# EMC TEST REPORT For RCM

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|---|---|---|
| Test Report No. | : | KES-EM-23T0058 |
| Date of Issue | : | Jan. 20, 2023 |
| Product name | : | NETWORK CAMERA |
| Model/Type No. | : | PNV-A6081R-E2T |
| Variant Model | : | - |
| Applicant | : | Hanwha Techwin Co., Ltd. |
| Applicant Address | : | 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea |
| Manufacturer | : | 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.<br>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<br>2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex) |
| Date of Receipt | : | Dec. 22, 2022 |
| Test date | : | Jan. 09, 2023 ~ Jan. 11, 2023 |
| Test Results | : | ☒ **In Compliance** ☐ **Not in Compliance** |

*Tested by*

김 세 헌

Se Heon, Kim
EMC Test Engineer

*Reviewed by*

Dong-Hun, Jang
EMC Technical Manager

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

# REPORT REVISION HISTORY

| Date | Test Report No. | Revision History |
|---|---|---|
| Jan. 20, 2023 | KES-EM-23T0058 | Issued |
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# 1.0 General Product Description

## Main Specifications of EUT are:

| | PNV-A6081R-E2T |
|---|---|
| **Video** | |
| Imaging Device | 1/2" CMOS |
| Resolution | 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360 |
| Max. Framerate | H.265/H.264: 2MP Max. 120fps/100fps/60fps/50fps/30fps/25fps(120Hz/100Hz/60Hz/50Hz/30Hz/25Hz)<br>MJPEG: 2MP Max. 30fps/30fps/30fps/30fps/30/fps/25fps(120Hz/100Hz/60Hz/50Hz/30Hz/25Hz) |
| NETD | None |
| Pixel Size | None |
| Min. Illumination | Color: 0.008Lux(F1.3, 1/30sec, 30IRE)<br>B/W: 0.0008Lux(F1.3, 1/30sec, 30IRE), 0Lux(IR LED on), 30/25fps<br><br>Color: 0.016Lux(F1.3, 1/60sec, 30IRE)<br>B/W: 0.0016Lux(F1.3, 1/60sec, 30IRE), 0Lux(IR LED on), 60/50fps<br><br>Color: 0.032Lux(F1.3, 1/120sec,30IRE)<br>B/W: 0.0032Lux(F1.3, 1/120sec, 30IRE), 0Lux(IR LED on), 120/100fps |
| Video Out | CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation |
| Video Transmission Distance | None |
| **Lens** | |
| Focal Length (Zoom Ratio) | 4.38~9.33mm(2.13x) motorized varifocal |
| Max. Aperture Ratio | F1.3(Wide)~F2.15(Tele) |
| Angular Field of View | H:103.1°(Wide)~44.5°(Tele)<br>V:54.2°(Wide)~24.9°(Tele)<br>D:124°(Wide)~51.1°(Tele) |
| Min. Object Distance | 0.5m(1.64ft) |
| Focus Control | Simple focus |
| Lens Type | P-iris(IR corrected) |
| Mount Type | None |
| Optional Lens | None |
| **Pan / Tilt / Rotate** | |
| Pan / Tilt / Rotate Range | 0°~360° / -45°~85° / 0°~355° |
| Pan Range | None |
| Pan Speed | None |
| Tilt Range | None |
| Tilt Speed | None |
| Rotate Range | None |
| Sequence | None |
| Preset Accuracy | None |
| **Operational** | |
| Camera Title | Displayed up to 85 characters |
| Direction Indicator | None |
| Day & Night | Auto(ICR) |
| Backlight Compensation | BLC, WDR, SSDR |
| Wide Dynamic Range | 120dB |
| Digital Noise Reduction | (Need to check)<br>WiseNRII(Based on AI engine), SSNRV |
| Digital Image Stabilization | None |
| Defog | None |
| Motion Detection | 8ea, 8point Polygonal zones |
| Privacy Masking | (Need to check)<br>6ea, Rectangular zones<br>- Color: Gray/Black/White |

| | |
|---|---|
| Gain Control | Low / Middle / High |
| White Balance | ATW / AWC / Manual / Indoor / Outdoor |
| LDC | Support |
| Electronic Shutter Speed | Minimum / Maximum / Prefer / Anti flicker(1/5~1/12,000sec)<br>Auto Prefer shutter control(Based on AI engine) |
| Digital PTZ | Support(preset/group) |
| Video Rotation | Flip, Mirror, Hallway view(90°/270°) |
| Analytics | (Need to check)<br>Classified object type: Person/Face/Vehicle/License plate<br>Attributes: Person(Gender, Color and Bag), Face(Age, Gender, Mask and Glasses), Vehicle(Type: car/bus/truck/motorcycle/bicycle and Color)<br>Support Bestshot per object<br>Analytics events based on AI engine<br>- Object detection, Virtual line*(Crossing/Direction), Virtual area*(Loitering/Intrusion/Enter/Exit), Face mask detection, Digital auto tracking, Social distancing detection<br>Analytics events<br>- Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Virtual area(Appear/Disappear) |
| Business Intelligence | None |
| Serial Interface | None |
| Alarm I/O | Input 1ea / Output 1ea |
| Alarm Triggers | Analytics, Network disconnect, Alarm input, App event, Time schedule, MQTT subscription |
| Alarm Events | When alarm trigger occurred<br>- File upload(image): e-mail/FTP<br>- Notification: e-mail<br>- Recording: SD/SDHC/SDXC or NAS recording at event triggers<br>- Alarm output<br>- Handover: PTZ preset, send message by HTTP/HTTPS/TCP<br>- Audio clip playback<br>- MQTT: publication |
| Audio In | Selectable(mic in/line in)<br>Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm |
| Audio Out | Line out, Max.output level: 1Vrms |
| IR Viewable Length | WiseIR 40m(131.23ft) |
| IR Illuminator (Optional) | None |
| Water Removal | None |
| Auto Tracking | None |
| Coaxial Protocol | None |
| Color Palettes | None |
| **Radiometry** | |
| Temperature Detect Range | None |
| Temperature Accuracy | None |
| Temperature Detection | None |
| Additional | None |
| **Network** | |
| Ethernet | Metal shielded RJ-45(10/100/1000BASE-T) |
| Video Compression | H.265/H.264: Main/High, MJPEG |
| Audio Compression | 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 |
| Smart Codec | Manual(5ea area), WiseStreamⅡ, WiseStreamⅢ(Based on AI engine) |
| Video Quality Adjustment | H.264/H.265: Target bitrate level control<br>MJPEG: Target bitrate level control |
| Bitrate Control | H.264/H.265: CBR or VBR<br>MJPEG: VBR |
| Streaming | Unicast(6 users) / Multicast<br>Multiple streaming(Up to 5 profiles) |
| Protocol | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP(TCP, UDP Unicast), MQTT |

| | |
|---|---|
| Security | TPM 2.0(FIPS 140-2 level 2)<br>HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access log<br>802.1X Authentication(EAP-TLS, EAP-LEAP)<br>Device Certificate(Hanwha Techwin Root CA, pre-installed)<br>Secure Boot, Verify firmware forgery |
| SIP support (VoIP, Peer-to-peer, SIP/I | None |
| Application Programming Interface | ONVIF Profile S/T/M<br>SUNAPI(HTTP API) |
| **General** | |
| Webpage Language | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Greek, Hungarian |
| Web Viewer | None |
| Edge Storage | 2TB SSD included(WAVE pre-installed)<br>Possible to register the maximum number of camera<br>- up to 6 camera(Host + 5 camera)<br>- Total bandwidth: up to 33Mbps<br>* Cannot support the camera when use AI mode |
| Memory | 4GB RAM, 512MB Flash |
| **Environmental & Electrical** | |
| Operating Temperature / Humidity | (TBD)<br>-20°C~+50°C(-4°F~+122°F) / 0~95%RH(non-condensing)<br>* Start up should be done at above -20°C<br>Humidity control /w AIR vent |
| Storage Temperature / Humidity | -50°C~+60°C(-58°F~+140°F) / 0~90% RH |
| Certification | IP66/IP67/IP6K9K, NEMA4X, IK10 |
| Input Voltage | PoE+(IEEE802.3at type 2, Class4), 12VDC |
| Power Consumption | (TBD)<br>PoE+: Max ??.?W, typical ??.?W<br>DC 12V: Max ??.?W, typical ??.?W |
| **Mechanical** | |
| Color / Material | White / Aluminum<br>Hard-coated dome bubble |
| RAL Code | RAL9003 |
| Product Dimensions / Weight | (TBD)<br>Ø180x130mm(7.09x5.12"), 1900g(4.19 lb) |
| Compatible Conduit hole / Gangbox | 19.1mm(3/4")(M25)<br>single, double, 4" octagon, 4" square |
| Hanging Mount (Dome) | SBP-187HMW |
| Skin Cover (Dome) | None |
| Weather Cap (Dome) | include |
| Power Module | None |
| Backbox | None |
| **Certifications & Standards** | |
| Network | None |
| EMC | FCC 47 CFR 15 Subpart B Class A<br>ICES-3(A)/NMB-3(A)<br>CE/UKCA<br>- EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3<br>VCCI CISPR 32 Class A<br>RCM AS/NZS CISPR 32 Class A<br>KS C 9832 Class A , KS C 9835 |
| Safety | UL 62368-1, CAN/CSA C22.2 NO. 62368-1<br>IEC/EN 62471 |
| Environment | IEC/EN 63000<br>IEC/EN 60529 IP66/IP67, ISO 20653 IP6K9K, IEC/EN 62262 IK10<br>NEMA 250 type 4X |
| Video | None |
| **DORI (EN62676-4 standard)** | |
| Detect (25PPM/ 8PPF) | Wide: 30.5m(100.03ft) / Tele: 93.9m(307.95ft) |
| Observe (63PPM/ 19PPF) | Wide: 12.2m(40.01ft) / Tele: 37.5m(123.18ft) |
| Recognize (125PPM/ 38PPF) | Wide: 6.1m(20.01ft) / Tele: 18.8m(61.59ft) |
| Identify (250PPM/ 76PPF) | Wide: 3.0m(10.00ft) / Tele: 9.4m(30.79ft) |

## 1.1 Test Voltage & Frequency

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

☒ AC 240 V, 50 Hz ☒ PoE

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|
| NETWORK CAMERA | PNV-A6081R-E2T | - | HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. | EUT |
| M.2 SSD | TS2TMTS952T2-HWT | - | Transcend | 2 TB |

## 1.5 Support Equipments

| Description | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|
| Adaptor | FSP060-DIBAN2 | - | Zhonghan Electronics (Shenzhen) Co.,Ltd. | - |
| PoE Adaptor | PT-PSE109GBRO-AH | - | Dongguan PROCET Network Technology Co.,Ltd | - |
| Notebook | LG15N54 | 503NZWY038929 | LG Electronics | - |
| Notebook Adaptor | PA-1900-14 | OF2R263348701 7764 | LITE-ON TECHNOLOGY COPORATION | - |
| Alarm | PRO-SL | - | SENSOR PRO | - |
| Button Alarm | - | - | - | - |
| Smartphone | - | - | SAMSUNG | - |
| Headset | K550 | - | Britz® | - |
| Micro SD Card1 | - | - | Sandisk | 8 GB |
| Micro SD Card2 | - | - | Sandisk | 8 GB |

