

# TEST REPORT



Report No. : KES-EM-23T0913

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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. : XNP-C7310R

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 commune,  
Bac Ninh city, Bac Ninh province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea

3. Date of Receipt : Oct. 13, 2023

4. Test date : Oct. 16, 2023 ~ Oct. 17, 2023

5. Date of Issue : Oct. 26, 2023

6. Test Results : In Compliance

Tested by

Jun Soo, Jung  
EMC Test Engineer

Reviewed by

Hyo Jin, Kim  
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 |
|---------------|-----------------|------------------|
| Oct. 26, 2023 | KES-EM-23T0913  | Issued           |
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## 1.0 General Product Description

### Main Specifications of EUT are:

| Video                            |                                                                                                                                                                                                                                                     | Radiometry                       |                                                                                                                                                                                                                                                     |                                                                    |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Imaging Device                   | 1/1.8" CMOS                                                                                                                                                                                                                                         | Temperature Detect Range         | None                                                                                                                                                                                                                                                |                                                                    |
| Resolution                       | 2592x1520, 2560x1440, 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240                                                                                                             | Temperature Accuracy             | None                                                                                                                                                                                                                                                |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Temperature Detection            | None                                                                                                                                                                                                                                                |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Additional                       | None                                                                                                                                                                                                                                                |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Network                          |                                                                                                                                                                                                                                                     |                                                                    |
| Max. Framerate                   | H.265/H.264: Max. 60fps/50fps(60Hz/50Hz)(WDR off)<br>H.265/H.264: Max. 30fps/25fps(60Hz/50Hz)(WDR on)<br>MJPEG: Max. 30fps@4MP Max. 5fps)                                                                                                           | Ethernet                         | Metal shielded RJ-45(10/100BASE-T)                                                                                                                                                                                                                  |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Video Compression                | H.265/H.264: Main/Baseline/High, MJPEG                                                                                                                                                                                                              |                                                                    |
| NETD                             | None                                                                                                                                                                                                                                                | Audio Compression                | None                                                                                                                                                                                                                                                |                                                                    |
| Pixel Size                       | None                                                                                                                                                                                                                                                | Smart Codec                      | Manual(Sea area), WiseStream II, WiseStreamIII(Based on AI engine)                                                                                                                                                                                  |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Video Quality Adjustment         | H.264/H.265: Target bitrate level control<br>MJPEG: Target bitrate level control                                                                                                                                                                    |                                                                    |
| Min. Illumination                | Color: 0.04 Lux(F1.36, 1/30sec, 30 IRE)<br>BW: 0.004 Lux(F1.36, IR LED Off), 0Lux (IR LED On)                                                                                                                                                       | Bitrate Control                  | H.264/H.265: CBR or VBR<br>MJPEG: VBR                                                                                                                                                                                                               |                                                                    |
| Video Out                        | None                                                                                                                                                                                                                                                | Streaming                        | Unicast(20 users) / Multicast<br>Multiple streaming(Up to 10 profiles)                                                                                                                                                                              |                                                                    |
| Video Transmission Distance      | None                                                                                                                                                                                                                                                | Protocol                         | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast-2), NTCIP 1205, MQTT                 |                                                                    |
| Lens                             |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| Focal Length (Zoom Ratio)        | 6.91 ~ 214.7mm(31x) zoom (digital 32x, total 992x zoom)                                                                                                                                                                                             |                                  | SIP support (VoIP, Peer-to-peer)                                                                                                                                                                                                                    | None                                                               |
| Max. Aperture Ratio              | F1.36(Wide)~F4.6(Tele)                                                                                                                                                                                                                              |                                  | Security                                                                                                                                                                                                                                            | None                                                               |
| Angular Field of View            | H : 59.4°(Wide)~2.54°(Tele)<br>V : 35.8°(Wide)~1.49°(Tele)<br>D : 68.2°(Wide)~2.95°(Tele)                                                                                                                                                           |                                  | Application Programming Inter                                                                                                                                                                                                                       | ONVIF Profile S/G/T/M<br>SUNAPI(HTTP API)<br>Wisenet open platform |
| Security                         |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| OS / Firmware Protect            | Secure boot, Signed firmware, Firmware encryption                                                                                                                                                                                                   | OS / Firmware Protect            | Secure boot, Signed firmware, Firmware encryption                                                                                                                                                                                                   |                                                                    |
| User authentication              | Digest Authentication, Prevent brute-force attack                                                                                                                                                                                                   | User authentication              | Digest Authentication, Prevent brute-force attack                                                                                                                                                                                                   |                                                                    |
| Network authentication           | 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)                                                                                                                                                                                         | Network authentication           | 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)                                                                                                                                                                                         |                                                                    |
| Secure Communication             | HTTPS, SRTP, WSS(Websocket secure)                                                                                                                                                                                                                  | Secure Communication             | HTTPS, SRTP, WSS(Websocket secure)                                                                                                                                                                                                                  |                                                                    |
| Access Control                   | Access control based on IP address                                                                                                                                                                                                                  | Access Control                   | Access control based on IP address                                                                                                                                                                                                                  |                                                                    |
| Data Protect                     | Authentication information encryption, ZIP compression encryption                                                                                                                                                                                   | Data Protect                     | Authentication information encryption, ZIP compression encryption                                                                                                                                                                                   |                                                                    |
| Audit                            | User Access/System/Event log management                                                                                                                                                                                                             | Audit                            | User Access/System/Event log management                                                                                                                                                                                                             |                                                                    |
| Device ID                        | Device Certificate(Hanwha Private Root CA)                                                                                                                                                                                                          | Device ID                        | TPM(Trusted platform module), HTPM(Hanwha trusted platform module), SDcard partition encrypt                                                                                                                                                        |                                                                    |
| Secure Storage                   | TPM with FIPS 140-2 level 2                                                                                                                                                                                                                         | Secure Storage                   | SDcard partition encrypt                                                                                                                                                                                                                            |                                                                    |
| Security Certificate             | TPM with FIPS 140-2 level 2                                                                                                                                                                                                                         | Security Certificate             | TPM with FIPS 140-2 level 2                                                                                                                                                                                                                         |                                                                    |
| General                          |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| Webpage Language                 | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek                                                                                                          | Webpage Language                 | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek                                                                                                          |                                                                    |
| Web Viewer                       | None                                                                                                                                                                                                                                                | Web Viewer                       | None                                                                                                                                                                                                                                                |                                                                    |
| Edge Storage                     | Micro SD/SDHC/SDXC 2slot 1TB (512MBx2)                                                                                                                                                                                                              | Edge Storage                     | Micro SD/SDHC/SDXC 2slot 1TB (512MBx2)                                                                                                                                                                                                              |                                                                    |
| Memory                           | 4GB RAM, 512MB Flash                                                                                                                                                                                                                                | Memory                           | 4GB RAM, 512MB Flash                                                                                                                                                                                                                                |                                                                    |
| Environmental & Electrical       |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| Operating Temperature / Humidity | Normal : -50°C ~ +55°C(5B°F ~ +131°F)<br>+74°C(165°F)(Max) based on NEMA TS-2(2.2.7)<br>* Start up should be done at above -30°C<br>Less than 95%RH(Non-condensing)                                                                                 | Operating Temperature / Humidity | Normal : -50°C ~ +55°C(5B°F ~ +131°F)<br>+74°C(165°F)(Max) based on NEMA TS-2(2.2.7)<br>* Start up should be done at above -30°C<br>Less than 95%RH(Non-condensing)                                                                                 |                                                                    |
|                                  |                                                                                                                                                                                                                                                     | Storage Temperature / Humidity   | -50°C ~ +60°C(-5B°F ~ +140°F) / 0 ~ 90% RH                                                                                                                                                                                                          |                                                                    |
| Certification                    | IP66/IP67, IK10, NEMA4X<br>Safety(UL, KC, SD-DOCK), EMC(FCC, CE, VCCI, RCM, KC)<br>NEMA-TS 2(2.2.7, 2.2.8, 2.2.9)<br>HPoE(IEEE802.3bt type4, Class8, injector included)<br>HPoE: Max 62W, typical 23W                                               | Certification                    | IP66/IP67, IK10, NEMA4X<br>Safety(UL, KC, SD-DOCK), EMC(FCC, CE, VCCI, RCM, KC)<br>NEMA-TS 2(2.2.7, 2.2.8, 2.2.9)<br>HPoE(IEEE802.3bt type4, Class8, injector included)<br>HPoE: Max 62W, typical 23W                                               |                                                                    |
| Input Voltage                    | HPoE: Max 62W, typical 23W                                                                                                                                                                                                                          | Input Voltage                    | HPoE: Max 62W, typical 23W                                                                                                                                                                                                                          |                                                                    |
| Power Consumption                | HPoE: Max 62W, typical 23W                                                                                                                                                                                                                          | Power Consumption                | HPoE: Max 62W, typical 23W                                                                                                                                                                                                                          |                                                                    |
| Mechanical                       |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| Color / Material                 | White / Aluminum                                                                                                                                                                                                                                    | Color / Material                 | White / Aluminum                                                                                                                                                                                                                                    |                                                                    |
| RAL Code                         | RAL9003                                                                                                                                                                                                                                             | RAL Code                         | RAL9003                                                                                                                                                                                                                                             |                                                                    |
| Product Dimensions / Weight      | #188x264.9mm(#7.40x10.47") / 4400g (9.70lb)                                                                                                                                                                                                         | Product Dimensions / Weight      | #188x264.9mm(#7.40x10.47") / 4400g (9.70lb)                                                                                                                                                                                                         |                                                                    |
| Compatible Conduit hole / Gasket | None                                                                                                                                                                                                                                                | Compatible Conduit hole / Gasket | None                                                                                                                                                                                                                                                |                                                                    |
| Hanging Mount (Dome)             | SBP-156HMW                                                                                                                                                                                                                                          | Hanging Mount (Dome)             | SBP-156HMW                                                                                                                                                                                                                                          |                                                                    |
| Skin Cover                       | None                                                                                                                                                                                                                                                | Skin Cover                       | None                                                                                                                                                                                                                                                |                                                                    |
| Skin Cover (Dome)                | None                                                                                                                                                                                                                                                | Skin Cover (Dome)                | None                                                                                                                                                                                                                                                |                                                                    |
| Weather Cap (Dome)               | None                                                                                                                                                                                                                                                | Weather Cap (Dome)               | None                                                                                                                                                                                                                                                |                                                                    |
| Power Module                     | None                                                                                                                                                                                                                                                | Power Module                     | None                                                                                                                                                                                                                                                |                                                                    |
| Backbox                          | None                                                                                                                                                                                                                                                | Backbox                          | None                                                                                                                                                                                                                                                |                                                                    |
| Ceiling Mount (Assy)             | SBP-156CMW, SBP-300CMTS, SBP-300CMW1/900CMW, SBP-150CMI/300CMI                                                                                                                                                                                      | Ceiling Mount (Assy)             | SBP-156CMW, SBP-300CMTS, SBP-300CMW1/900CMW, SBP-150CMI/300CMI                                                                                                                                                                                      |                                                                    |
| Wall Mount                       | SBP-156WMW, SBP-300WMW2                                                                                                                                                                                                                             | Wall Mount                       | SBP-156WMW, SBP-300WMW2                                                                                                                                                                                                                             |                                                                    |
| Pole Mount                       | SBP-300PMW2                                                                                                                                                                                                                                         | Pole Mount                       | SBP-300PMW2                                                                                                                                                                                                                                         |                                                                    |
| In-ceiling Mount                 | None                                                                                                                                                                                                                                                | In-ceiling Mount                 | None                                                                                                                                                                                                                                                |                                                                    |
| Parapet Mount                    | SBP-156LMW, SBP-300LMW                                                                                                                                                                                                                              | Parapet Mount                    | SBP-156LMW, SBP-300LMW                                                                                                                                                                                                                              |                                                                    |
| Corner Mount                     | SBP-156KMW, SBP-300KMW1                                                                                                                                                                                                                             | Corner Mount                     | SBP-156KMW, SBP-300KMW1                                                                                                                                                                                                                             |                                                                    |
| Tilt Mount                       | None                                                                                                                                                                                                                                                | Tilt Mount                       | None                                                                                                                                                                                                                                                |                                                                    |
| Housing (Box)                    | None                                                                                                                                                                                                                                                | Housing (Box)                    | None                                                                                                                                                                                                                                                |                                                                    |
| Cabinet                          | SBP-300NBW                                                                                                                                                                                                                                          | Cabinet                          | SBP-300NBW                                                                                                                                                                                                                                          |                                                                    |
| Gang Plate                       | None                                                                                                                                                                                                                                                | Gang Plate                       | None                                                                                                                                                                                                                                                |                                                                    |
| Conduit Adaptor                  | None                                                                                                                                                                                                                                                | Conduit Adaptor                  | None                                                                                                                                                                                                                                                |                                                                    |
| Other Compatible Models          | None                                                                                                                                                                                                                                                | Other Compatible Models          | None                                                                                                                                                                                                                                                |                                                                    |
| Certifications & Standards       |                                                                                                                                                                                                                                                     |                                  |                                                                                                                                                                                                                                                     |                                                                    |
| Network                          | None                                                                                                                                                                                                                                                | 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 CISRR 32 Class A<br>RCM AS/NZS CISPR 32 Class A<br>KS C 9832 Class A, KS C 9835                                | 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 CISRR 32 Class A<br>RCM AS/NZS CISPR 32 Class A<br>KS C 9832 Class A, KS C 9835                                |                                                                    |
|                                  | Safety                                                                                                                                                                                                                                              |                                  | IEC/EN 62971<br>IEC/EN 62471                                                                                                                                                                                                                        |                                                                    |
|                                  | Environment                                                                                                                                                                                                                                         |                                  | IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK10<br>NEMA TS 2-2013 (2.2.7, 2.2.8, 2.2.9)<br>NEMA 250 type 4X                                                                                                                                               |                                                                    |
|                                  | Video                                                                                                                                                                                                                                               |                                  | None                                                                                                                                                                                                                                                |                                                                    |
| DORI (EN62676-4 standard)        | Detect (25PPM/ 8PPF)<br>Observe (63PPM/ 19PPF)<br>Recognize (125PPM/ 38PPF)<br>Identify (250PPM/ 76PPF)                                                                                                                                             | DORI (EN62676-4 standard)        | Detect (25PPM/ 8PPF)<br>Observe (63PPM/ 19PPF)<br>Recognize (125PPM/ 38PPF)<br>Identify (250PPM/ 76PPF)                                                                                                                                             |                                                                    |
| LPR/ANPR/MMCR                    | Speed Description<br>Speed limit<br>Min. Forward Distance<br>Max. Forward Distance<br>Max. Horizontal Angle<br>Max. Vertical Angle<br>Horizontal Offset<br>Camera Height<br>Lane Coverage<br>Vehicle Recognition<br>Available Countries             | LPR/ANPR/MMCR                    | Speed Description<br>Speed limit<br>Min. Forward Distance<br>Max. Forward Distance<br>Max. Horizontal Angle<br>Max. Vertical Angle<br>Horizontal Offset<br>Camera Height<br>Lane Coverage<br>Vehicle Recognition<br>Available Countries             |                                                                    |
| Wisenet Road AI LPR/ANPR/MMCR    | Solution<br>Speed Description<br>Lane Coverage<br>Speed limit<br>Min. Forward Distance<br>Max. Forward Distance<br>Max. Horizontal Angle<br>Max. Vertical Angle<br>Horizontal Offset<br>Camera Height<br>Vehicle Recognition<br>Available Countries | Wisenet Road AI LPR/ANPR/MMCR    | Solution<br>Speed Description<br>Lane Coverage<br>Speed limit<br>Min. Forward Distance<br>Max. Forward Distance<br>Max. Horizontal Angle<br>Max. Vertical Angle<br>Horizontal Offset<br>Camera Height<br>Vehicle Recognition<br>Available Countries |                                                                    |
| Ver                              | 2311                                                                                                                                                                                                                                                | Ver                              | 2311                                                                                                                                                                                                                                                |                                                                    |

