | 171.620            | V   | 47.6                      | -20.3            | 27.3                       | 40.0                      | 12.7                 | 117.0          | 303.0          |        |
| 6   | 198.295            | H   | 46.1                      | -22.0            | 24.1                       | 40.0                      | 15.9                 | 395.0          | 50.0           |        |

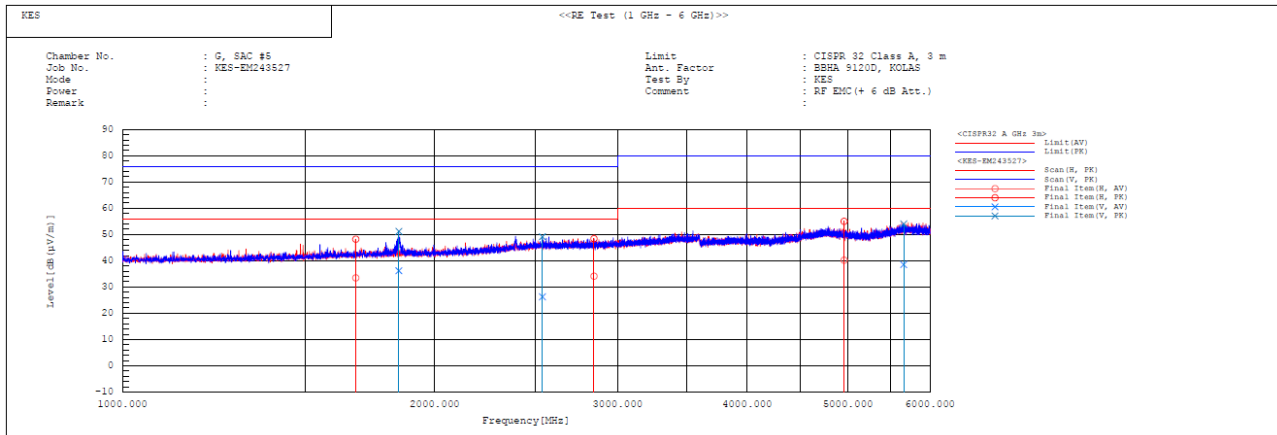
**◆ Calculation**

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

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

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

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

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

| No. | Frequency [MHz] | Pol | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 1678.465        | H   | 32.0                | 46.7                | 1.5           | 33.5                 | 48.2                 | 56.0                | 76.0                | 22.5           | 27.8           | 100.0       | 284.2       |        |
| 2   | 1846.978        | V   | 34.0                | 49.0                | 2.2           | 36.2                 | 51.2                 | 56.0                | 76.0                | 19.8           | 24.8           | 100.0       | 300.7       |        |
| 3   | 2539.597        | V   | 21.4                | 44.2                | 4.9           | 26.3                 | 49.1                 | 56.0                | 76.0                | 29.7           | 26.9           | 100.0       | 293.2       |        |
| 4   | 2847.469        | H   | 28.3                | 42.6                | 5.8           | 34.1                 | 48.4                 | 56.0                | 76.0                | 21.9           | 27.6           | 100.0       | 0.8         |        |
| 5   | 4960.124        | H   | 27.9                | 42.7                | 12.3          | 40.2                 | 55.0                 | 60.0                | 80.0                | 19.8           | 25.0           | 100.0       | 291.7       |        |
| 6   | 5659.997        | V   | 25.0                | 40.5                | 13.5          | 38.5                 | 54.0                 | 60.0                | 80.0                | 21.5           | 26.0           | 100.0       | 113.8       |        |