## 1.6 External I/O Cabling

■ DC Mode

| Start | | END | | Cable Spec. | |
|---|---|---|---|---|---|
| Description | I/O Port | Description | I/O Port | Length | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (LAN) | Notebook | RJ-45 (LAN) | 4.0 | S |
| | Slot | Micro SD Card1 | Slot | - | - |
| | Slot | Micro SD Card2 | Slot | - | - |
| | Alarm OUT | Alarm | Alarm IN | 3.0 | U |
| | Alarm IN | Button Alarm | Alarm OUT | 3.0 | U |
| | Audio IN | Headset | Audio IN | 1.7 | U |
| | Audio OUT | | Audio OUT | 1.7 | U |
| | DC IN | Adaptor | DC OUT | 1.5 | U |
| Notebook | 3.5 mm | Smartphone | 3.5 mm | 1.3 | U |
| | DC JACK | Notebook Adaptor | DC JACK | 1.5 | U |

* Unshielded=U, Shielded=S

■ PoE Mode

| Start | | END | | Cable Spec. | |
|---|---|---|---|---|---|
| Description | I/O Port | Description | I/O Port | Length | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (PoE) | PoE Adaptor | RJ-45 (PoE) | 4.0 | S |
| | Slot | Micro SD Card1 | Slot | - | - |
| | Slot | Micro SD Card2 | Slot | - | - |
| | Alarm OUT | Alarm | Alarm IN | 3.0 | U |
| | Alarm IN | Button Alarm | Alarm OUT | 3.0 | U |
| | Audio IN | Headset | Audio IN | 1.7 | U |
| | Audio OUT | | Audio OUT | 1.7 | U |
| Notebook | RJ-45 (LAN) | PoE Adaptor | RJ-45 (LAN) | 1.5 | S |
| | 3.5 mm | Smartphone | 3.5 mm | 1.3 | U |
| | DC JACK | Notebook Adaptor | DC JACK | 1.5 | U |

* Unshielded=U, Shielded=S

## 1.7 EUT Operating Mode(s)

■ DC Mode, PoE Mode

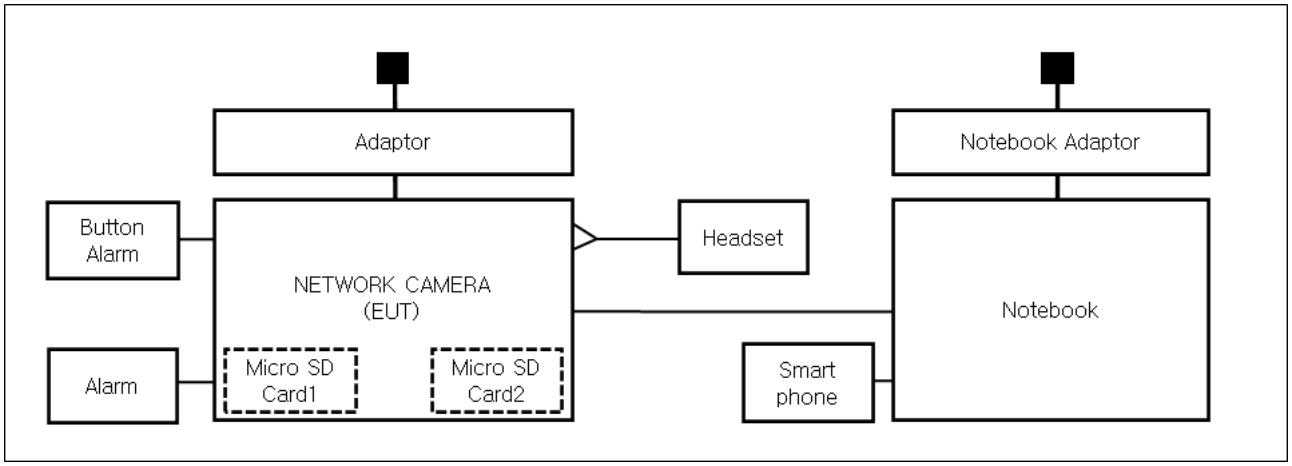
| Test Mode | operating |
|---|---|
| Operating | 1. Check the camera video output on the laptop<br>2. Check if the network status is operating normally during PING TEST<br>3. Check the output of the 1 kHz tone output from the smartphone and the microphone input from the headset<br>4. Press the alarm button to check the normal operation of the button alarm.<br>5. After testing, I checked the files stored on Micro SD cards1,2 and SSD. |

| EUT Test operating S/W | | |
|---|---|---|
| **Name** | **Version** | **Manufacture Company** |
| - | - | - |

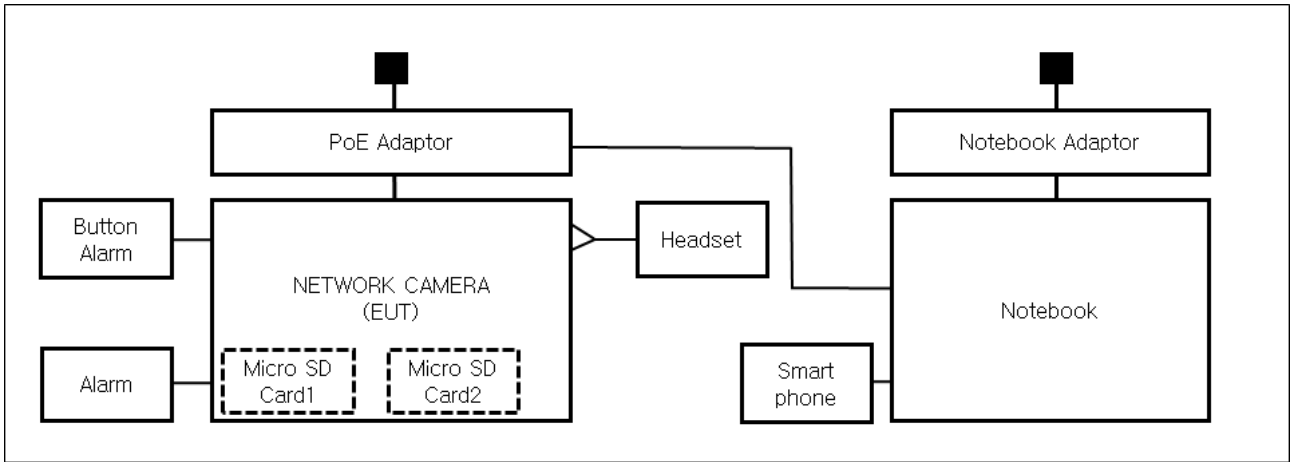
## 1.8 Configuration

■ AC Main
□ DC Main

■ DC Mode




■ PoE Mode



## 1.9 Remarks when standards applied

- VIDEO port is for administrator use and is excluded from testing.
- In PoE mode, the LAN port is regarded as a wired communication network port and power-related ports are not tested.

## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeoju-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 , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | KR0100 |
| International | **KOLAS** | EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | KT489 |
| USA | **FCC** | 3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements. | KR0100 |
| Canada | **ISED** | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site | 23298 |
| JAPAN | **VCCI** | Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz | R-20056, C-20036, T-20040, G-20057 |
| Europe | **TÜV SÜD** | EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | CARAT 001633 0004 |

# 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
Jan. 09, 2023

### Test Location
Electro wave Shieldroom #6

### Test Equipment

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EMC32 | R & S | 9.12.00 | - |
| ☒ | EMI TEST RECEIVER | ESR3 | R & S | 101783 | 11, 11, 2023 |
| ☒ | LISN | ENV216 | R & S | 101787 | 11, 10, 2023 |
| ☒ | LISN | ESH2-Z5 | R & S | 100450 | 11, 10, 2023 |
| ☒ | PULSE LIMITER | ESH3-Z2 | R & S | 101915 | 11, 10, 2023 |

### Test Conditions
Temperature: (22,1 ± 0,0) ℃
Relative Humidity: (44,8 ± 0,0) % R.H.

### Frequency Range of Measurement
150 ㎑ to 30 ㎒

### Instrument Settings
IF Band Width: 9 ㎑

### 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
Jan. 09, 2023

### Test Location
Electro wave Shieldroom #6

### Test Equipment

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EMC32 | R & S | 9.12.00 | - |
| ☒ | EMI TEST RECEIVER | ESR3 | R & S | 101783 | 11, 11, 2023 |
| ☒ | LISN | ENV216 | R & S | 101787 | 11, 10, 2023 |
| ☒ | LISN | ESH2-Z5 | R & S | 100450 | 11, 10, 2023 |
| ☒ | PULSE LIMITER | ESH3-Z2 | R & S | 101915 | 11, 10, 2023 |
| ☒ | ISN | ISN S8 | SCHWARZBECK | ISN-S8-0019 | 03, 07, 2023 |

### Test Conditions
Temperature: (22,1 ± 0,0) ℃
Relative Humidity: (44,8 ± 0,0) % R.H.

### Frequency Range of Measurement
150 ㎑ to 30 ㎒

### Instrument Settings
IF Band Width: 9 ㎑

### 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 ㎓)

### Test Date
Jan. 11, 2023

### Test Location
☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10m)

### Test Equipment

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EP5/RE | TOYO Corporation | 6.0.0 | - |
| ☒ | EMI TEST RECEIVER | ESU26 | R & S | 100551 | 03, 31, 2023 |
| ☒ | AMPLIFIER | SCU 01 | R & S | 100603 | 11, 10, 2023 |
| ☒ | TRILOG-BROADBAND ANTENNA | VULB9163 | Schwarzbeck | 715 | 11, 17, 2024 |
| ☒ | ATTENUATOR | 8491A | HP | 32173 | 03, 08, 2023 |

### Test Conditions
Temperature: (22,2 ± 0,1) ℃
Relative Humidity: (45,0 ± 0,0) % R.H.

### Frequency Range of Measurement
30 ㎒ to 1 ㎓

### Instrument Settings
IF Band Width: 120 ㎑

### 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 ㎓)

### Test Date
Jan. 10, 2023

### Test Location
SEMI ANECHOIC CHAMBER #5

### Test Equipment

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | ES10/RE | TOYO Corporation | 2022.01.000 | - |
| ☒ | EMI TEST RECEIVER | ESU26 | Rohde & Schwarz | 100552 | 03, 31, 2023 |
| ☒ | HORN ANTENNA | BBHA 9120D | SCHWARZBECK | 9120D-1802 | 11, 08, 2023 |
| ☒ | PREAMPLIFIER | 8449B | HP | 3008A00538 | 06, 02, 2023 |
| ☒ | ATTENUATOR | 8491B | HP | 23094 | 04, 21, 2023 |