## 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 100 V, 60 Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                          | Remarks |
|----------------|--------------|---------------|---------------------------------------|---------|
| NETWORK CAMERA | XNP-C7310R   | -             | HANWHA VISION VIETNAM COMPANY LIMITED | EUT     |

## 1.5 Support Equipments

| Description        | Model Number       | Serial Number | Manufacturer                               | Remarks |
|--------------------|--------------------|---------------|--------------------------------------------|---------|
| Fiber PoE Injector | PT-PSE109GBRO-AH-S | PT2332221966  | Dongguan PROCET Network Technology Co.,Ltd | -       |
| Fiber PoE Injector | PT-PSE109GBRO-AH-S | PT2023220052  | Dongguan PROCET Network Technology Co.,Ltd | -       |
| Notebook 1         | P95G001            | 8KM8HT2       | DELL INC.                                  | -       |
| Notebook 1 Adapter | LA90PM130          | -             | ITE-ON TECHNOLOGY CHANGZHOU CO.,LTD        | -       |
| Notebook 2         | Latitude 5300      | 8C47BE45C060  | DELL INC.                                  | -       |
| Notebook 2 Adapter | LA90PM130          | -             | LITE-ON TECHNOLOGY CHANGZHOU CO.,LTD       | -       |
| Optical module 1   | AFBR-57G5MZ-ELX    | AD2008G0210   | AVAGO                                      | -       |
| Optical module 2   | NEXT-SFP10G-SR     | -             | NEXT                                       | -       |
| Micro SD Card 1    | -                  | -             | SanDisk                                    | 16 GB   |
| Micro SD Card 2    | -                  | -             | 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)     | RJ-45         | Fiber PoE Injector (EUT) | RJ-45 (PoE)   | 2.0         | U      |
|                          | Micro SD Slot | Micro SD Card 1          | Micro SD Slot | -           | -      |
|                          | Micro SD Slot | Micro SD Card 2          | Micro SD Slot | -           | -      |
| Notebook 1 Adapter       | Line          | Notebook 1               | DC Jack       | 1.5         | U      |
| Fiber PoE Injector (EUT) | RJ-45 (LAN)   |                          | RJ-45         | 4.0         | U      |
|                          | Ground        | Enclosure ground         | Ground        | 2.0         | U      |
|                          | SFP           | Optical module 1         | SFP           | -           | -      |
| Optical module 2         | Optical       |                          | Optical       | 5.0         | U      |
|                          | SFP           | Fiber PoE Injector       | SFP           | -           | -      |
| Notebook 2               | RJ-45         |                          | RJ-45 (LAN)   | 2.0         | U      |
|                          | DC Jack       | Notebook 2 Adapter       | Line          | 1.5         | U      |

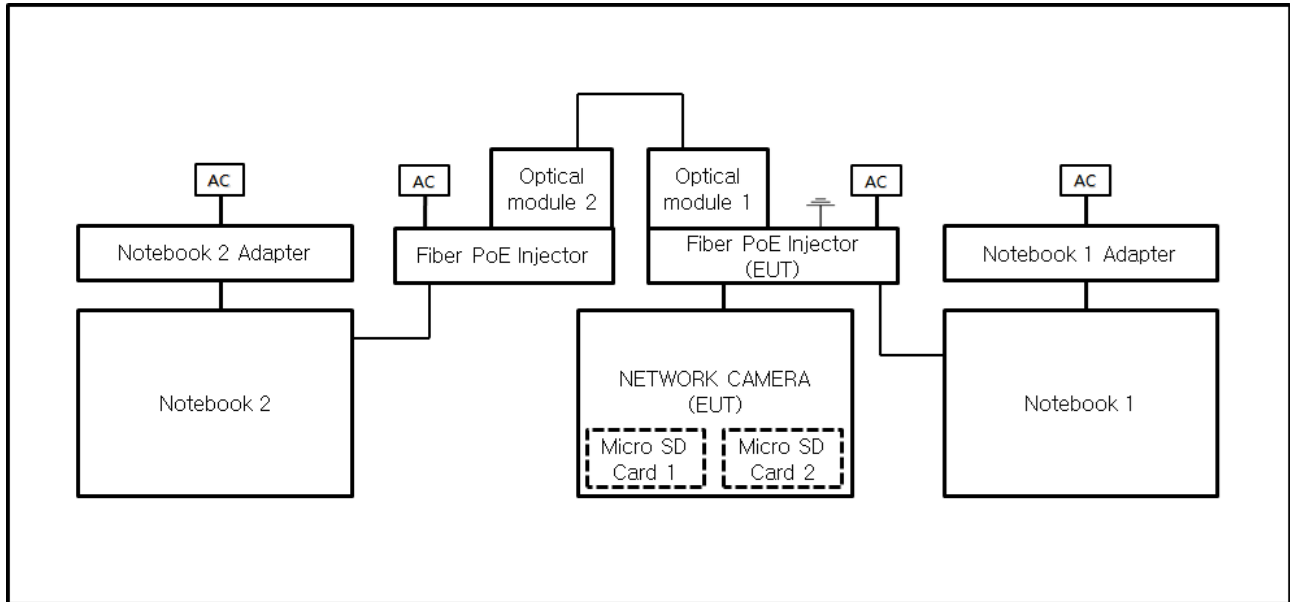
\* Unshielded=U, Shielded=S

## 1.7 EUT Operating Mode(s)

| Test mode | Normal operating                                                                                                                                                                                      | Test Voltages   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Operating | 1. Check if the EUT image is output to the Notebook normally.<br>2. Check if the network is operating normally through a ping test.<br>3. After testing, I checked the files stored on Micro SD card. | AC 100 V, 60 Hz |

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

## 1.8 Configuration



**1.9 Remarks when standards applied**

N/A

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

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

**1.11 Test Facility**

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

**1.12 Laboratory Accreditations and Listings**

| Country       | Agency  | Scope of Accreditation                                                                                                                  | Logo                                                                                                                           |
|---------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| KOREA         | RRA     | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KR0100                                  |
| International | KOLAS   | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KT489                                  |
| USA           | FCC     | 3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.                                            | <br>KR0100                                |
| Canada        | ISED    | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                | <br>23298                                 |
| JAPAN         | VCCI    | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)                                                                          | <br>C-20136, T-20137,<br>R-20181, G-20176 |
| Europe        | TÜV SÜD | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>CARAT 001633 0004                     |

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ VCCI-CISPR 32:2016

☒ Class A

☐ Class B

## 2.1 Conducted Emissions Mains Power Ports

**Test Date**

Oct. 17, 2023

**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, 11, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 10, 2023 |

**Test Conditions**

Temperature: (23,1 ± 0,1) °C

Relative Humidity: (46,5 ± 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

Oct. 17, 2023

### 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, 11, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 10, 2023 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 11, 22, 2023 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 11, 22, 2023 |

### Test Conditions

Temperature: (23,1 ± 0,1) °C

Relative Humidity: (46,5 ± 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.

- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

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

### Test Date

Oct. 16, 2023

### 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        | 03, 21, 2024 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 17, 2024 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 03, 2024 |

### Test Conditions

Temperature: (23,4 ± 0,1) °C

Relative Humidity: (46,8 ± 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. 16, 2023

**Test Location**

SEMI ANECHOIC CHAMBER #3

**Test Equipment**

| Used                                | Description                | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|----------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W               | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER          | ESR7         | R & S            | 101190        | 07, 31, 2024 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 03, 06, 2024 |
| <input checked="" type="checkbox"/> | ATTENUATOR                 | 8491A        | HP               | 35496         | 03, 03, 2024 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 03, 06, 2024 |

**Test Conditions**

Temperature: (23,2 ± 0,1) °C

Relative Humidity: (45,0 ± 0,1) % R.H.