**◆ 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



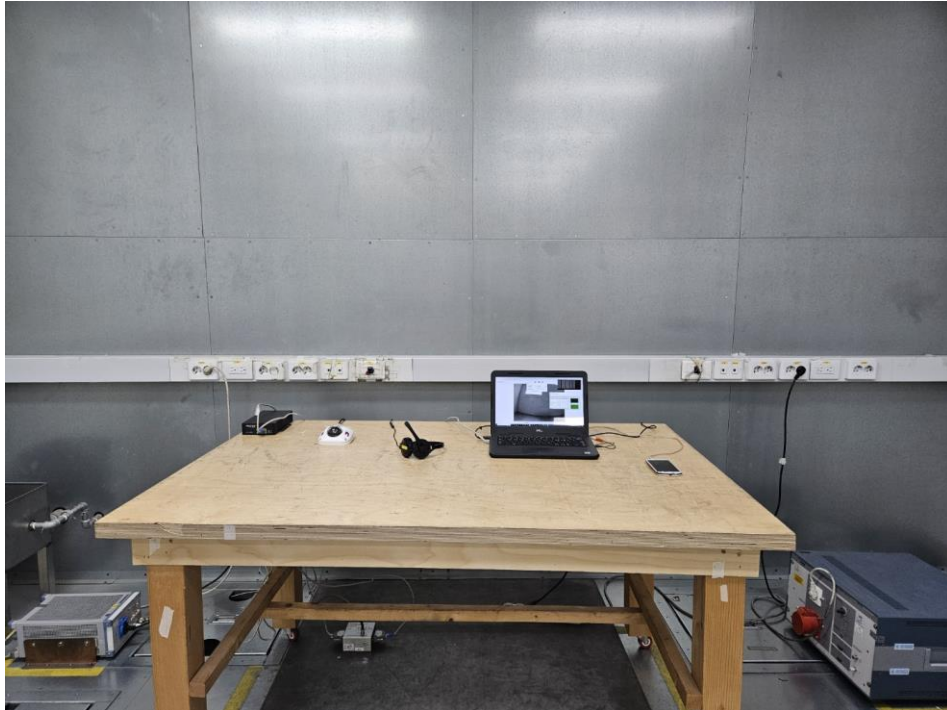
## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

N/A



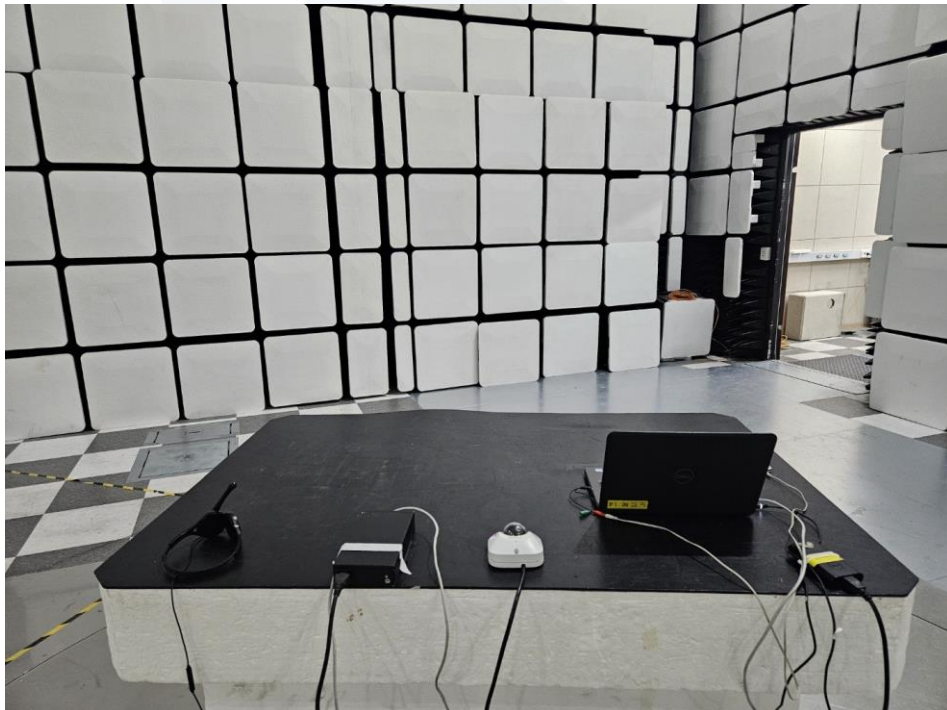
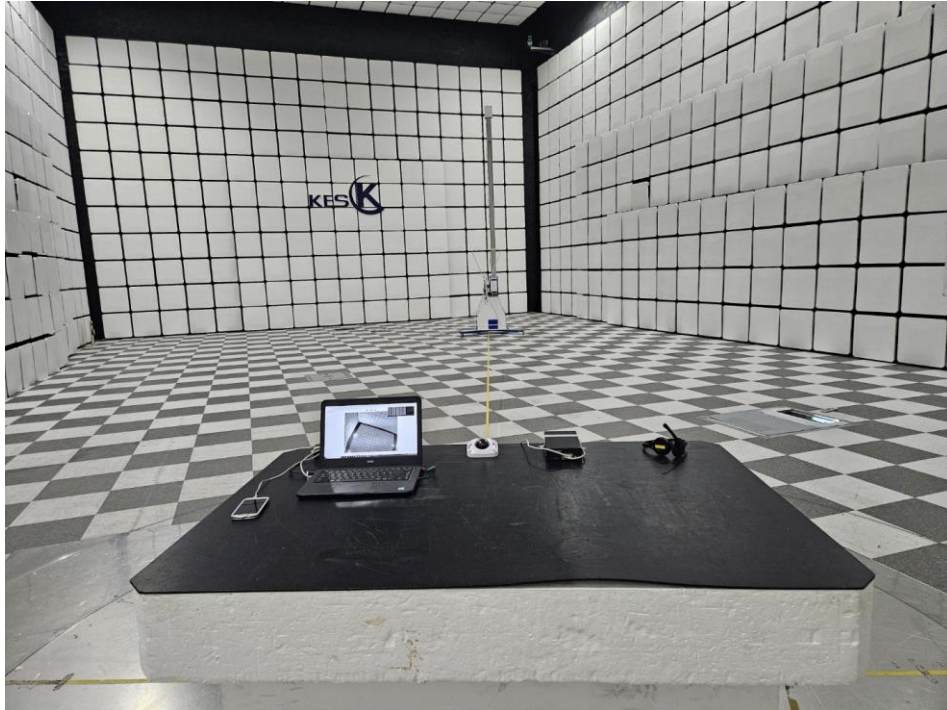
## Conducted Emissions at Telecommunication Ports