### Test Conditions
Temperature: (23,0 ± 0,1) ℃
Relative Humidity: (45,4 ± 0,1) % R.H.

### Frequency Range of Measurement
1 ㎓ to 6 ㎓

### Instrument Settings
IF Band Width: 1 ㎒

### 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

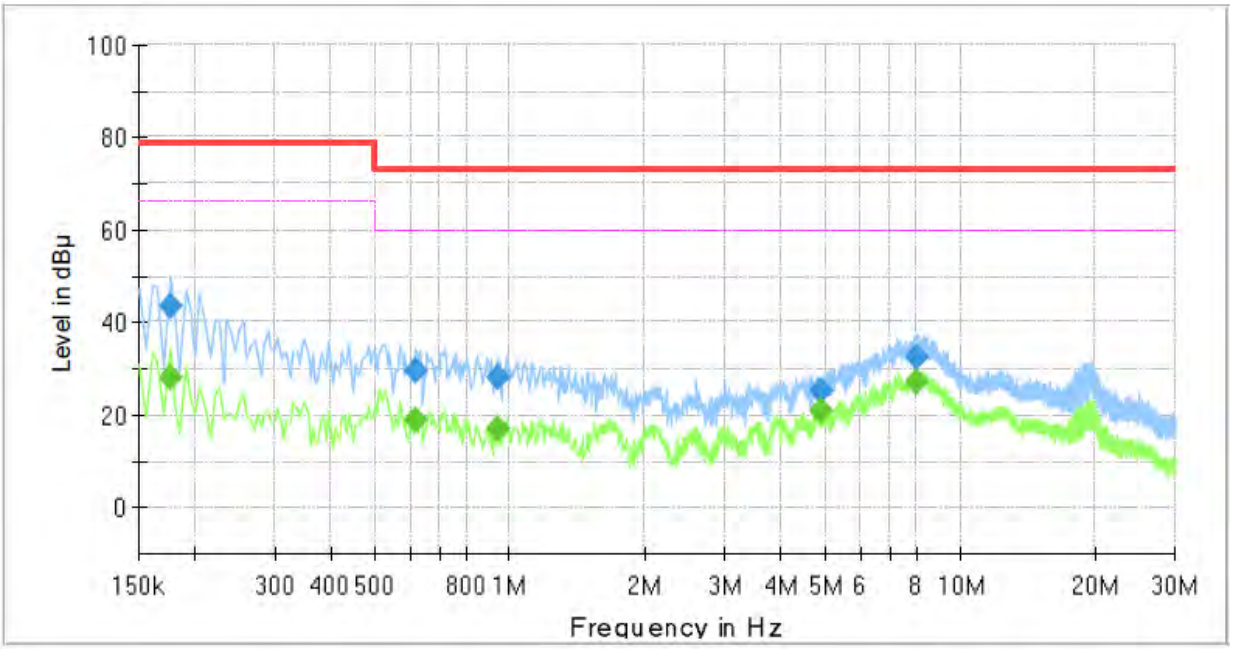
## Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

## Common Information

| | |
|---|---|
| Test Description: | Conducted Emission |
| Model No.: | PNV-A6081R-E2T |
| Phase: | L1 |
| Mode: | DC |
| Operator Name: | KES |



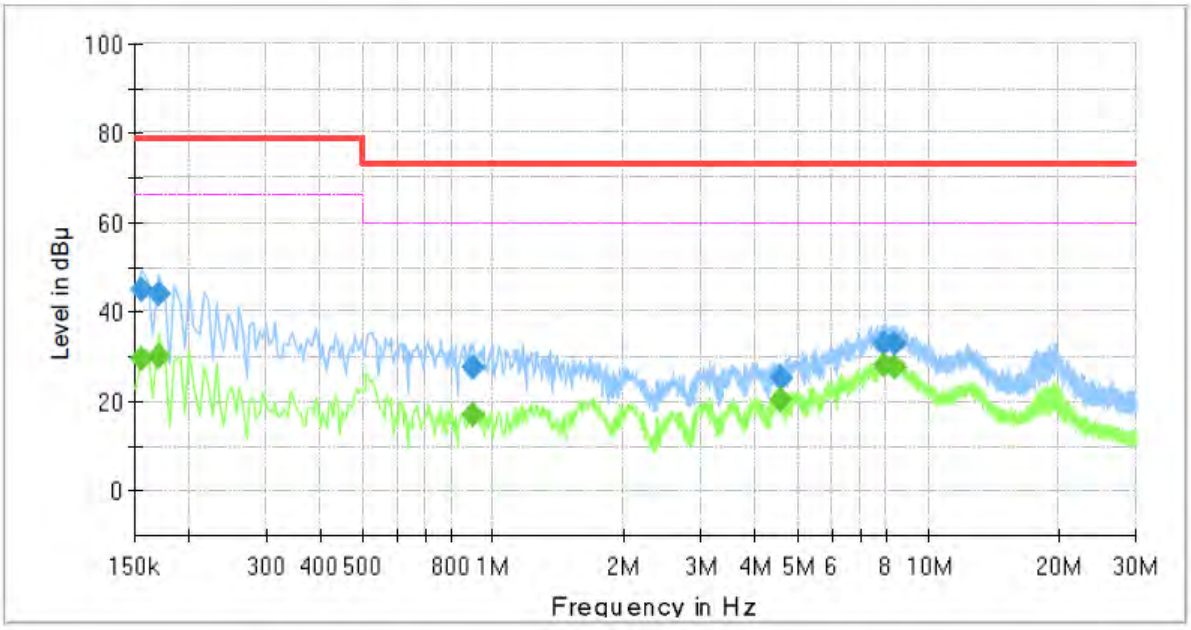

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.175000 | 43.47 | --- | 79.00 | 35.53 | 1000.0 | 9.000 | L1 | 19.5 |
| 0.175000 | --- | 27.94 | 66.00 | 38.06 | 1000.0 | 9.000 | L1 | 19.5 |
| 0.615000 | --- | 19.02 | 60.00 | 40.98 | 1000.0 | 9.000 | L1 | 19.9 |
| 0.615000 | 29.73 | --- | 73.00 | 43.27 | 1000.0 | 9.000 | L1 | 19.9 |
| 0.935000 | --- | 16.82 | 60.00 | 43.18 | 1000.0 | 9.000 | L1 | 20.1 |
| 0.935000 | 27.91 | --- | 73.00 | 45.09 | 1000.0 | 9.000 | L1 | 20.1 |
| 4.920000 | 25.28 | --- | 73.00 | 47.72 | 1000.0 | 9.000 | L1 | 19.7 |
| 4.920000 | --- | 20.70 | 60.00 | 39.30 | 1000.0 | 9.000 | L1 | 19.7 |
| 8.020000 | --- | 27.23 | 60.00 | 32.77 | 1000.0 | 9.000 | L1 | 19.7 |
| 8.020000 | 32.35 | --- | 73.00 | 40.65 | 1000.0 | 9.000 | L1 | 19.7 |

NEUTRAL LINE

## Common Information

| | |
|---|---|
| Test Description: | Conducted Emission |
| Model No.: | PNV-A6081R-E2T |
| Phase: | N |
| Mode: | DC |
| 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 | --- | 29.61 | 66.00 | 36.39 | 1000.0 | 9.000 | N | 19.4 |
| 0.155000 | 45.15 | --- | 79.00 | 33.85 | 1000.0 | 9.000 | N | 19.4 |
| 0.170000 | --- | 30.06 | 66.00 | 35.94 | 1000.0 | 9.000 | N | 19.4 |
| 0.170000 | 44.04 | --- | 79.00 | 34.96 | 1000.0 | 9.000 | N | 19.4 |
| 0.900000 | --- | 17.13 | 60.00 | 42.87 | 1000.0 | 9.000 | N | 20.1 |
| 0.900000 | 27.50 | --- | 73.00 | 45.50 | 1000.0 | 9.000 | N | 20.1 |
| 4.555000 | --- | 20.36 | 60.00 | 39.64 | 1000.0 | 9.000 | N | 19.8 |
| 4.555000 | 25.10 | --- | 73.00 | 47.90 | 1000.0 | 9.000 | N | 19.8 |
| 7.900000 | --- | 27.93 | 60.00 | 32.07 | 1000.0 | 9.000 | N | 19.6 |
| 7.900000 | 33.00 | --- | 73.00 | 40.00 | 1000.0 | 9.000 | N | 19.6 |
| 8.400000 | --- | 27.84 | 60.00 | 32.16 | 1000.0 | 9.000 | N | 19.7 |
| 8.400000 | 32.93 | --- | 73.00 | 40.07 | 1000.0 | 9.000 | N | 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

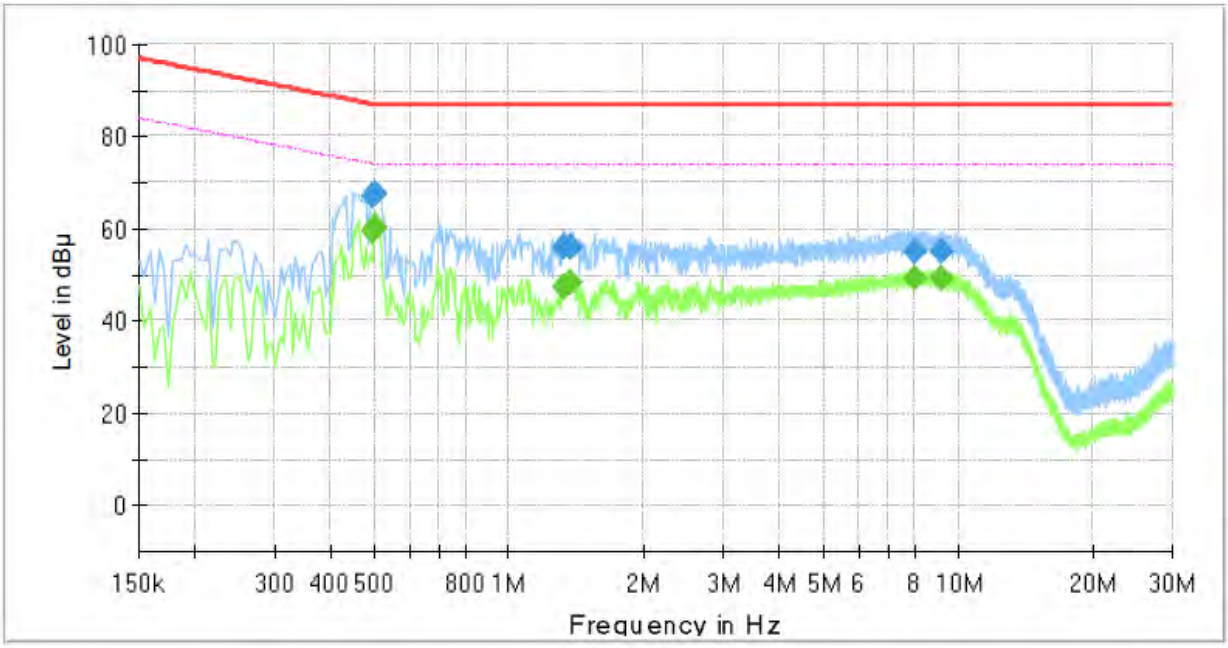
## Conducted Emissions at Telecommunication Ports