**Frequency Range of Measurement**

1 GHz to 6 GHz

**Instrument Settings**

IF Band Width: 1 MHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

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

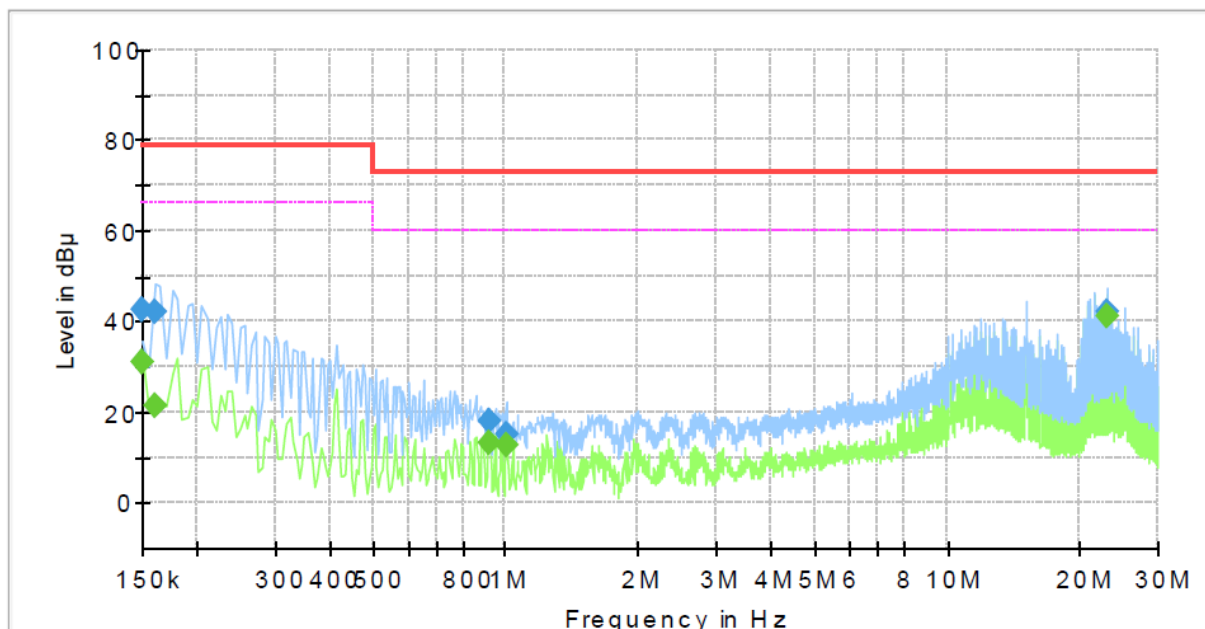
## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

HOT LINE

#### Common Information

Test Description: Conducted Emission  
 Model No.: XNP-C7310R  
 Phase: L1  
 Mode:  
 Operator Name: KES



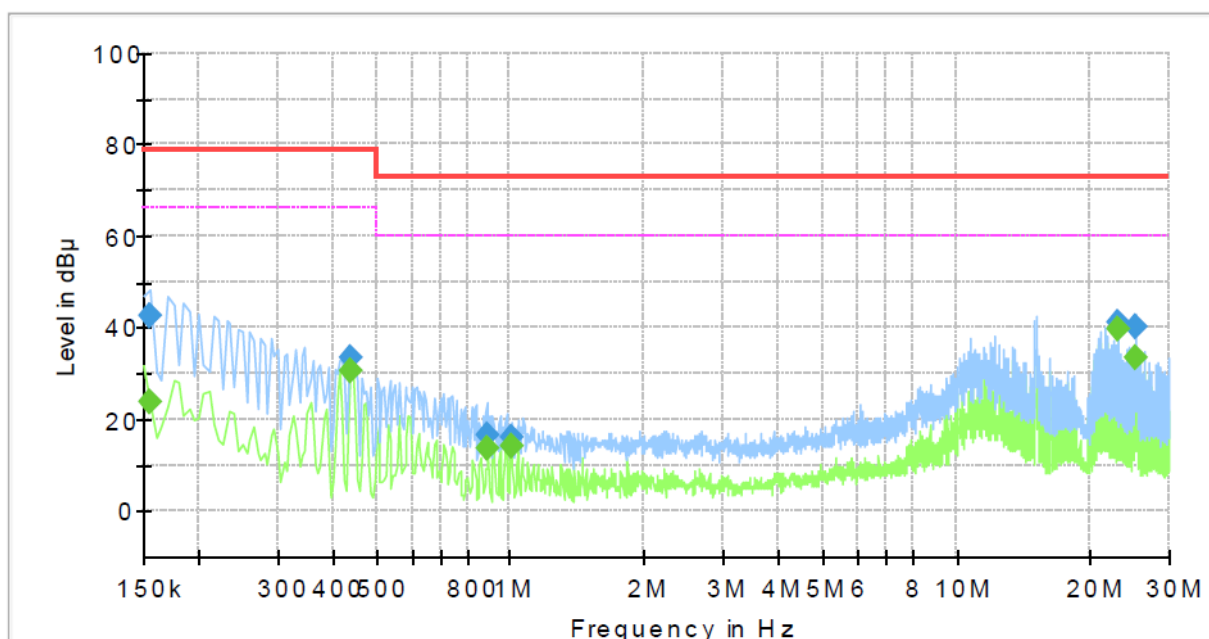
#### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.150000        | ---              | 31.14           | 66.00        | 34.86       | 1000.0          | 9.000           | L1   | 19.4       |
| 0.150000        | 42.76            | ---             | 79.00        | 36.24       | 1000.0          | 9.000           | L1   | 19.4       |
| 0.160000        | ---              | 21.58           | 66.00        | 44.42       | 1000.0          | 9.000           | L1   | 19.4       |
| 0.160000        | 42.01            | ---             | 79.00        | 36.99       | 1000.0          | 9.000           | L1   | 19.4       |
| 0.920000        | ---              | 13.23           | 60.00        | 46.77       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.920000        | 17.89            | ---             | 73.00        | 55.11       | 1000.0          | 9.000           | L1   | 19.5       |
| 1.005000        | ---              | 12.78           | 60.00        | 47.22       | 1000.0          | 9.000           | L1   | 19.5       |
| 1.005000        | 14.97            | ---             | 73.00        | 58.03       | 1000.0          | 9.000           | L1   | 19.5       |
| 23.130000       | ---              | 41.00           | 60.00        | 19.00       | 1000.0          | 9.000           | L1   | 20.3       |
| 23.130000       | 42.11            | ---             | 73.00        | 30.89       | 1000.0          | 9.000           | L1   | 20.3       |

## NEUTRAL LINE

**Common Information**

Test Description: Conducted Emission  
 Model No.: XNP-C7310R  
 Phase: N  
 Mode:  
 Operator Name: KES

**Final Result**

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.155000        | ---              | 23.98           | 66.00        | 42.02       | 1000.0          | 9.000           | N    | 19.4       |
| 0.155000        | 42.64            | ---             | 79.00        | 36.36       | 1000.0          | 9.000           | N    | 19.4       |
| 0.440000        | ---              | 30.70           | 66.00        | 35.30       | 1000.0          | 9.000           | N    | 19.4       |
| 0.440000        | 33.61            | ---             | 79.00        | 45.39       | 1000.0          | 9.000           | N    | 19.4       |
| 0.885000        | ---              | 13.54           | 60.00        | 46.46       | 1000.0          | 9.000           | N    | 19.5       |
| 0.885000        | 16.44            | ---             | 73.00        | 56.56       | 1000.0          | 9.000           | N    | 19.5       |
| 1.005000        | ---              | 14.09           | 60.00        | 45.91       | 1000.0          | 9.000           | N    | 19.5       |
| 1.005000        | 15.98            | ---             | 73.00        | 57.02       | 1000.0          | 9.000           | N    | 19.5       |
| 23.130000       | ---              | 39.90           | 60.00        | 20.10       | 1000.0          | 9.000           | N    | 20.3       |
| 23.130000       | 41.12            | ---             | 73.00        | 31.88       | 1000.0          | 9.000           | N    | 20.3       |
| 25.205000       | ---              | 33.53           | 60.00        | 26.47       | 1000.0          | 9.000           | N    | 20.3       |
| 25.205000       | 40.22            | ---             | 73.00        | 32.78       | 1000.0          | 9.000           | N    | 20.3       |

## ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

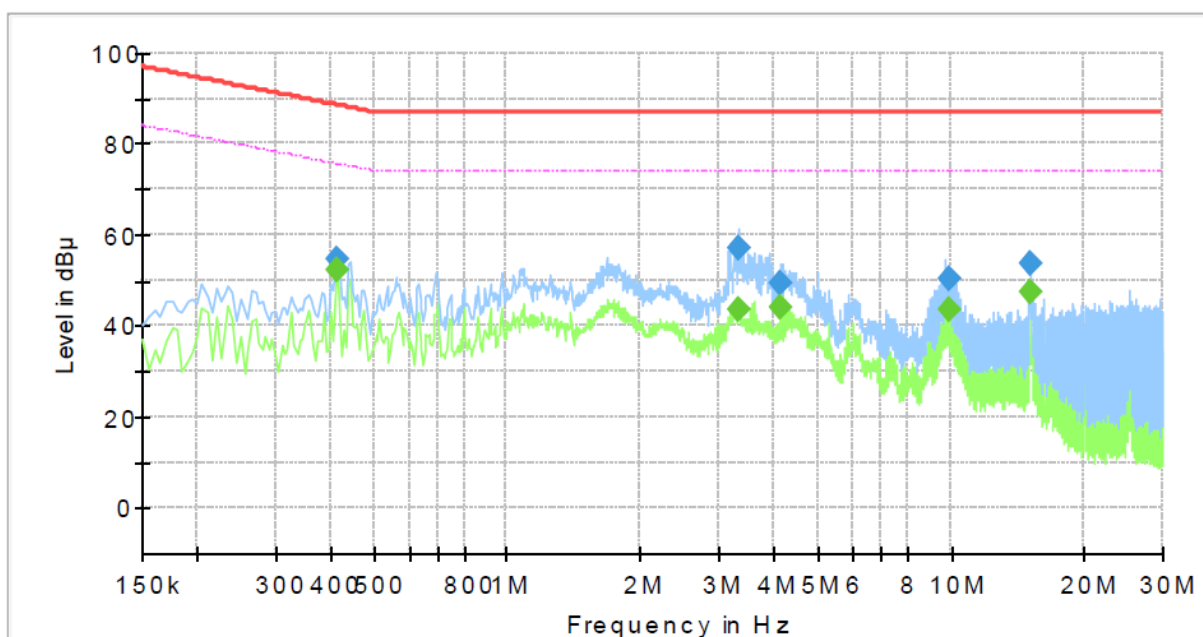
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

## Conducted Emissions at Telecommunication Ports

[1 000 Mbps]

### Common Information

Test Description: Telecommunication Emission  
 Model No.: XNP-C7310R  
 Mode :  
 Speed : 1 000 Mbps  
 Operator Name: KES