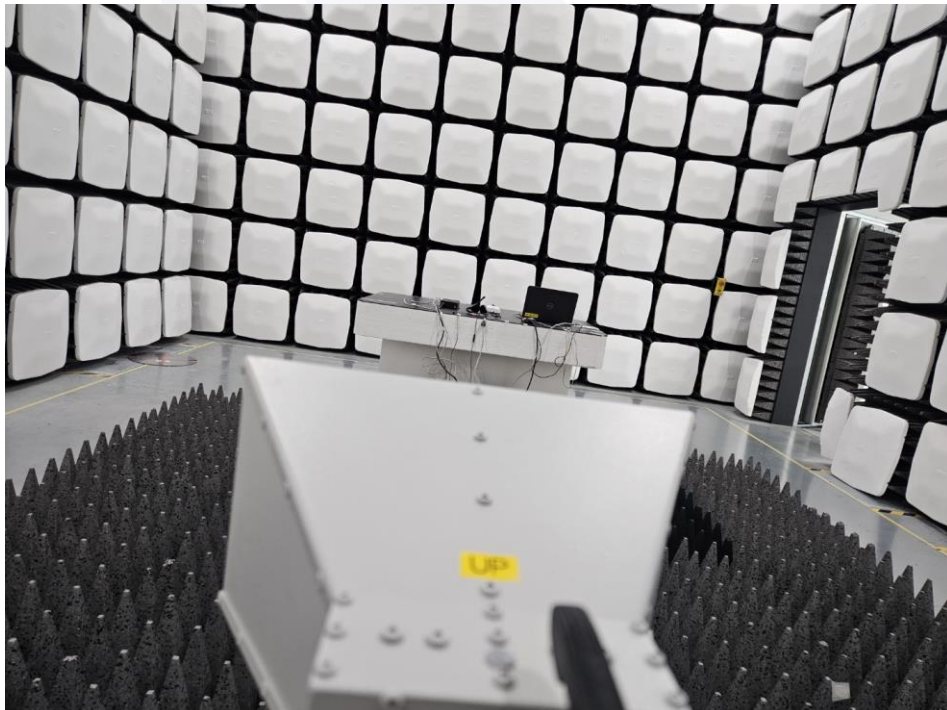
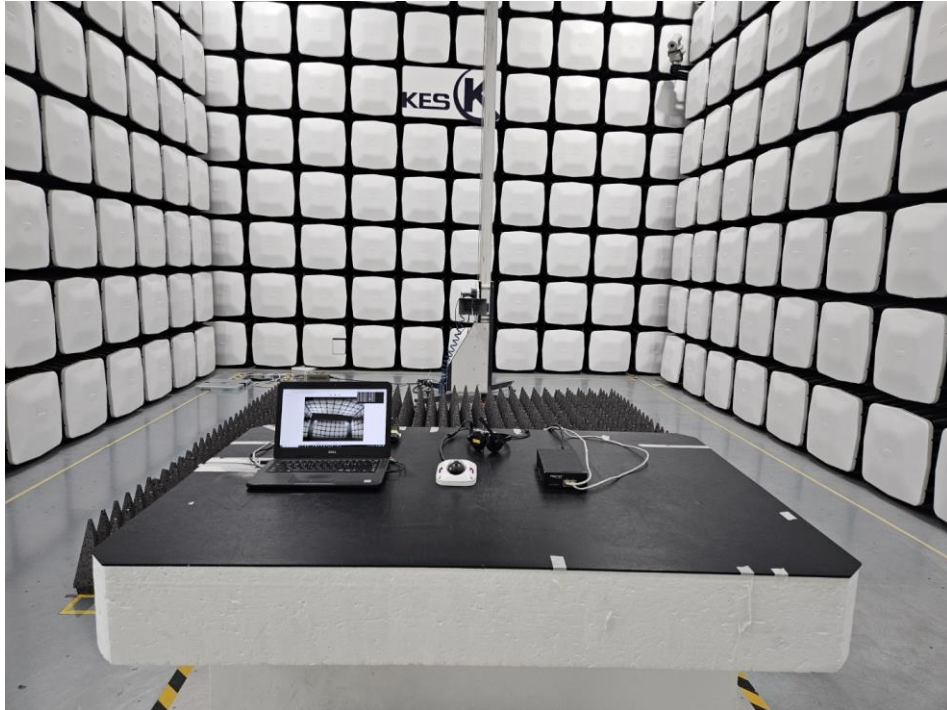