■ DC Mode

**[1 000 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | PNV-A6081R-E2T |
| Mode : | DC |
| Speed : | 1 000 Mbps |
| Operator Name: | KES |




## Final_Result

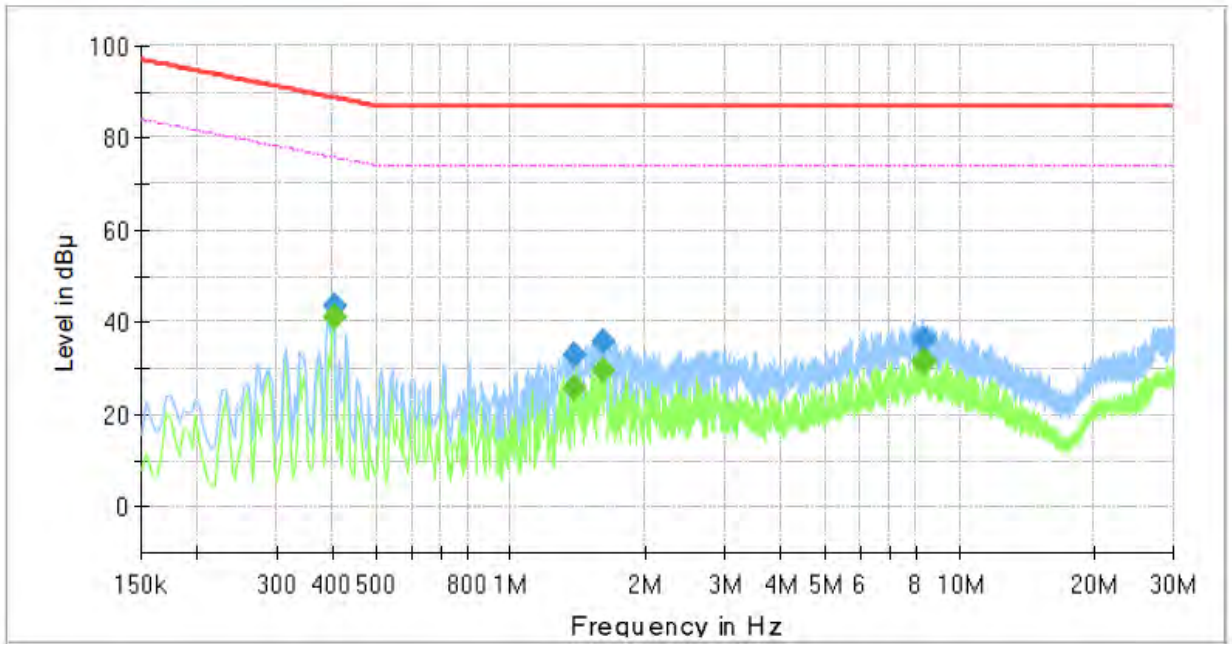
| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.498000 | --- | 59.24 | 74.03 | 14.79 | 1000.0 | 9.000 | Single Line | 19.6 |
| 0.498000 | 67.38 | --- | 87.03 | 19.65 | 1000.0 | 9.000 | Single Line | 19.6 |
| 0.502000 | --- | 60.57 | 74.00 | 13.43 | 1000.0 | 9.000 | Single Line | 19.6 |
| 0.502000 | 67.45 | --- | 87.00 | 19.55 | 1000.0 | 9.000 | Single Line | 19.6 |
| 1.326000 | --- | 47.51 | 74.00 | 26.49 | 1000.0 | 9.000 | Single Line | 20.0 |
| 1.326000 | 55.94 | --- | 87.00 | 31.06 | 1000.0 | 9.000 | Single Line | 20.0 |
| 1.370000 | --- | 48.52 | 74.00 | 25.48 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.370000 | 56.24 | --- | 87.00 | 30.76 | 1000.0 | 9.000 | Single Line | 20.1 |
| 7.958000 | --- | 49.39 | 74.00 | 24.61 | 1000.0 | 9.000 | Single Line | 19.4 |
| 7.958000 | 55.08 | --- | 87.00 | 31.92 | 1000.0 | 9.000 | Single Line | 19.4 |
| 9.186000 | --- | 49.40 | 74.00 | 24.60 | 1000.0 | 9.000 | Single Line | 19.6 |
| 9.186000 | 55.00 | --- | 87.00 | 32.00 | 1000.0 | 9.000 | Single Line | 19.6 |

■ PoE Mode

**[1 000 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | PNV-A6081R-E2T |
| Mode : | PoE |
| Speed : | 1 000 Mbps |
| Operator Name: | KES |



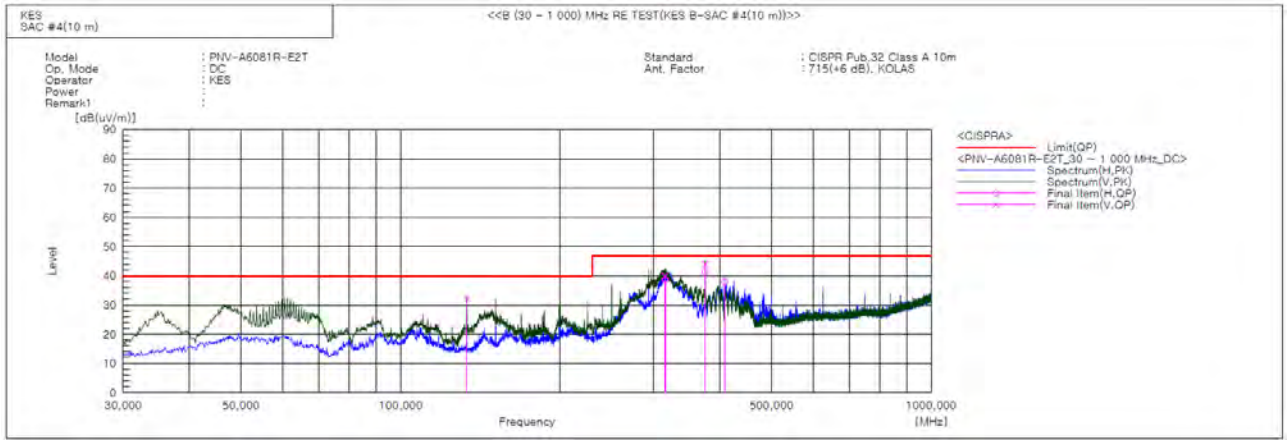

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.402000 | --- | 40.99 | 75.81 | 34.82 | 1000.0 | 9.000 | Single Line | 19.4 |
| 0.402000 | 43.35 | --- | 88.81 | 45.46 | 1000.0 | 9.000 | Single Line | 19.4 |
| 1.378000 | --- | 25.56 | 74.00 | 48.44 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.378000 | 32.85 | --- | 87.00 | 54.15 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.598000 | --- | 29.34 | 74.00 | 44.66 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.598000 | 35.72 | --- | 87.00 | 51.28 | 1000.0 | 9.000 | Single Line | 20.1 |
| 8.242000 | --- | 31.51 | 74.00 | 42.49 | 1000.0 | 9.000 | Single Line | 19.5 |
| 8.242000 | 36.13 | --- | 87.00 | 50.87 | 1000.0 | 9.000 | Single Line | 19.5 |
| 8.338000 | --- | 31.57 | 74.00 | 42.43 | 1000.0 | 9.000 | Single Line | 19.5 |
| 8.338000 | 36.17 | --- | 87.00 | 50.83 | 1000.0 | 9.000 | Single Line | 19.5 |

♦ 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 ㎓)

■ DC Mode




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 133.305 | V | 57.1 | -24.9 | 32.2 | 40.0 | 7.8 | 104.0 | 15.0 | |
| 2 | 314.695 | V | 56.7 | -16.7 | 40.0 | 47.0 | 7.0 | 128.0 | 124.0 | |
| 3 | 315.423 | H | 55.3 | -16.7 | 38.6 | 47.0 | 8.4 | 390.0 | 150.0 | |
| 4 | 374.956 | V | 57.9 | -14.0 | 43.9 | 47.0 | 3.1 | 139.0 | 128.0 | |
| 5 | 374.956 | H | 55.1 | -14.0 | 41.1 | 47.0 | 5.9 | 366.0 | 70.0 | |
| 6 | 407.936 | H | 51.4 | -13.4 | 38.0 | 47.0 | 9.0 | 382.0 | 92.0 | |

■ PoE Mode


Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 186.655 | H | 52.6 | -22.5 | 30.1 | 40.0 | 9.9 | 390.0 | 312.0 | |
| 2 | 224.970 | V | 52.8 | -19.4 | 33.4 | 40.0 | 6.6 | 111.0 | 30.0 | |
| 3 | 311.058 | V | 56.4 | -16.9 | 39.5 | 47.0 | 7.5 | 138.0 | 216.0 | |
| 4 | 323.789 | H | 52.8 | -16.2 | 36.6 | 47.0 | 10.4 | 359.0 | 330.0 | |
| 5 | 374.956 | H | 58.4 | -14.0 | 44.4 | 47.0 | 2.6 | 354.0 | 65.0 | |
| 6 | 374.956 | V | 55.6 | -14.0 | 41.6 | 47.0 | 5.4 | 105.0 | 60.0 | |

♦ Calculation

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

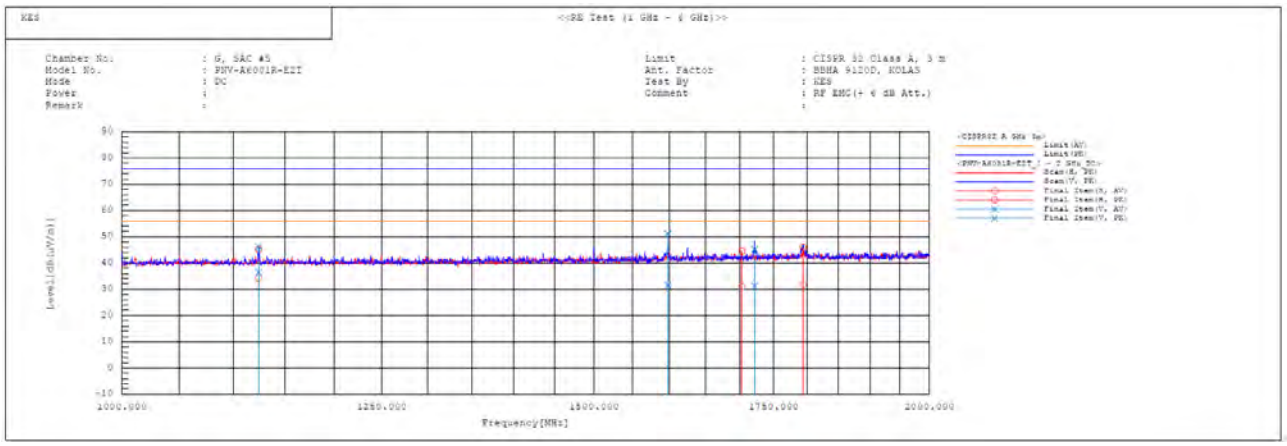
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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 ㎓)