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.415000        | ---              | 52.26           | 75.55        | 23.29       | 1000.0          | 9.000           | Single Line | 19.4       |
| 0.415000        | 54.41            | ---             | 88.55        | 34.14       | 1000.0          | 9.000           | Single Line | 19.4       |
| 3.315000        | ---              | 43.65           | 74.00        | 30.35       | 1000.0          | 9.000           | Single Line | 19.4       |
| 3.315000        | 57.05            | ---             | 87.00        | 29.95       | 1000.0          | 9.000           | Single Line | 19.4       |
| 4.125000        | ---              | 43.93           | 74.00        | 30.07       | 1000.0          | 9.000           | Single Line | 19.4       |
| 4.125000        | 49.48            | ---             | 87.00        | 37.52       | 1000.0          | 9.000           | Single Line | 19.4       |
| 9.990000        | ---              | 43.38           | 74.00        | 30.62       | 1000.0          | 9.000           | Single Line | 19.6       |
| 9.990000        | 50.34            | ---             | 87.00        | 36.66       | 1000.0          | 9.000           | Single Line | 19.6       |
| 15.160000       | ---              | 47.20           | 74.00        | 26.80       | 1000.0          | 9.000           | Single Line | 19.8       |
| 15.160000       | 53.68            | ---             | 87.00        | 33.32       | 1000.0          | 9.000           | Single Line | 19.8       |

#### ♦ Calculation

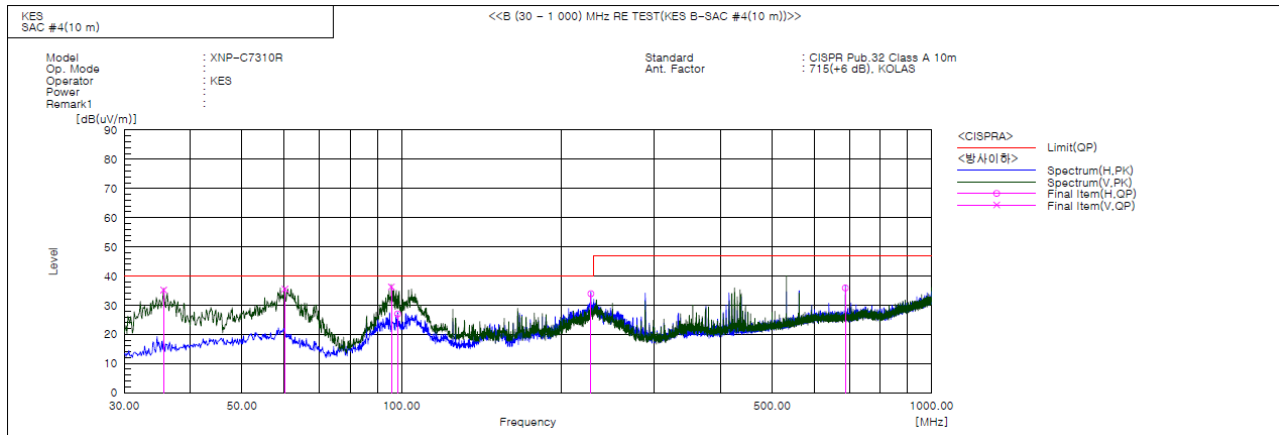
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

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

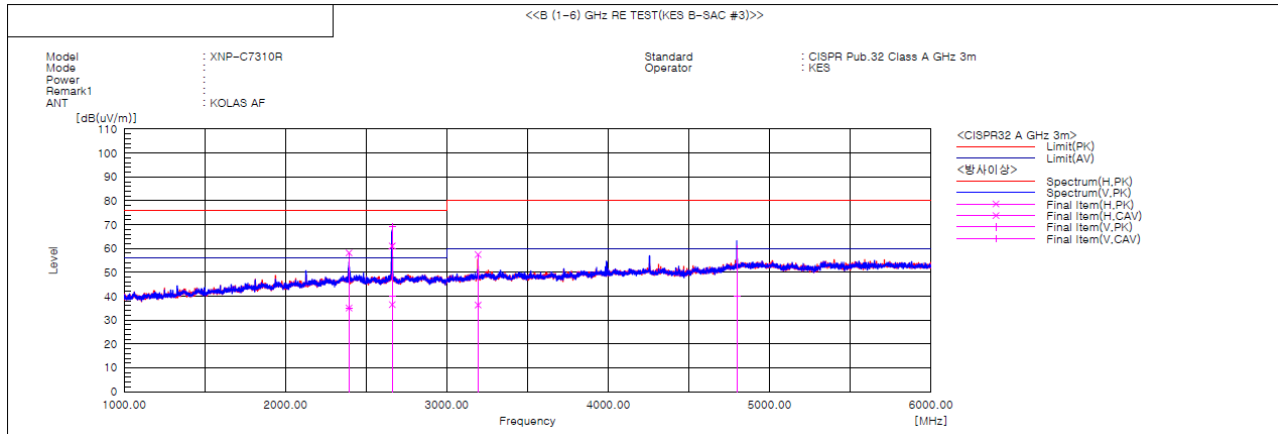
| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 35.578             | V   | 59.1                      | -23.9            | 35.2                       | 40.0                      | 4.8                  | 102.0          | 69.0           |        |
| 2   | 60.313             | V   | 57.1                      | -21.6            | 35.5                       | 40.0                      | 4.5                  | 100.0          | 99.0           |        |
| 3   | 95.718             | V   | 58.7                      | -22.4            | 36.3                       | 40.0                      | 3.7                  | 153.0          | 65.0           |        |
| 4   | 98.385             | H   | 49.1                      | -22.1            | 27.0                       | 40.0                      | 13.0                 | 390.0          | 163.0          |        |
| 5   | 227.638            | H   | 53.2                      | -19.3            | 33.9                       | 40.0                      | 6.1                  | 366.0          | 110.0          |        |
| 6   | 687.660            | H   | 43.1                      | -7.2             | 35.9                       | 47.0                      | 11.1                 | 372.0          | 50.0           |        |

### ◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1   | 2393.134        | H   | 51.9                | 28.8                 | 6.3           | 58.2                 | 35.1                  | 76.0                | 56.0                | 17.8           | 20.9            | 100.0       | 209.5       |        |
| 2   | 2393.832        | V   | 49.8                | 28.5                 | 6.3           | 56.1                 | 34.8                  | 76.0                | 56.0                | 19.9           | 21.2            | 100.0       | 274.8       |        |
| 3   | 2660.932        | V   | 62.2                | 33.1                 | 6.9           | 69.1                 | 40.0                  | 76.0                | 56.0                | 6.9            | 16.0            | 100.0       | 272.6       |        |
| 4   | 2660.935        | H   | 54.2                | 29.6                 | 6.9           | 61.1                 | 36.5                  | 76.0                | 56.0                | 14.9           | 19.5            | 100.0       | 5.7         |        |
| 5   | 3192.841        | H   | 48.9                | 27.7                 | 8.6           | 57.5                 | 36.3                  | 80.0                | 60.0                | 22.5           | 23.7            | 100.0       | 248.6       |        |
| 6   | 4797.554        | V   | 45.6                | 25.8                 | 14.3          | 59.9                 | 40.1                  | 80.0                | 60.0                | 20.1           | 19.9            | 100.0       | 175.3       |        |

**◆ 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

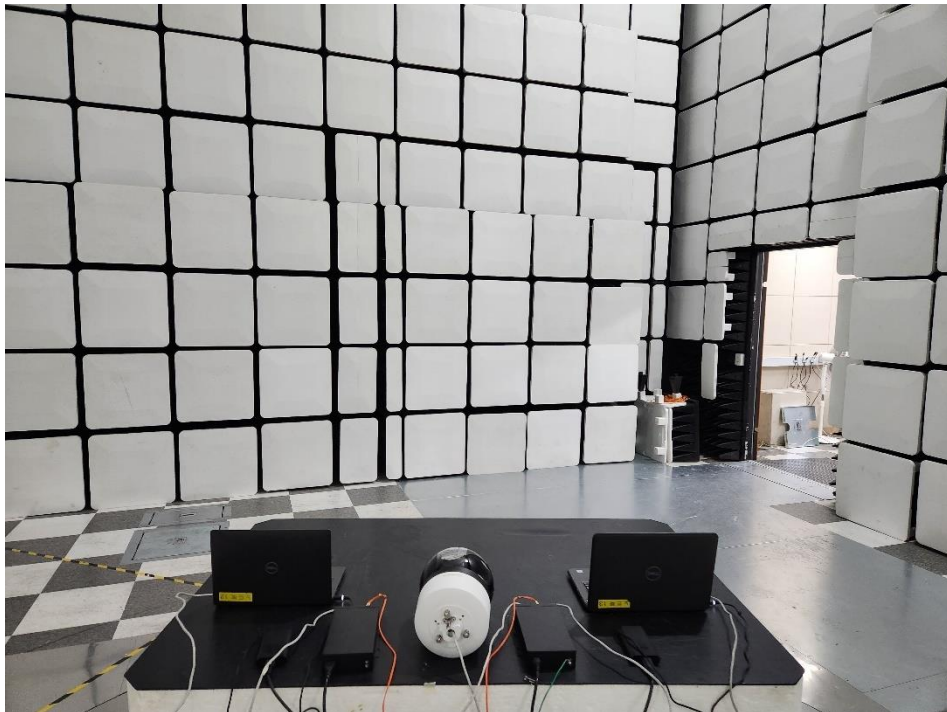
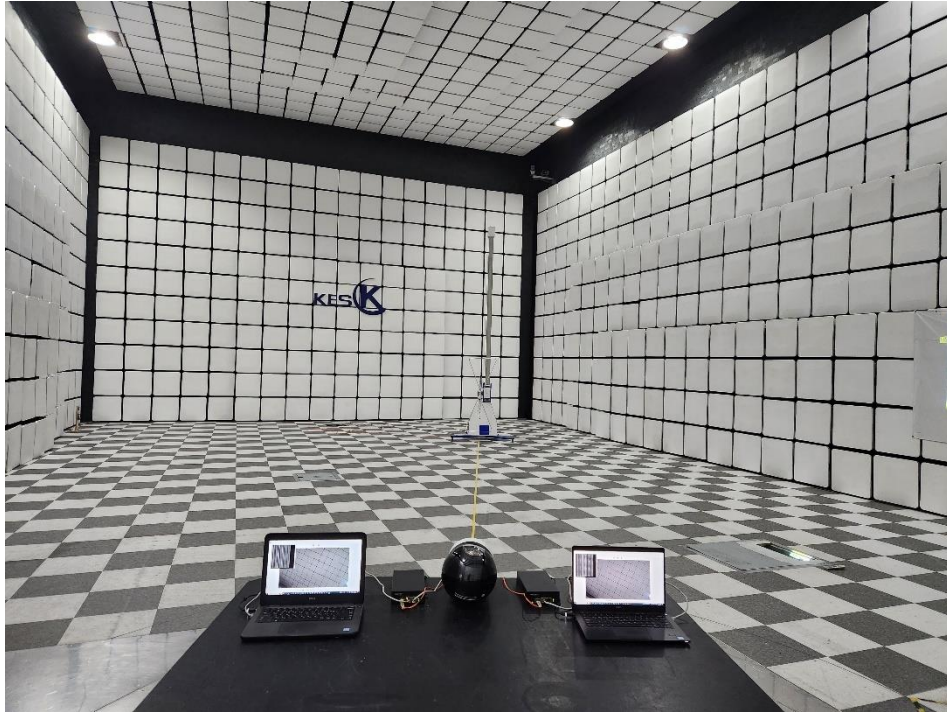
### Conducted Emissions at Mains Power Ports