## Radiated Electric Field Emissions(Below 1 GHz)





## Radiated Electric Field Emissions(Above 1 GHz)





## EUT External Photographs

(Top)



(Bottom)



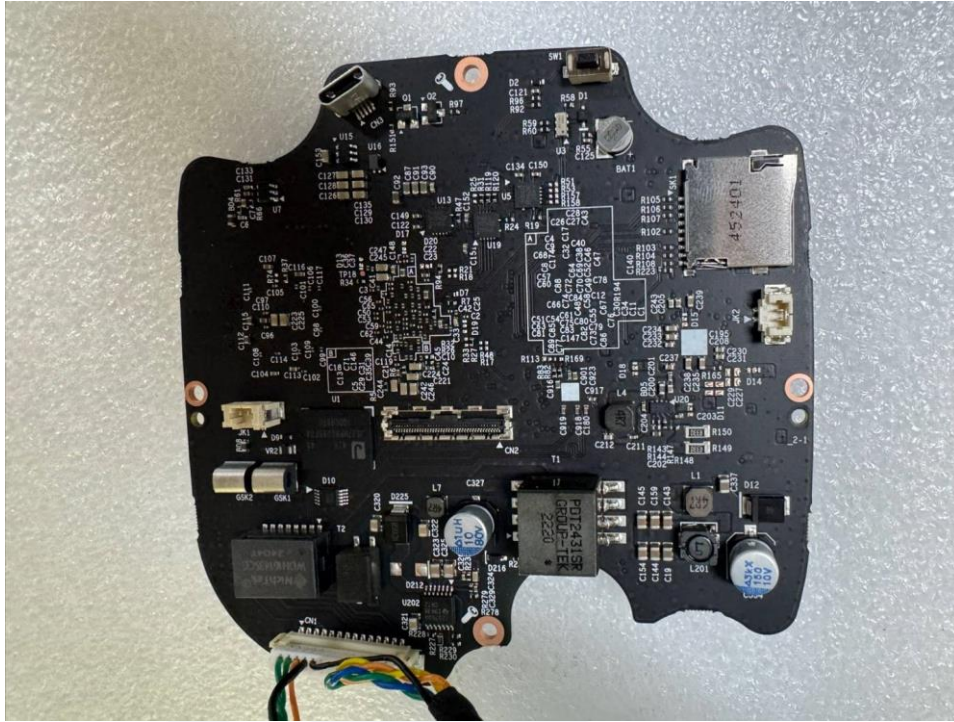


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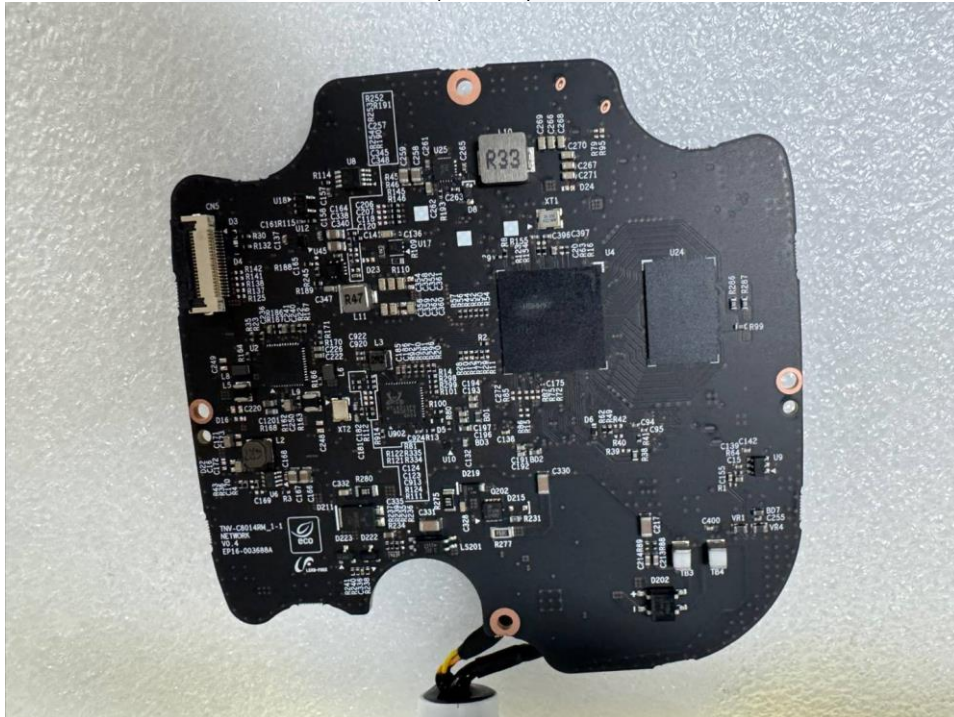


## EUT Internal View – Main Board

(Top)



(Bottom)