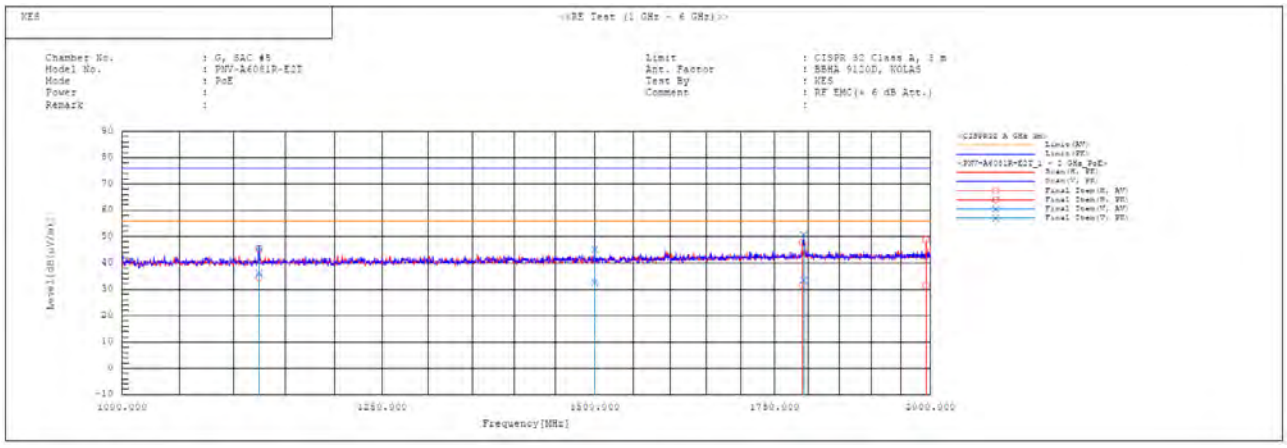
■ DC Mode




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 | 1124.500 | V | 38.4 | 48.2 | -1.9 | 36.5 | 46.3 | 56.0 | 76.0 | 19.5 | 29.7 | 100.0 | 236.8 | |
| 2 | 1124.500 | H | 36.2 | 47.1 | -1.9 | 34.3 | 45.2 | 56.0 | 76.0 | 21.7 | 30.8 | 100.0 | 187.8 | |
| 3 | 1598.000 | V | 31.3 | 51.0 | 0.3 | 31.6 | 51.3 | 56.0 | 76.0 | 24.4 | 24.7 | 100.0 | 160.3 | |
| 4 | 1702.500 | H | 30.3 | 43.7 | 0.8 | 31.1 | 44.5 | 56.0 | 76.0 | 24.9 | 31.5 | 100.0 | 197.7 | |
| 5 | 1721.000 | V | 30.4 | 44.3 | 0.9 | 31.3 | 45.2 | 56.0 | 76.0 | 24.7 | 30.8 | 100.0 | 1.1 | |
| 6 | 1794.500 | H | 30.6 | 44.8 | 1.2 | 31.8 | 46.0 | 56.0 | 76.0 | 24.2 | 30.0 | 100.0 | 304.3 | |

## ■ PoE Mode




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 | 1124.500 | H | 36.4 | 47.2 | -1.9 | 34.5 | 45.3 | 56.0 | 76.0 | 21.5 | 30.7 | 100.0 | 334.7 | |
| 2 | 1124.500 | V | 37.9 | 47.8 | -1.9 | 36.0 | 45.9 | 56.0 | 76.0 | 20.0 | 30.1 | 100.0 | 83.2 | |
| 3 | 1499.500 | V | 32.8 | 45.2 | -0.1 | 32.7 | 45.1 | 56.0 | 76.0 | 23.3 | 30.9 | 100.0 | 146.8 | |
| 4 | 1791.500 | H | 30.3 | 46.6 | 1.2 | 31.5 | 47.8 | 56.0 | 76.0 | 24.5 | 28.2 | 100.0 | 271.6 | |
| 5 | 1793.500 | V | 32.3 | 49.6 | 1.2 | 33.5 | 50.8 | 56.0 | 76.0 | 22.5 | 25.2 | 100.0 | 18.4 | |
| 6 | 1992.000 | H | 29.5 | 46.9 | 1.9 | 31.4 | 48.8 | 56.0 | 76.0 | 24.6 | 27.2 | 100.0 | 157.3 | |

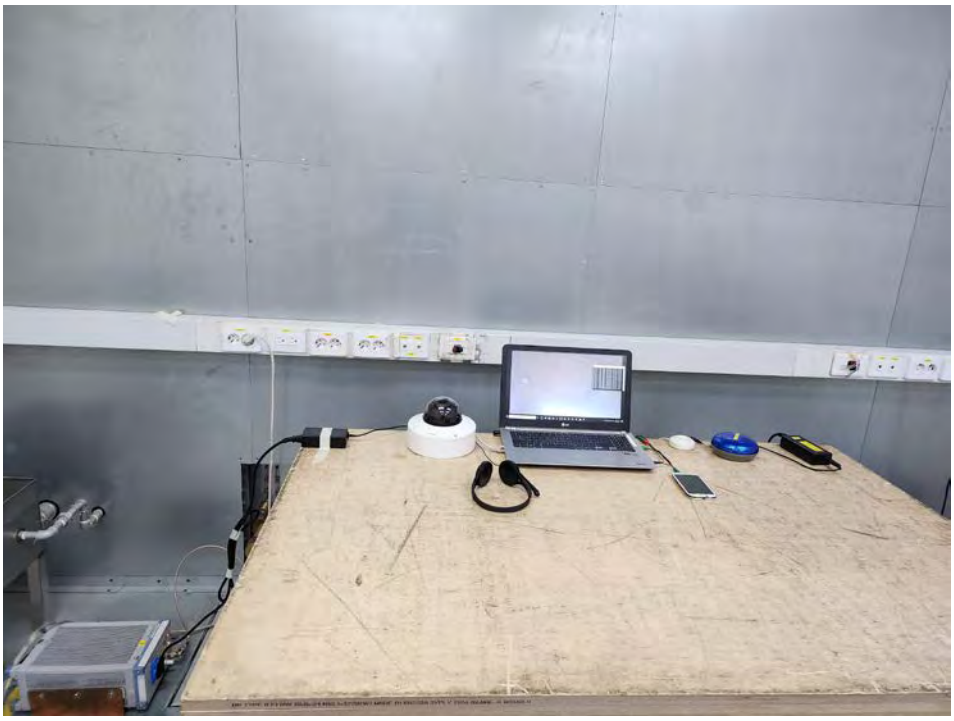
♦ Calculation

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

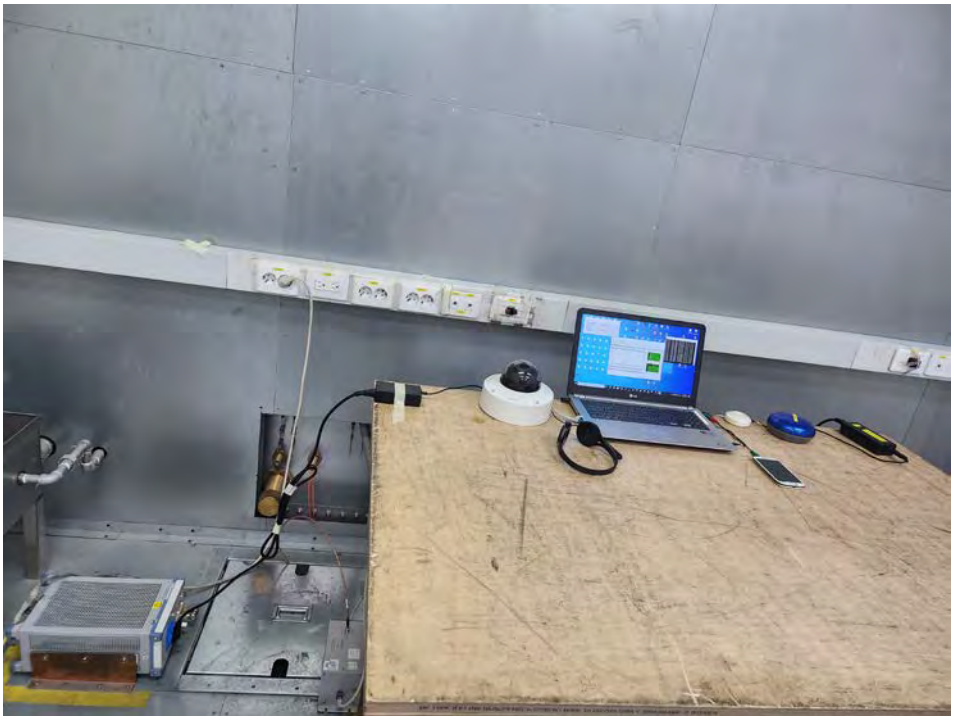
## Conducted Emissions at Mains Power Ports