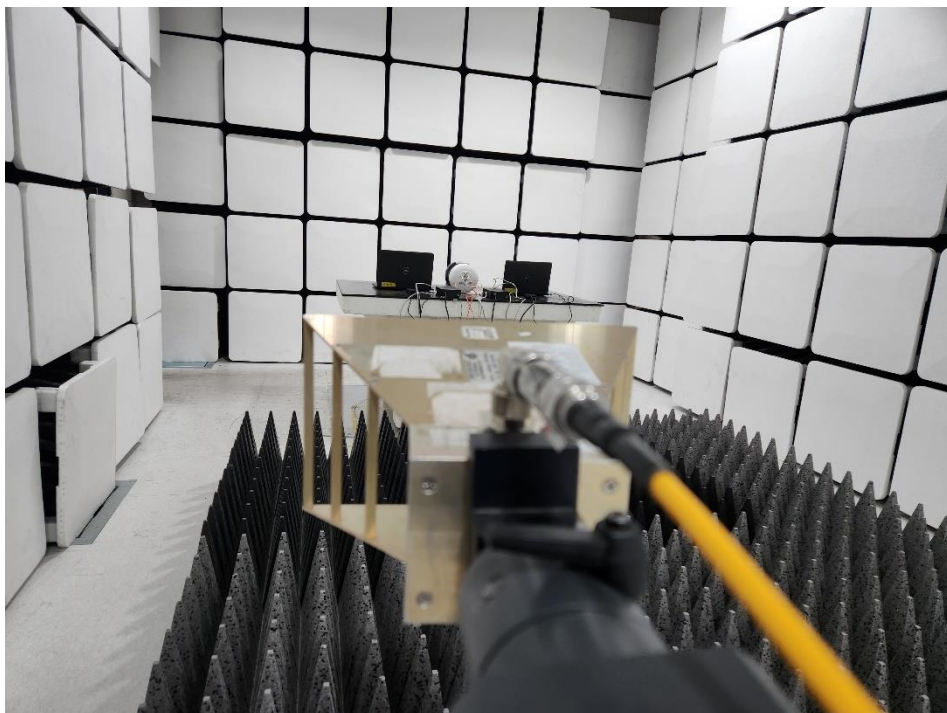
## Conducted Emissions at Telecommunication Ports



## Radiated Electric Field Emissions(Below 1 GHz)



## Radiated Electric Field Emissions(Above 1 GHz)



## EUT External Photographs

(Top)



(Bottom)



## EUT Internal Photographs

(Internal View)



## EUT Internal View – Board 1

(Top)

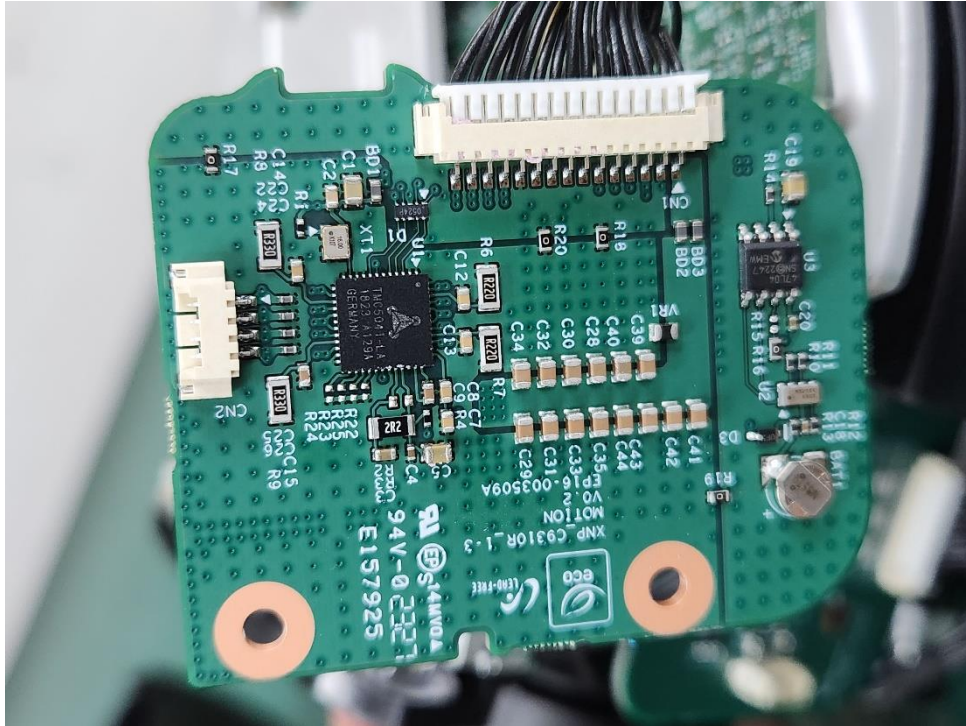


(Bottom)

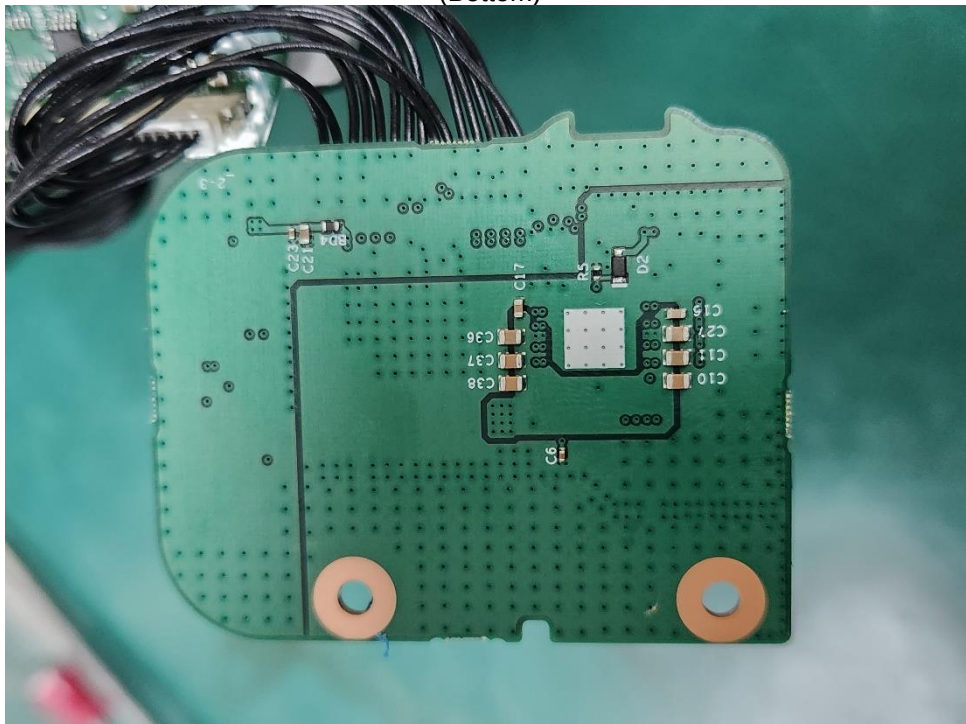


## EUT Internal View – Board 2

(Top)



(Bottom)

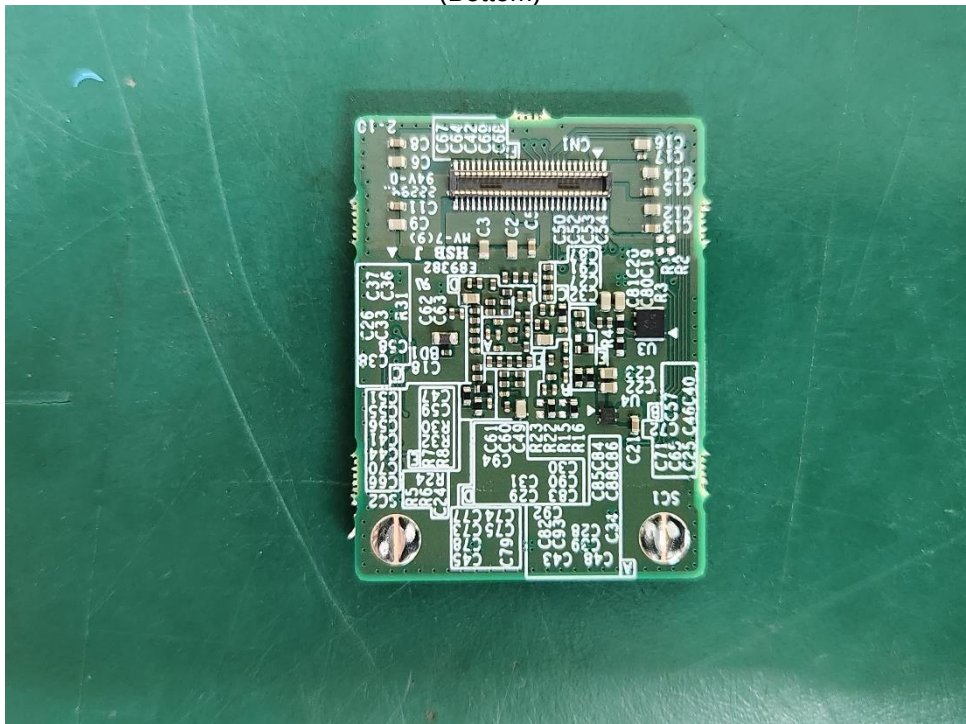


## EUT Internal View – Board 3

(Top)

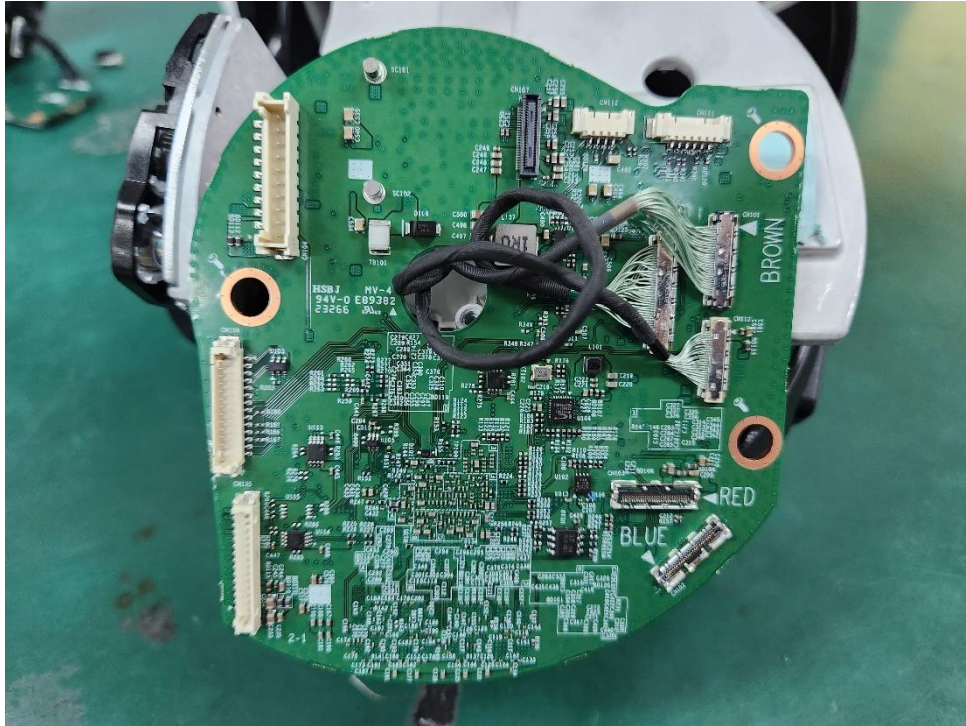


(Bottom)