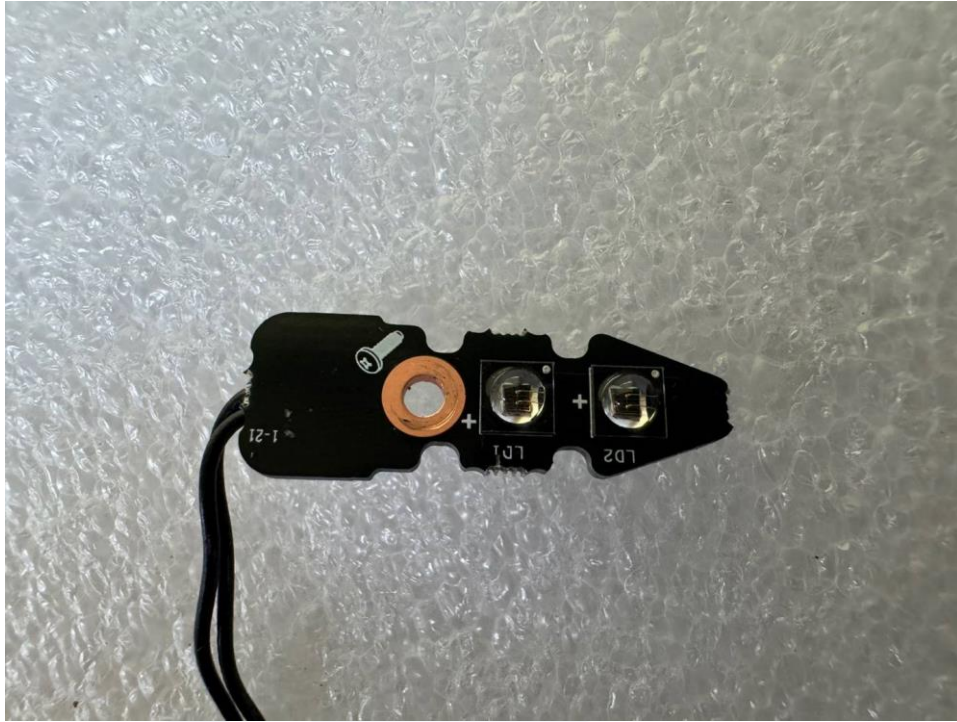




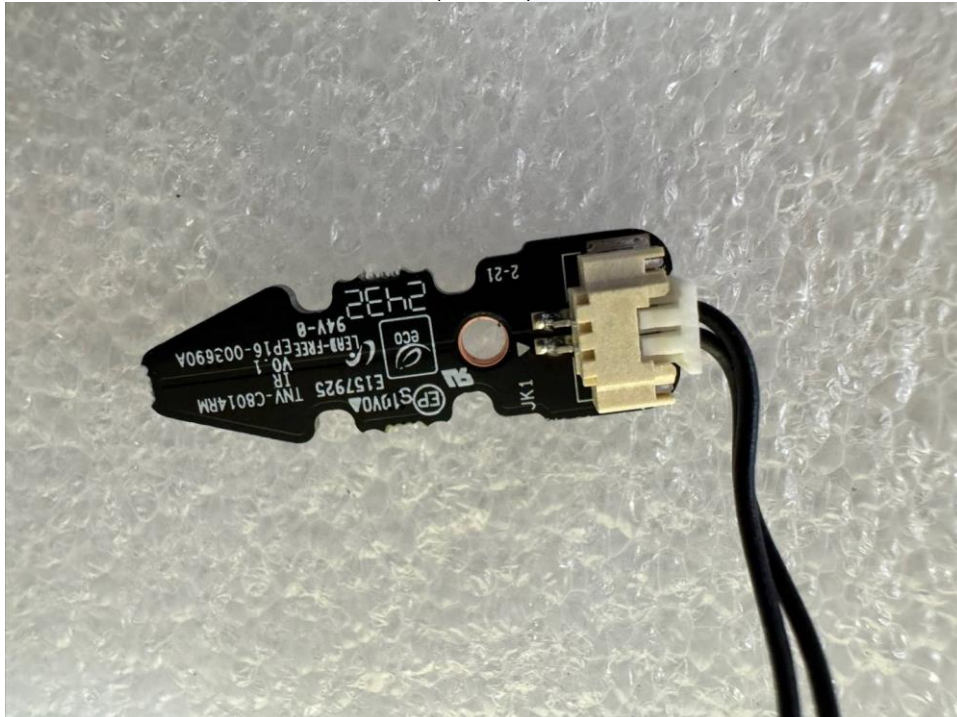


### EUT Internal View – SUB Board 1

(Top)



(Bottom)