■ DC Mode

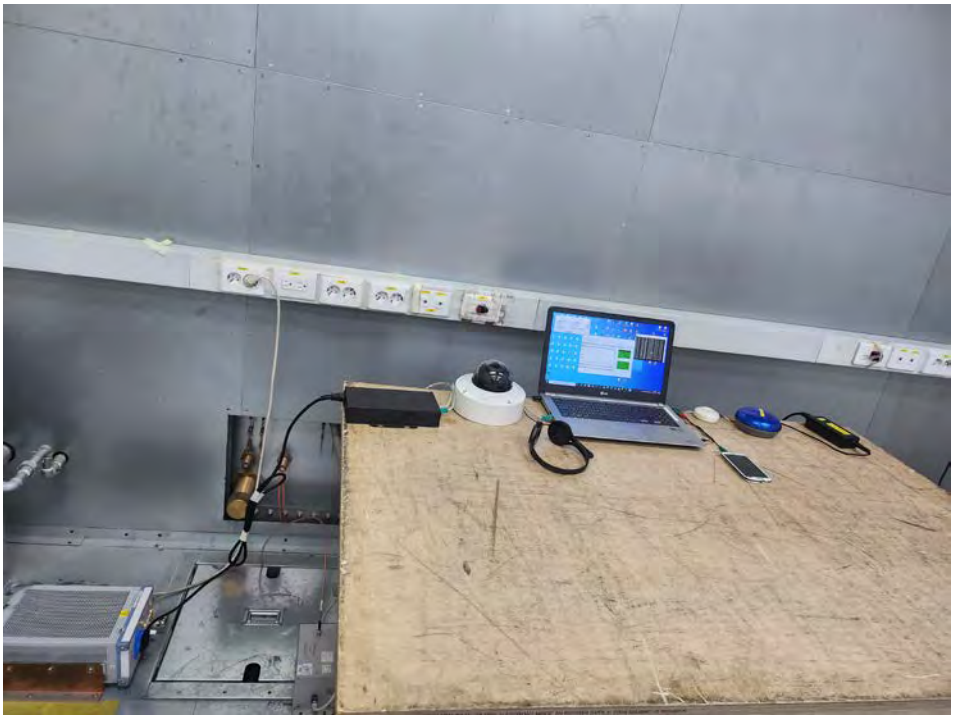


## Conducted Emissions at Telecommunication Ports

■ DC Mode

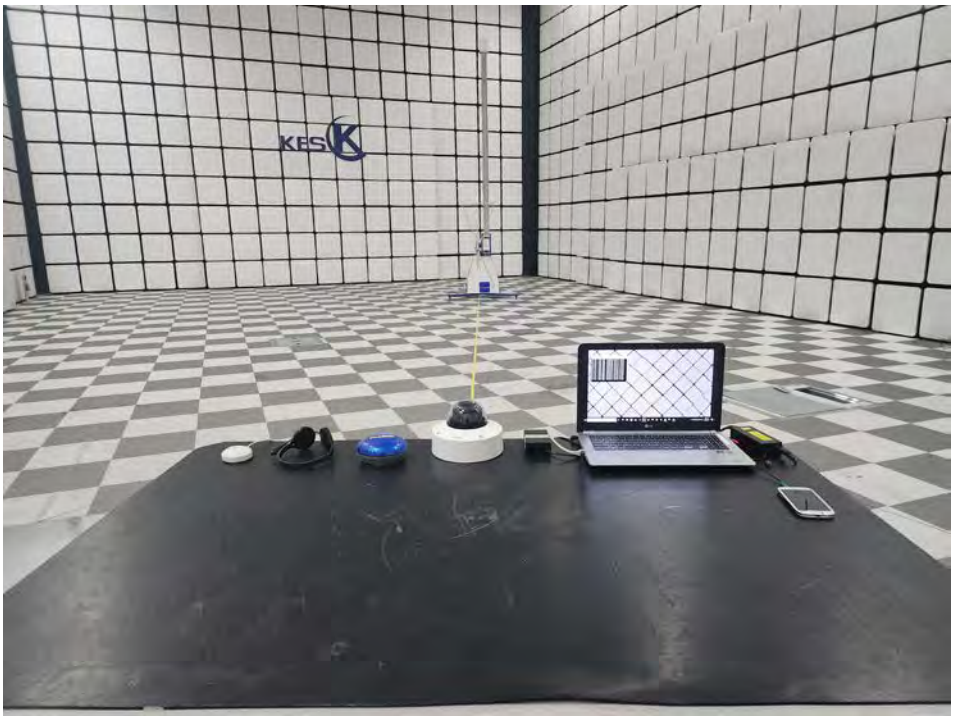


■ PoE Mode

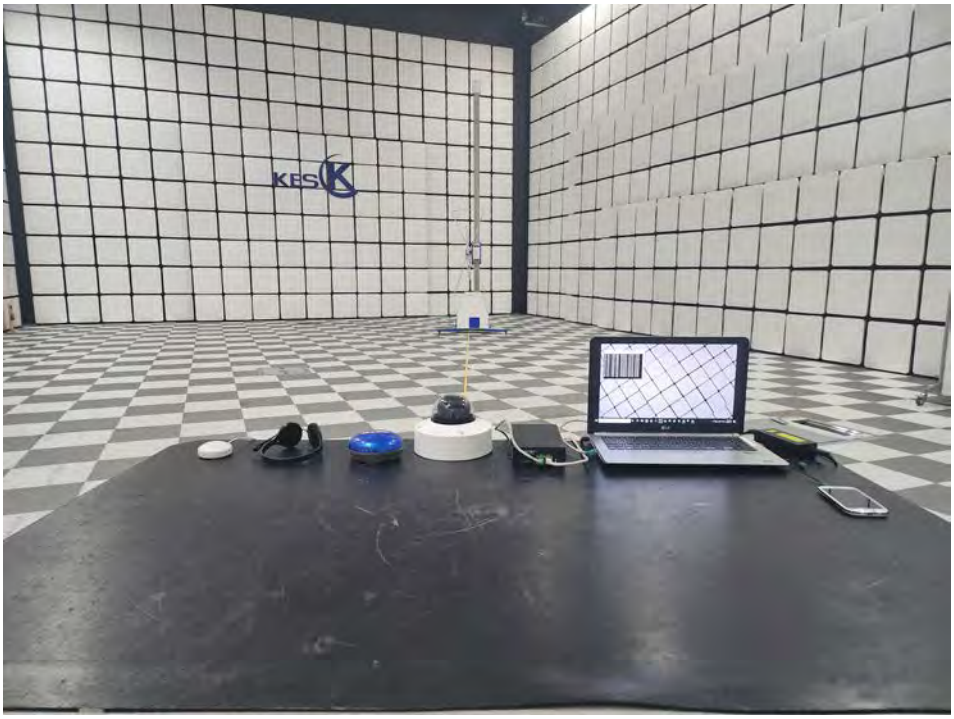


## Radiated Electric Field Emissions(Below 1 ㎓)

■ DC Mode

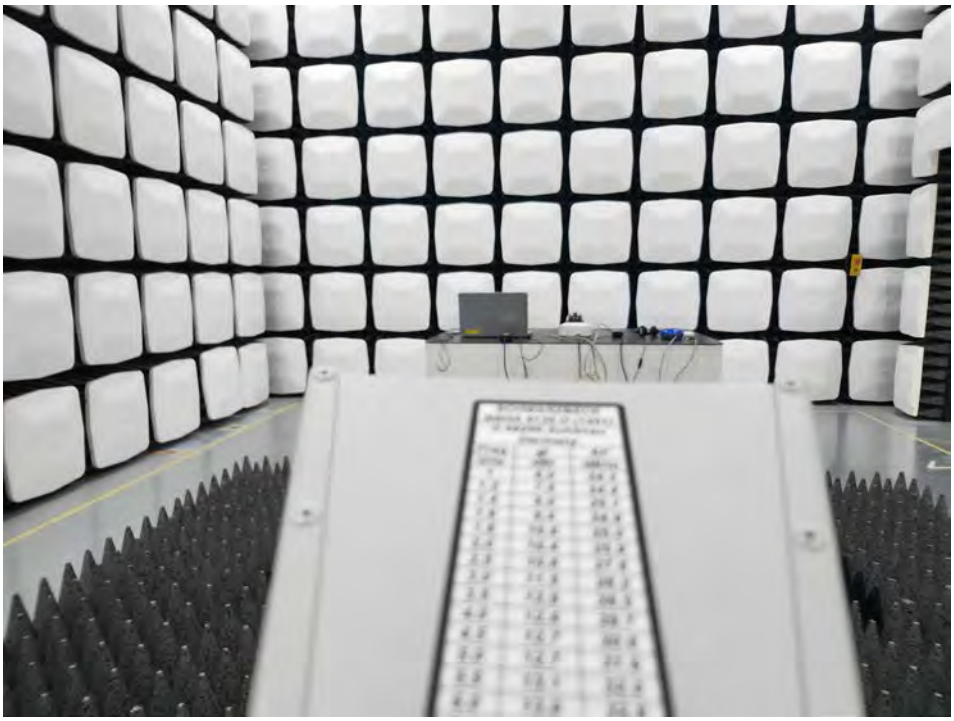


■ PoE Mode

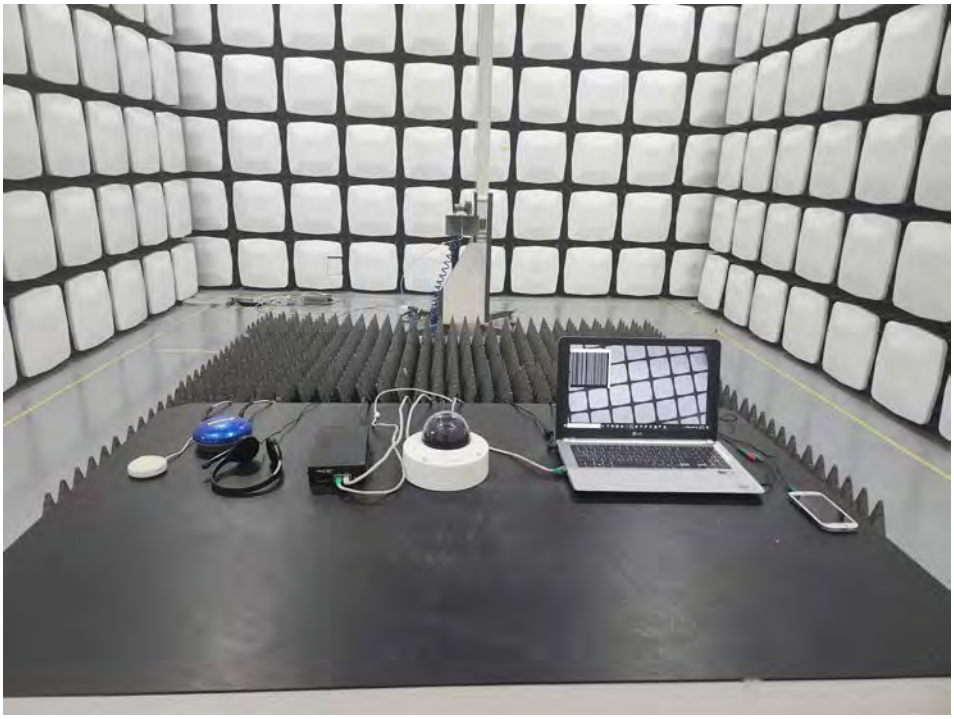


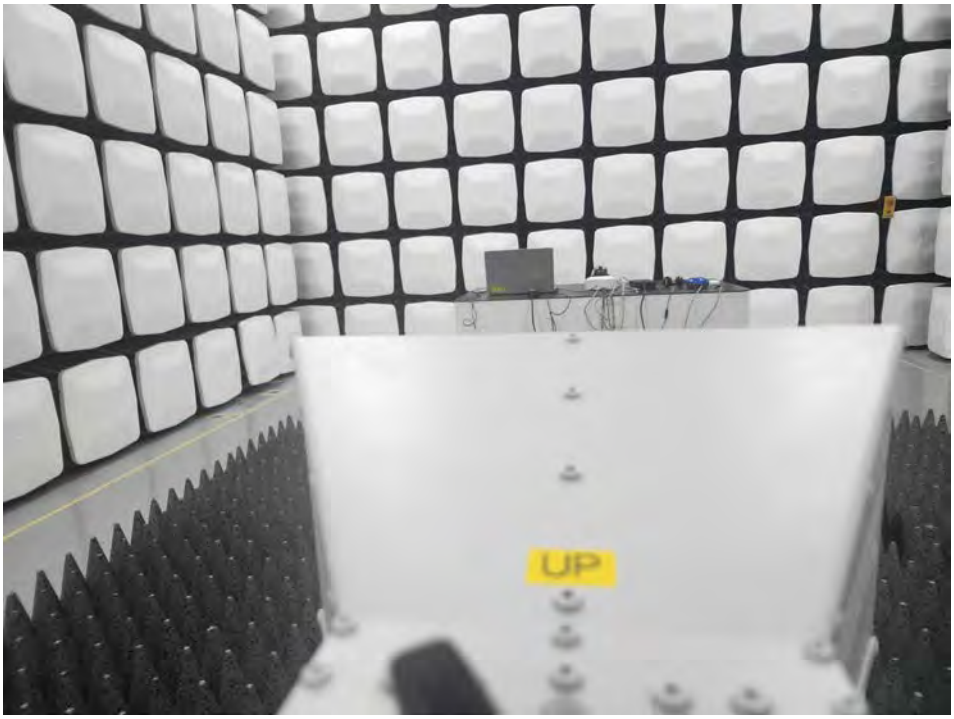
## Radiated Electric Field Emissions(Above 1 ㎓)