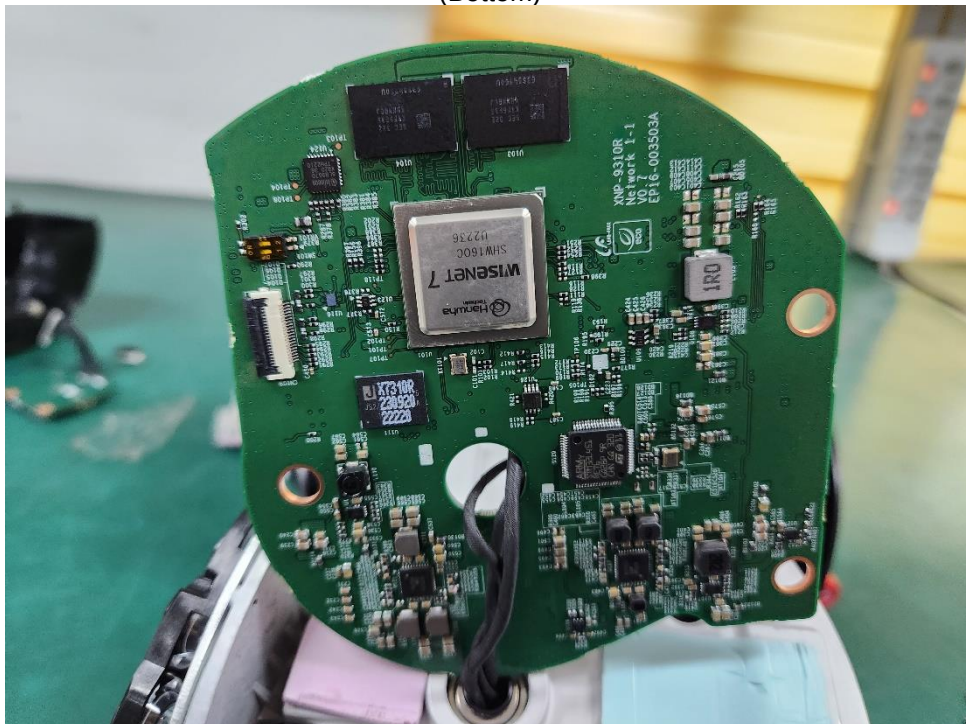


## EUT Internal View – Board 4

(Top)

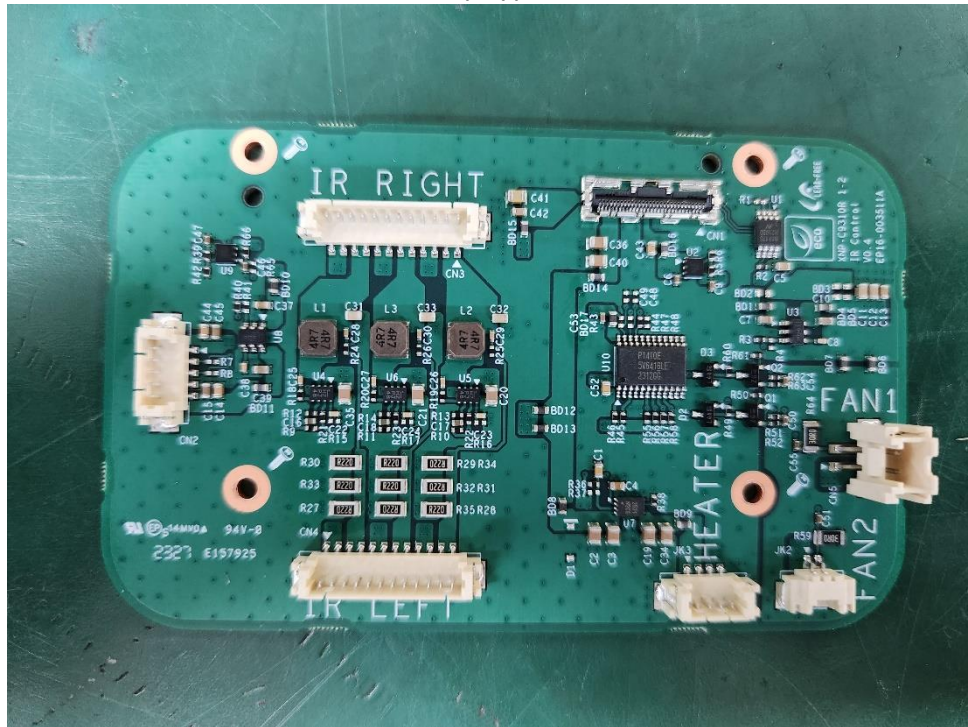


(Bottom)

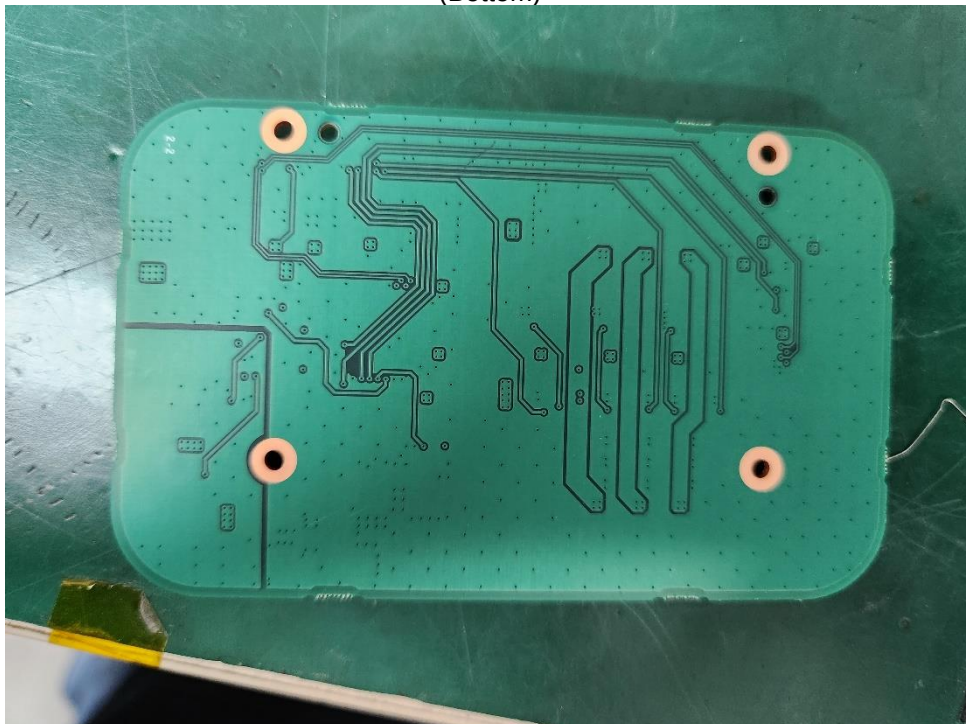


## EUT Internal View – Board 5

(Top)

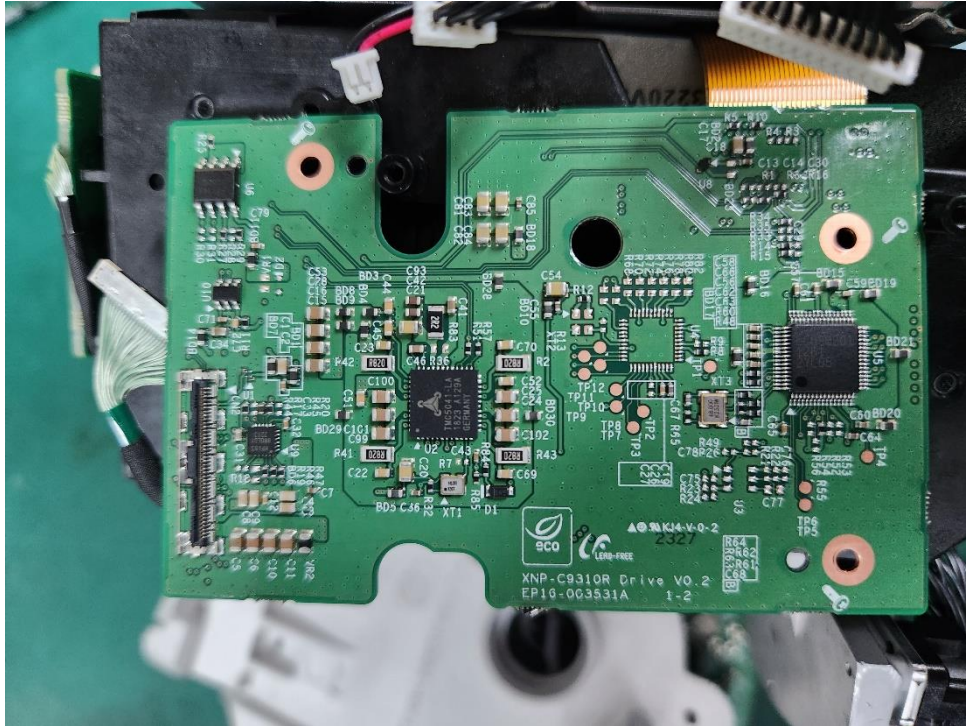


(Bottom)

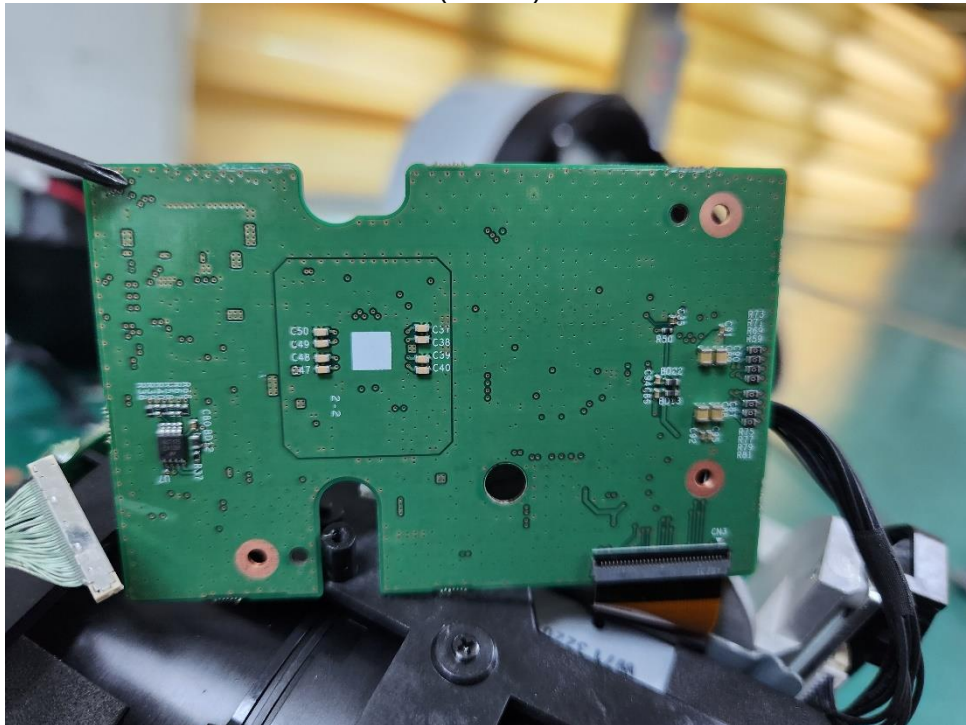


## EUT Internal View – Board 6

(Top)

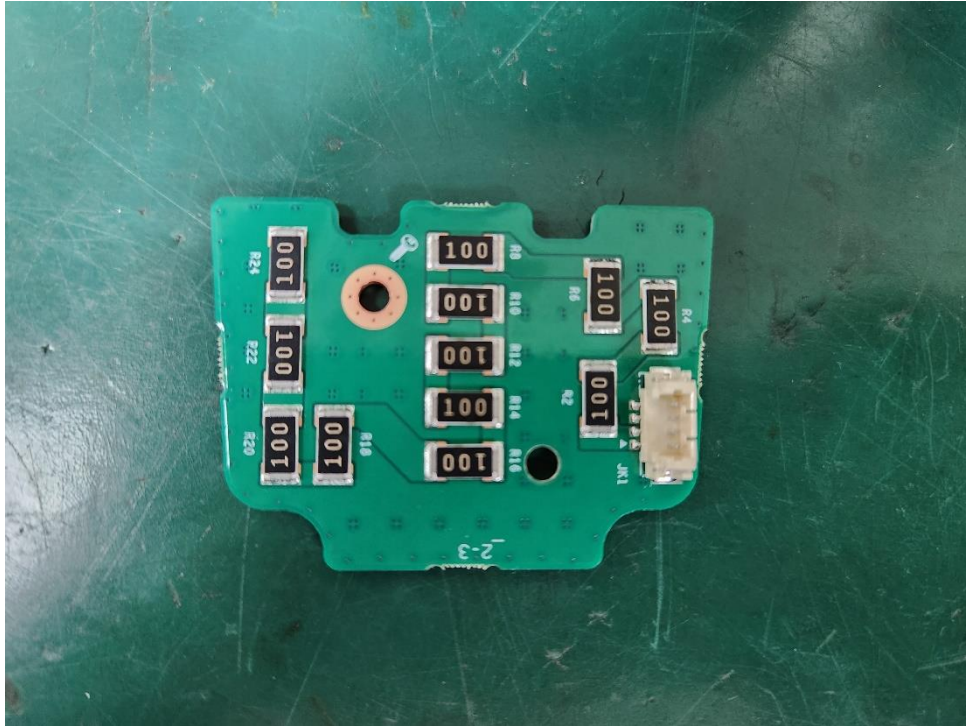


(Bottom)