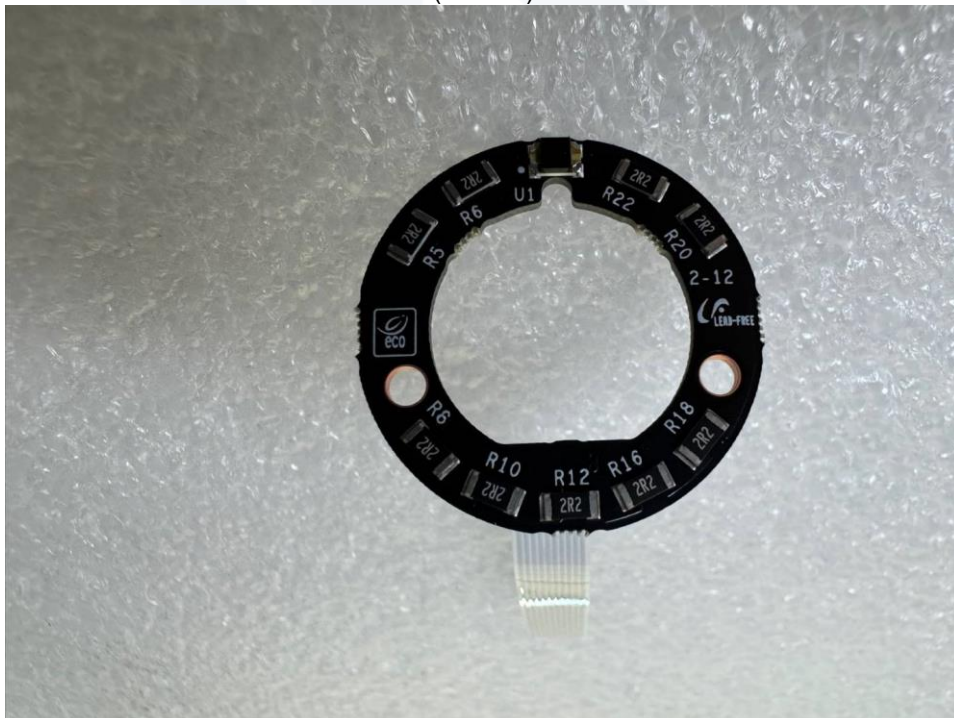


## EUT Internal View – SUB Board 2

(Top)



(Bottom)