■ DC Mode



■ PoE Mode





# EUT External Photographs

(Top)

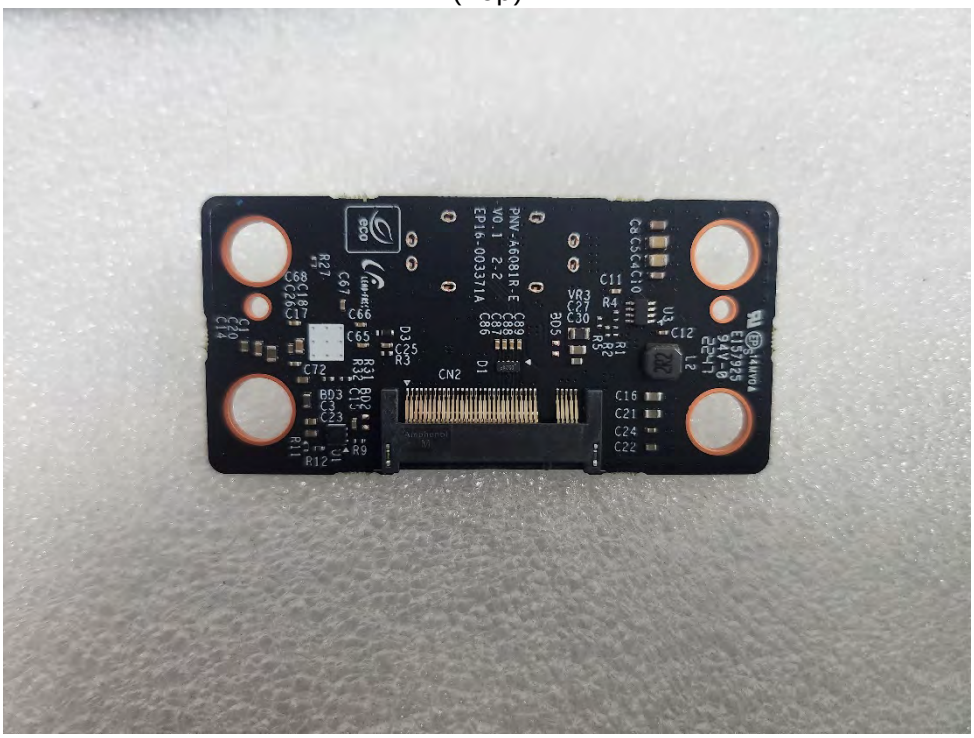
(Bottom)

# EUT Internal Photographs

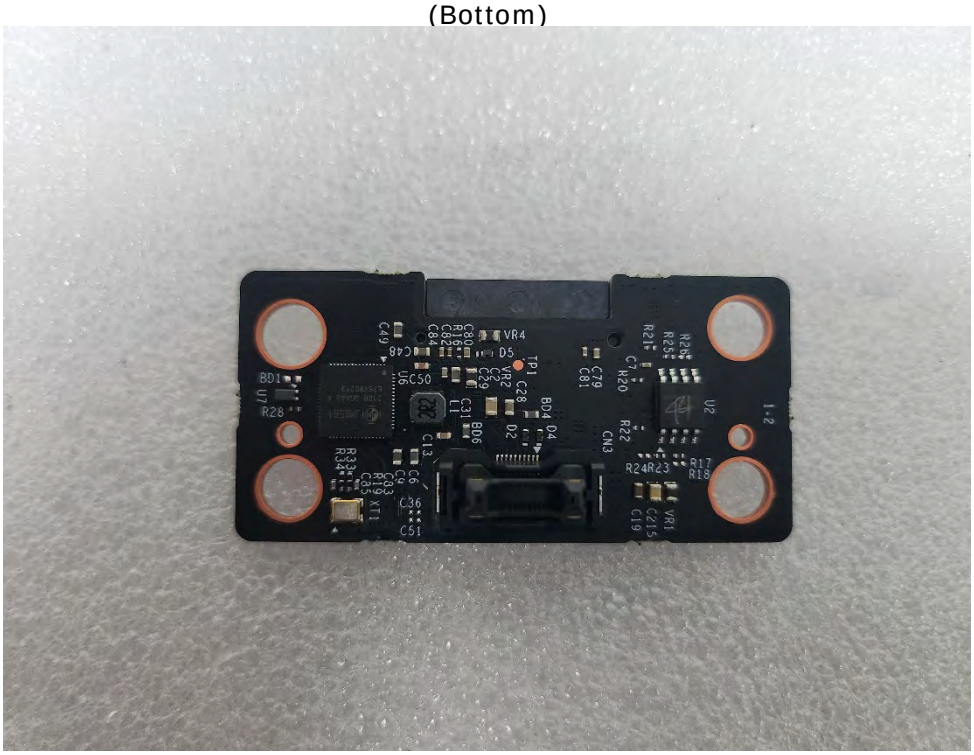
(Internal View)

# EUT Internal View – Board 1

(Top)

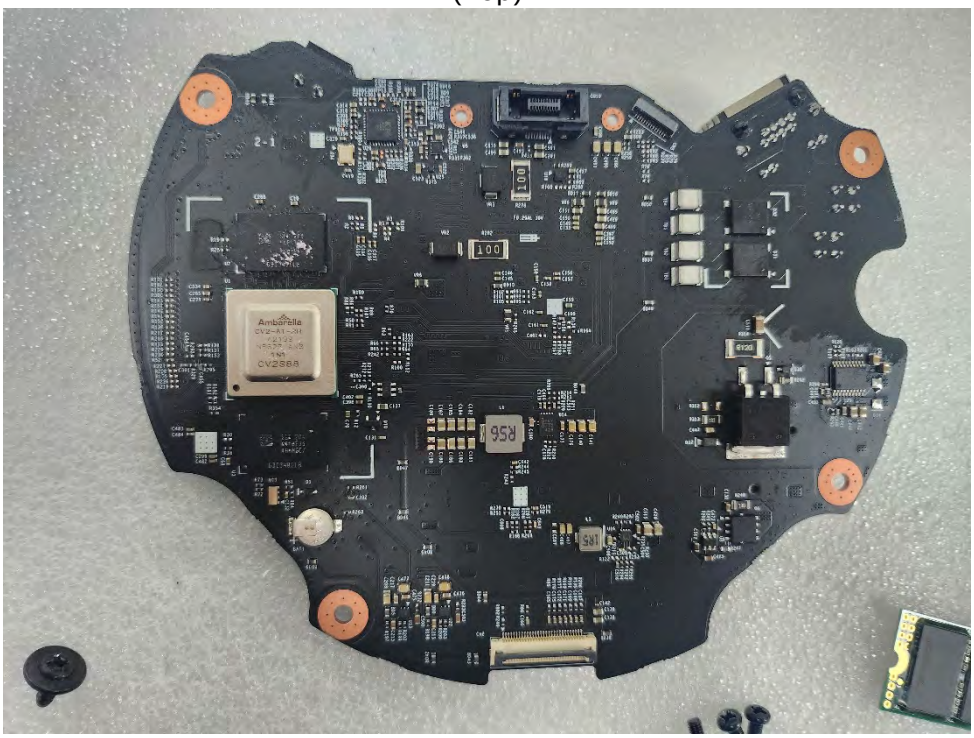


(Bottom)

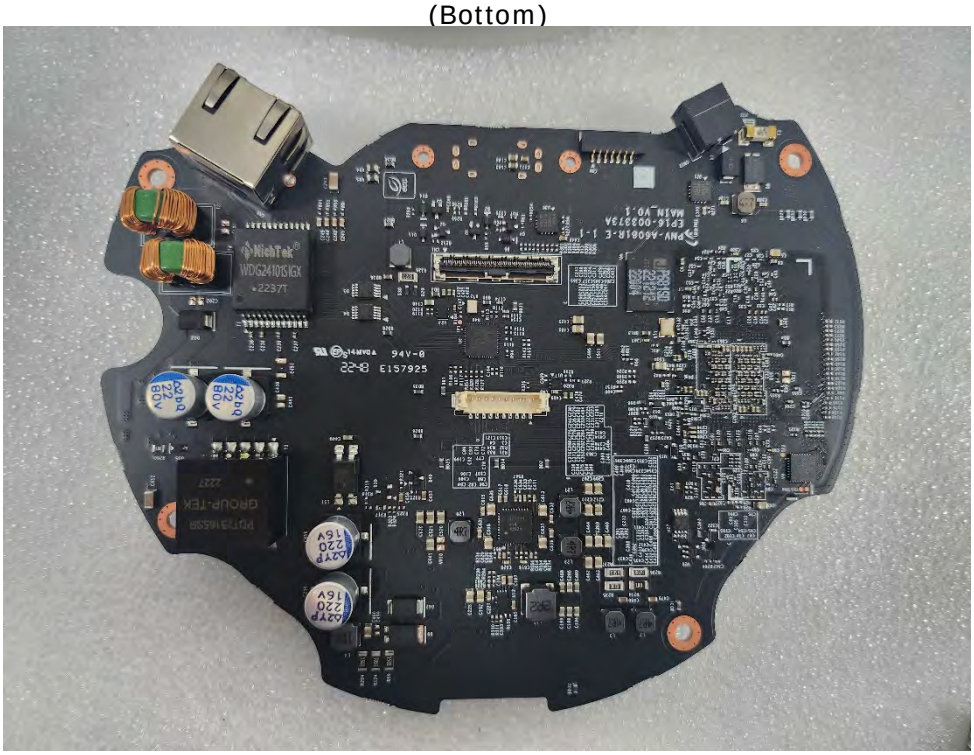


# EUT Internal View – Board 2

(Top)