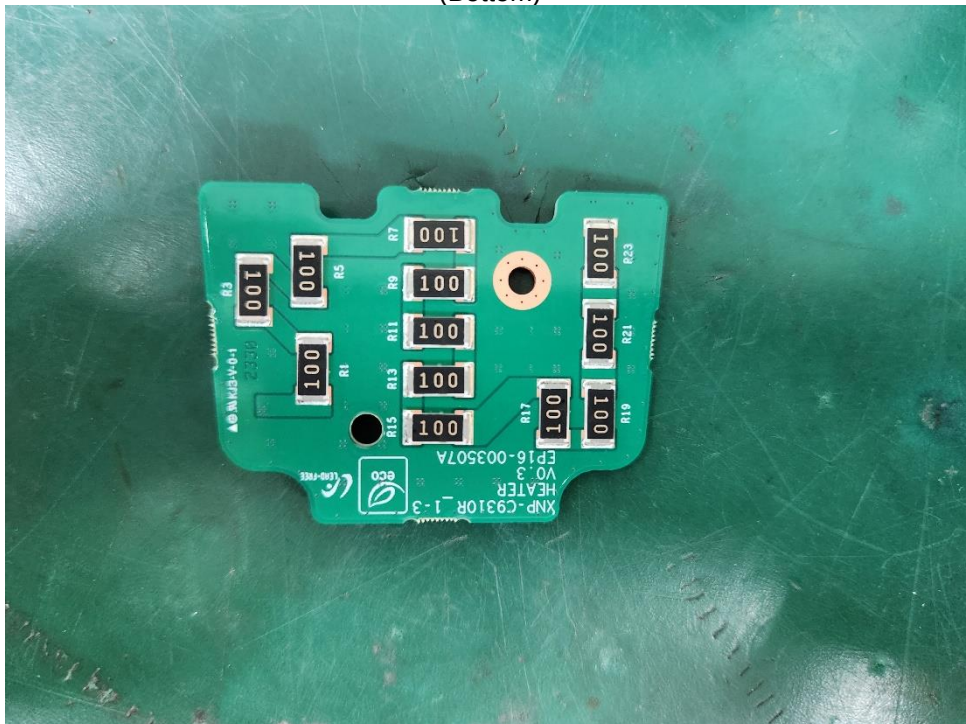


## EUT Internal View – Board 7

(Top)

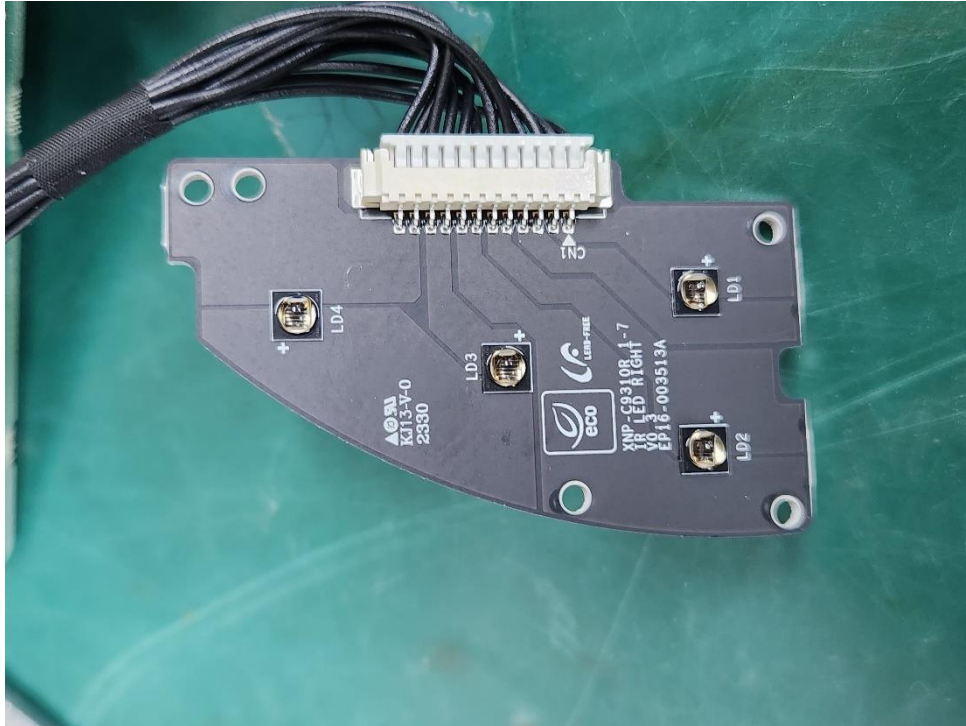


(Bottom)



## EUT Internal View – Board 8

(Top)

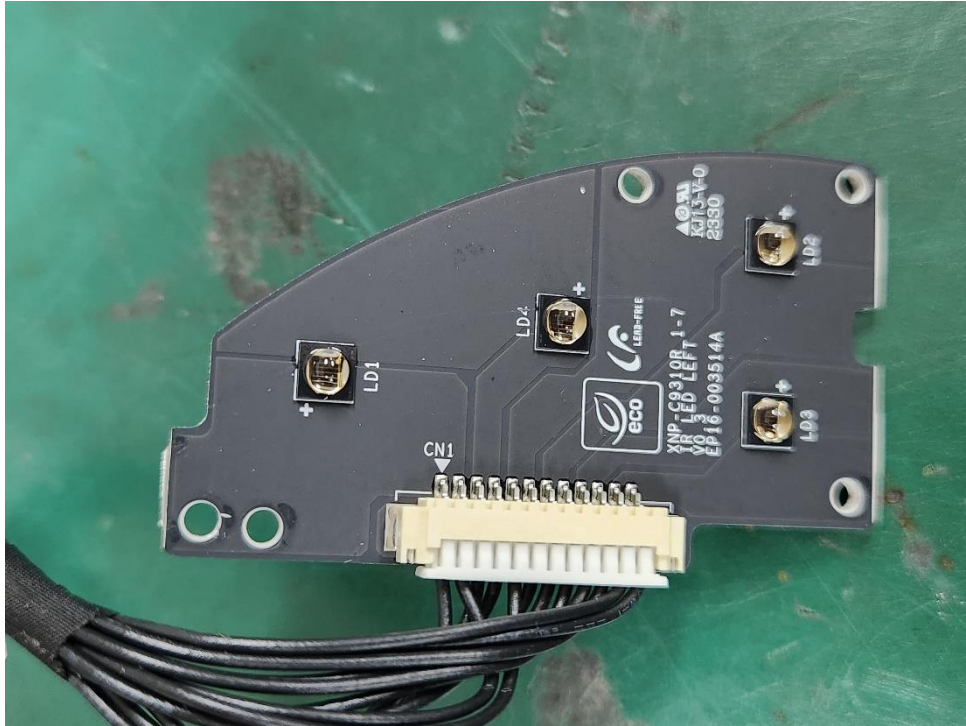


(Bottom)



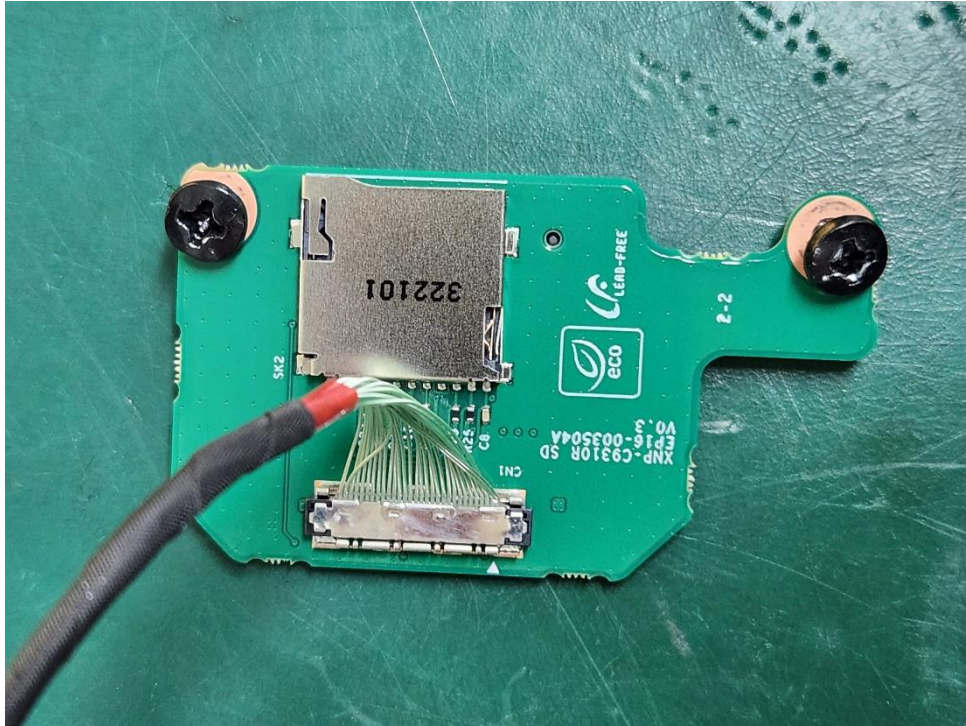
## EUT Internal View – Board 9

(Top)

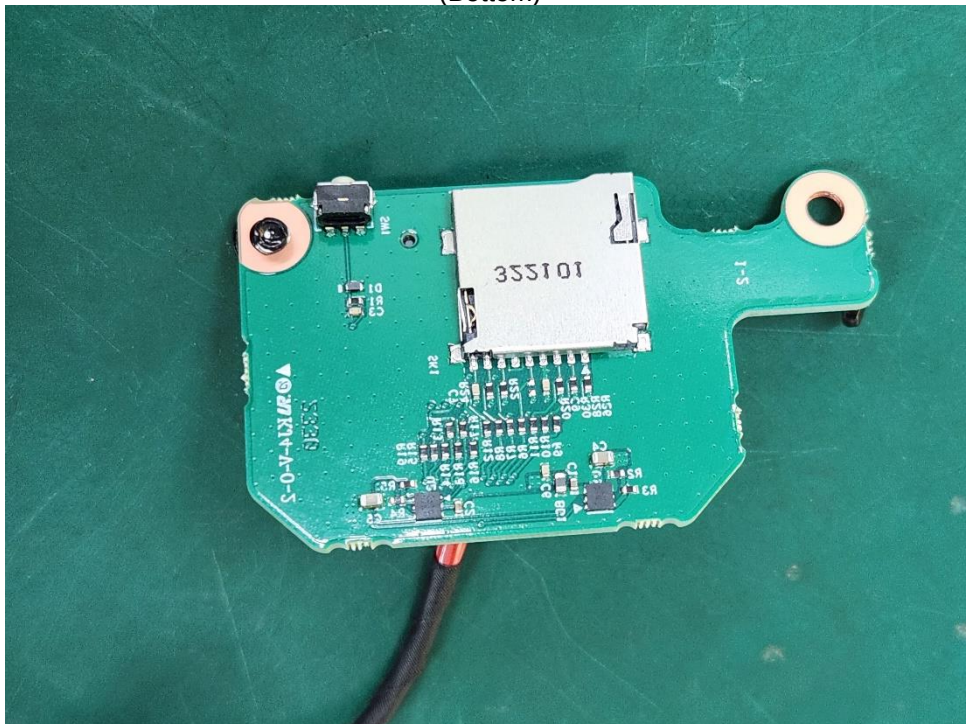


## EUT Internal View – Board 10

(Top)