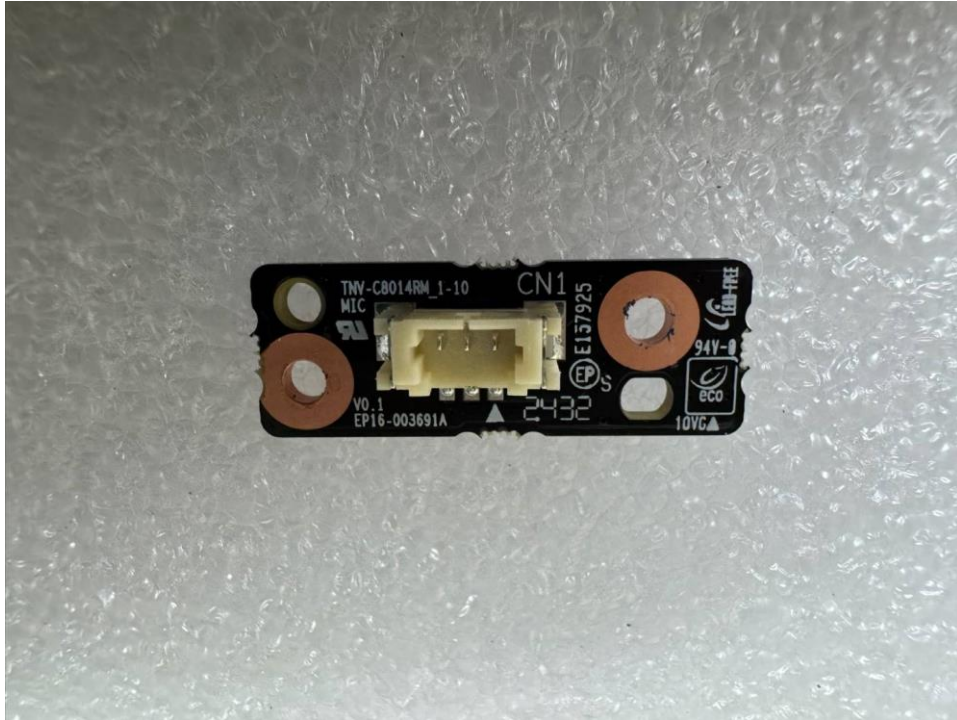




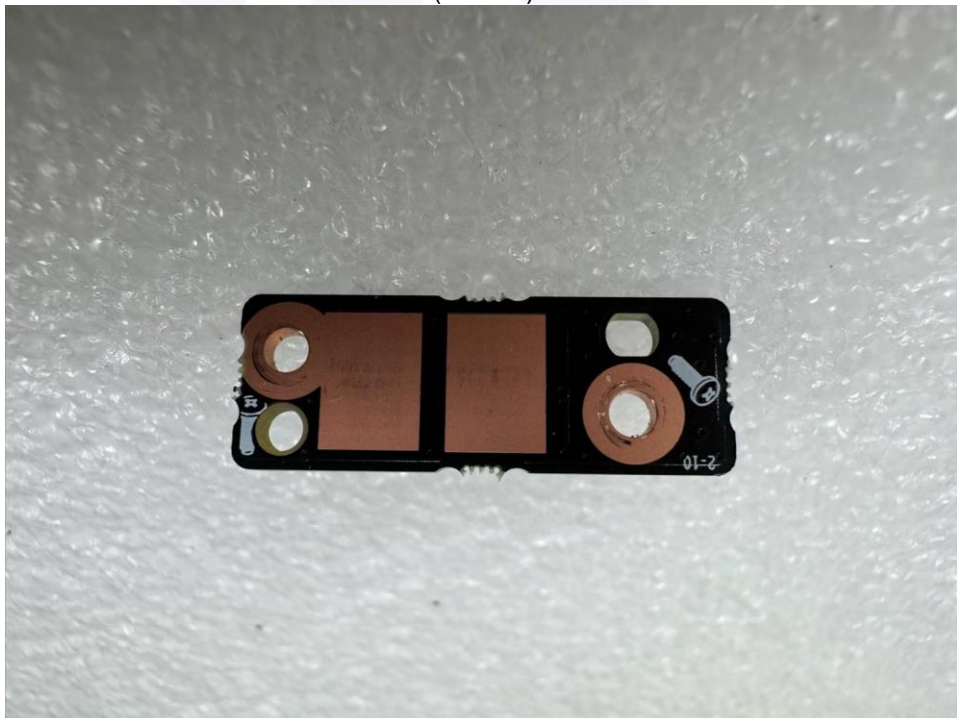


### EUT Internal View – SUB Board 3

(Top)



(Bottom)