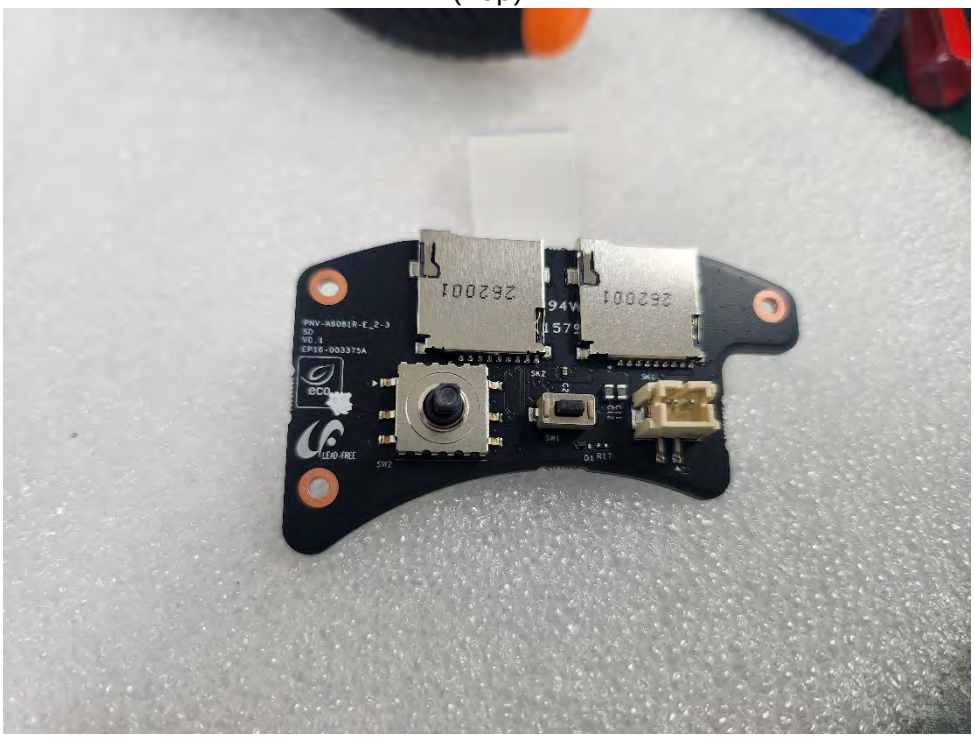


(Bottom)

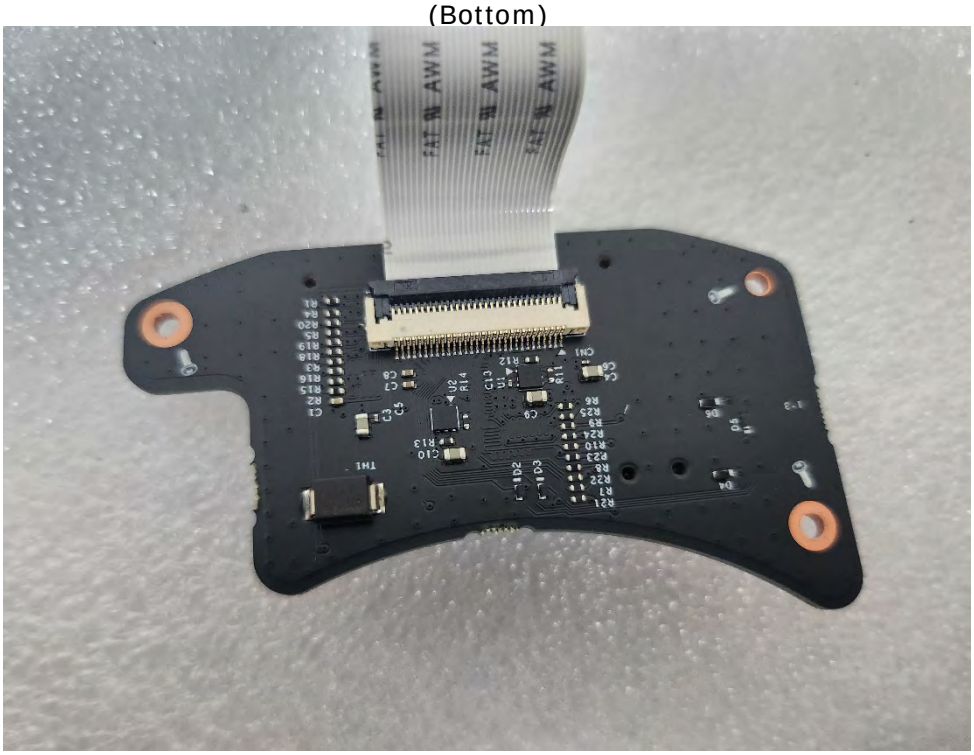


# EUT Internal View – Board 3

(Top)



(Bottom)



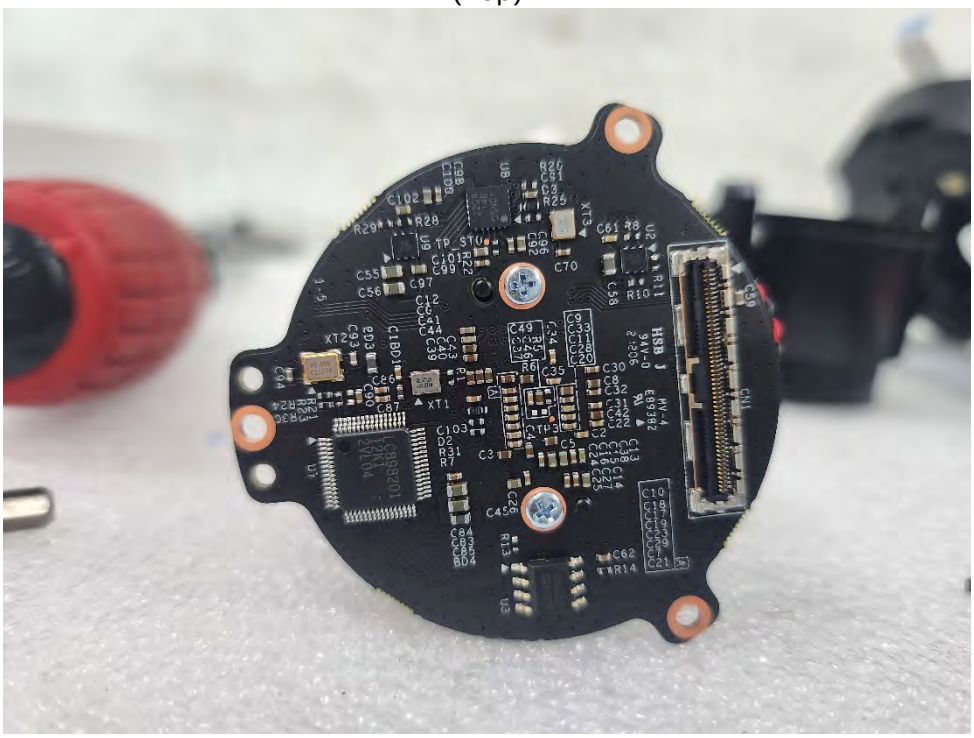
# EUT Internal View – Board 4

(Top)

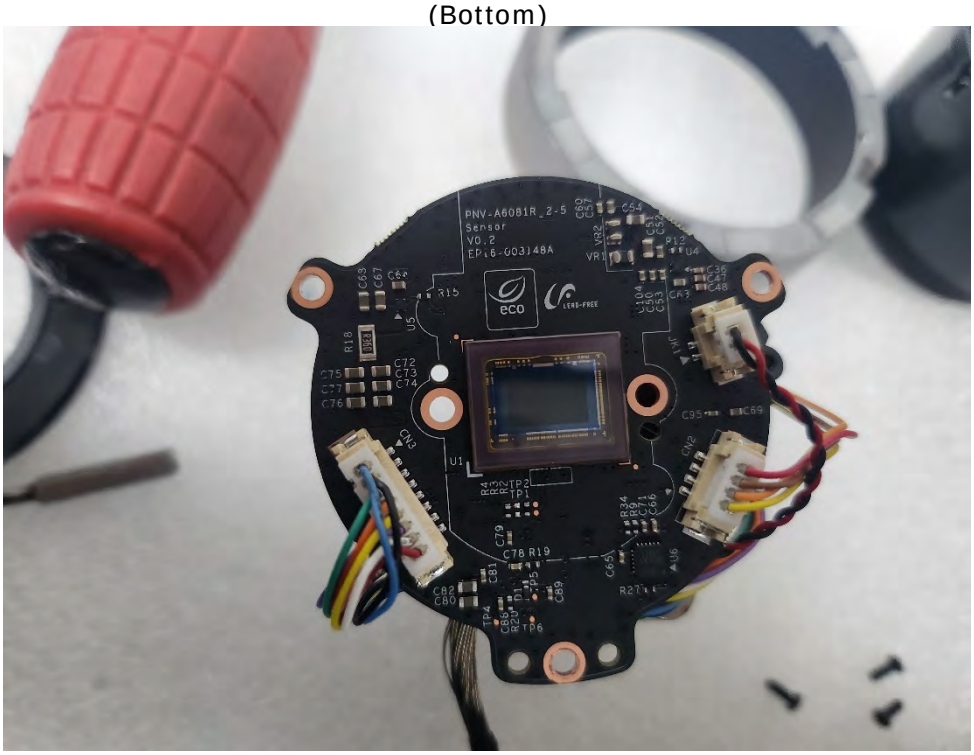

(Bottom)

# EUT Internal View – Board 5

(Top)

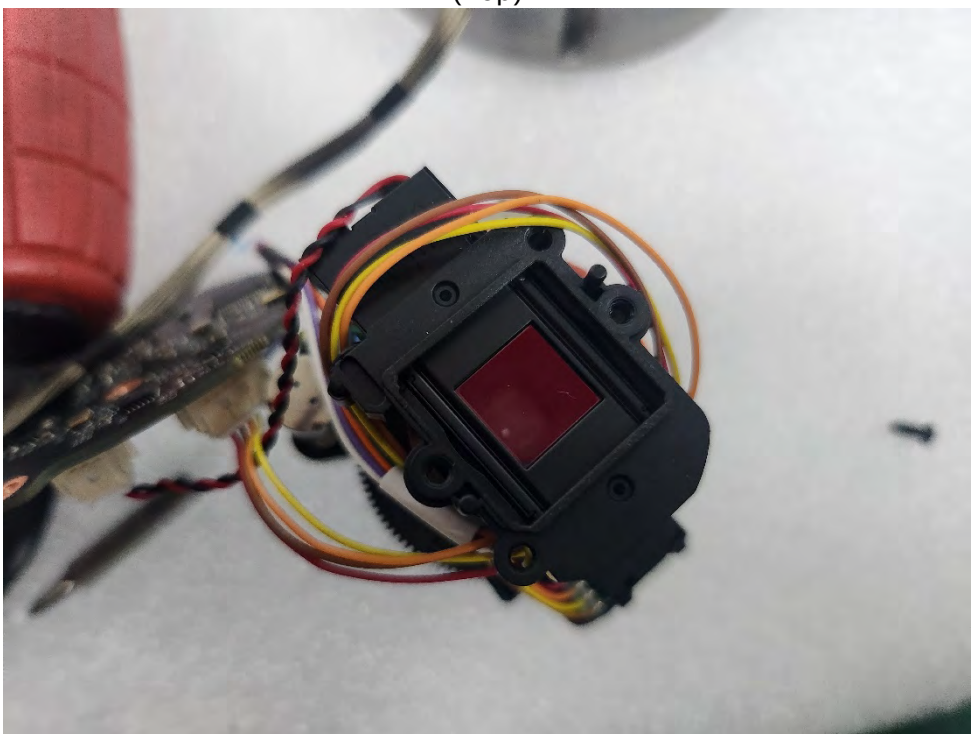


(Bottom)



# EUT Internal View – Lens

(Top)



(Bottom)

# EUT Internal View – SSD

(Top)


(Bottom)