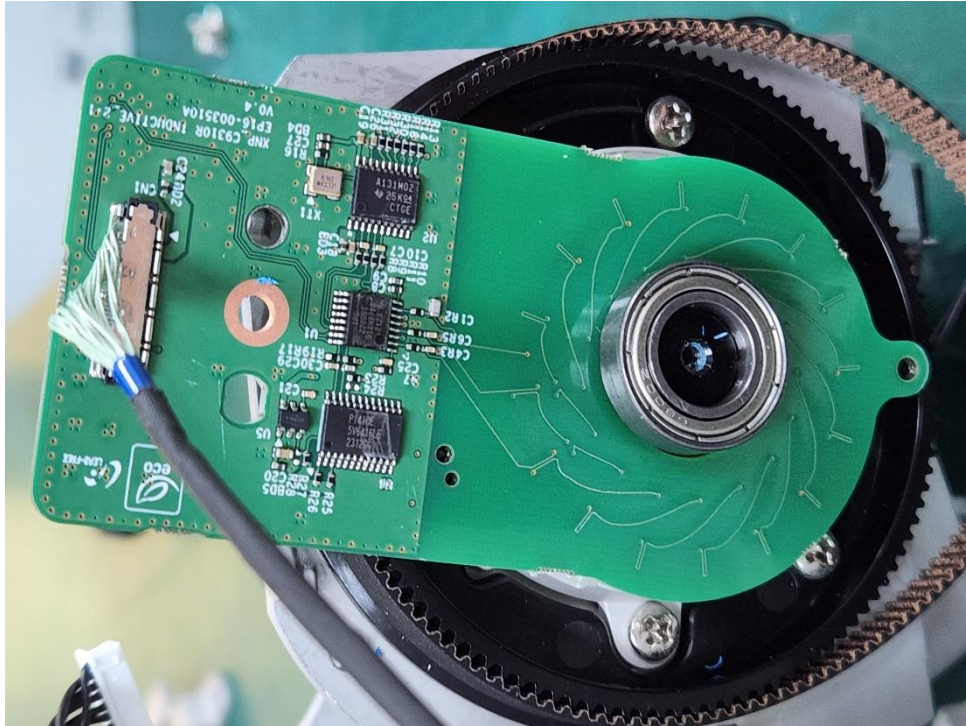


(Bottom)

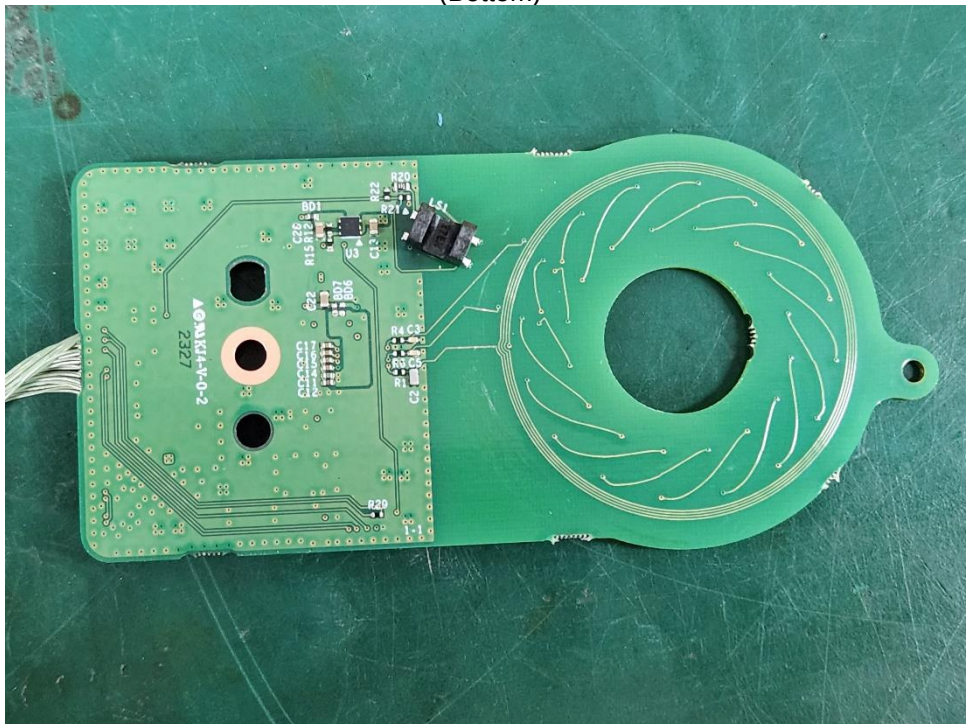


## EUT Internal View – Board 11

(Top)

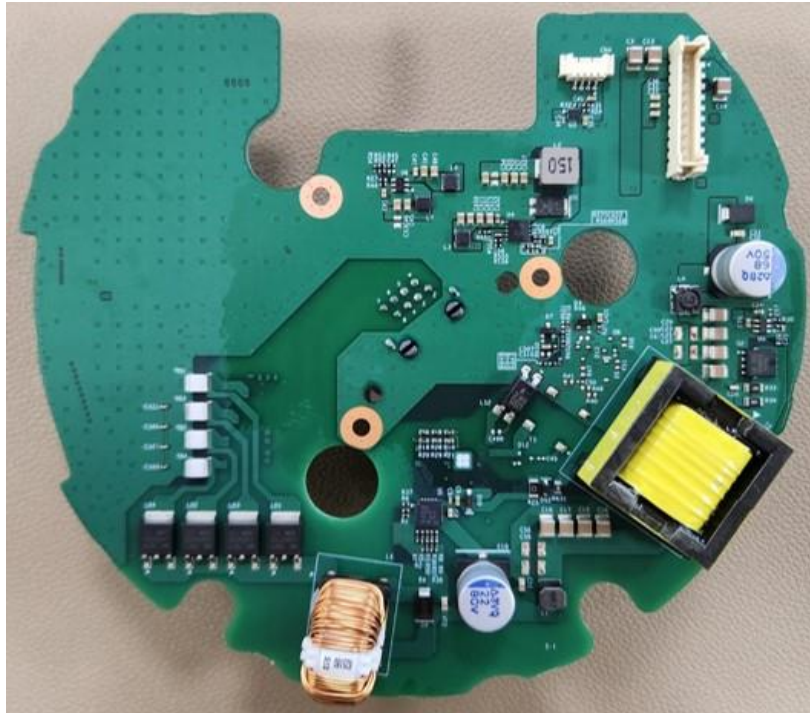


(Bottom)



## EUT Internal View – Board 12

(Top)

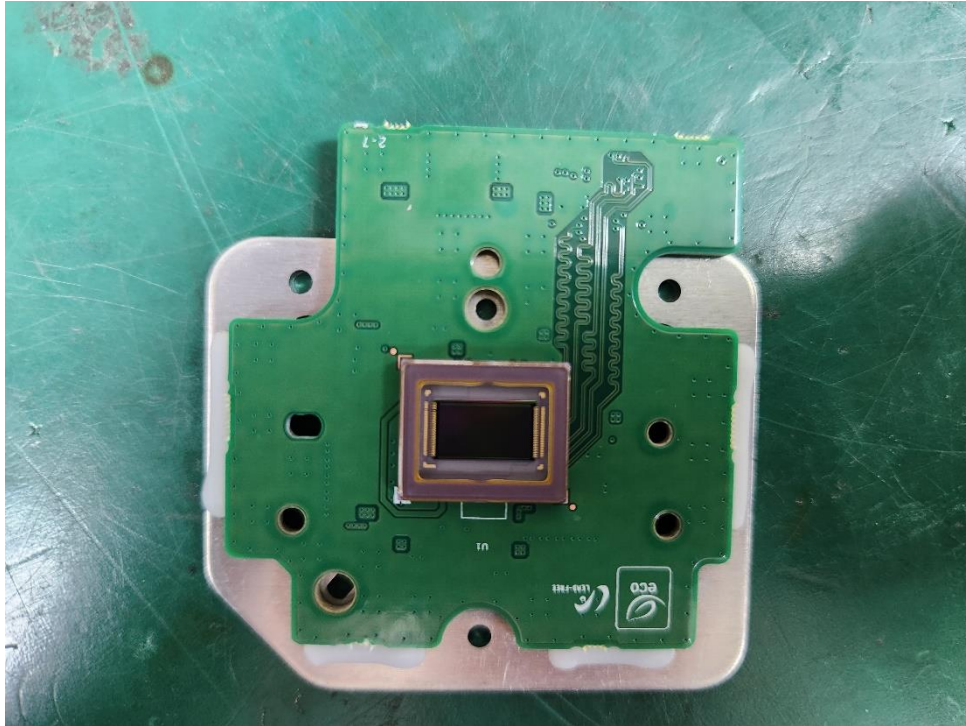


(Bottom)

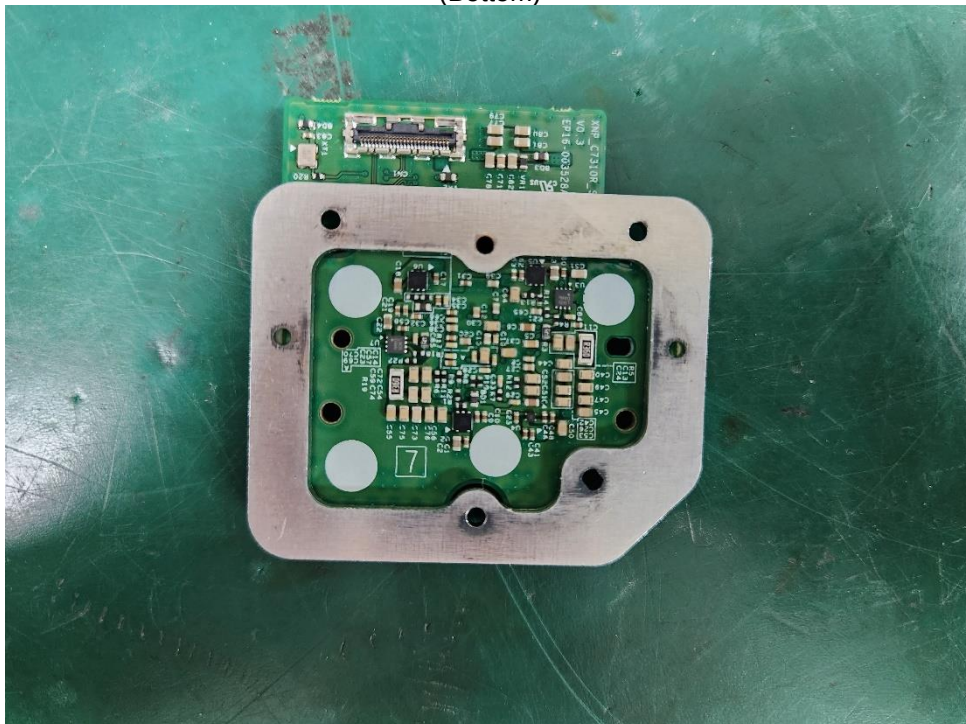


## EUT Internal View – CAMERA Board

(Top)



(Bottom)



## Label Photographs



この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A