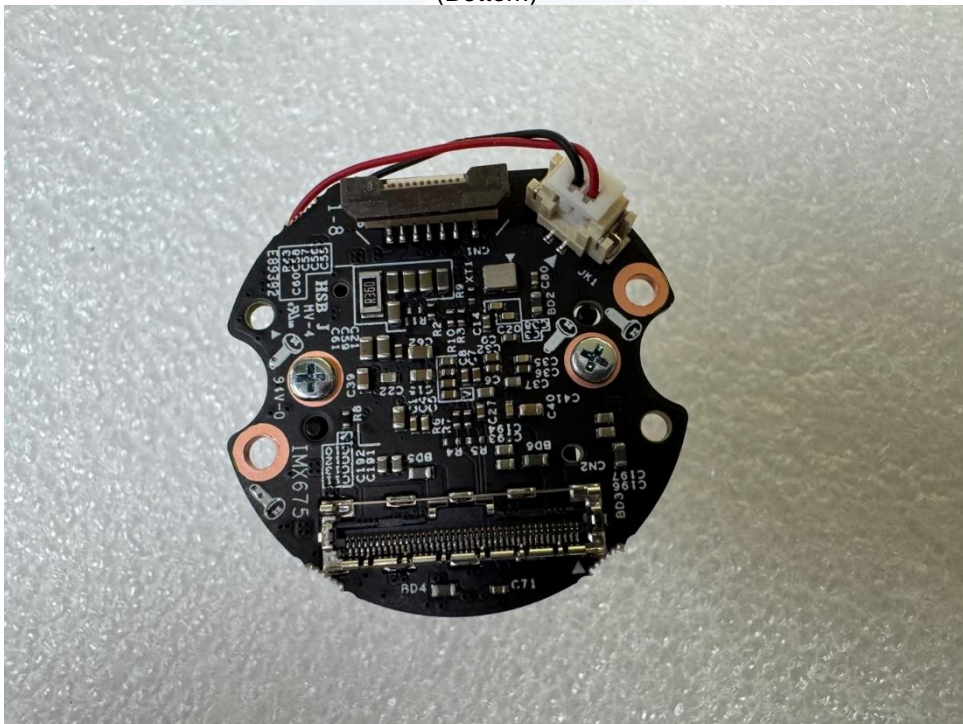


## EUT Internal View – Lens Board

(Top)



(Bottom)





### EUT Internal View – Microphone

(Top)



(Bottom)



The End.