



# TEST REPORT



Report No. : KES-EM242535

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**KES Co., Ltd.**

#3002, #3503, #3701, 40, Simin-daero365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Republic of Korea

Tel : +82-31-425-6200, Fax : +82-31-381-3838

## 1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

## 2. Sample Description

Product name : NETWORK CAMERA

Model/Type No. : QNV-C8023R

Variant Model : QNV-C8013R

Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED  
2. D-TECH CO.,LTD.

Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended Area, Nam Son Ward, Bac Ninh City, Bac Ninh Province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex).

3. Date of Receipt : Jul. 24, 2024

4. Test date : Jul. 31, 2024 ~ Aug. 03, 2024

5. Date of Issue : Aug. 08, 2024

6. Test Results : In Compliance

*Tested by*

*Reviewed by*

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Se Heon, Kim  
EMC Test Engineer

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Seong Min, Choi  
EMC Technical Manager

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



### REPORT REVISION HISTORY

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| Aug. 08, 2024 | KES-EM242535    | Issued           |
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## 1.0 General Product Description

Main Specifications of EUT are:

Highest internal Frequency : 1 866 MHz

| QNV-C8013R                  |   |
|-----------------------------|---|
| <b>Video</b>                |   |
| Imaging Device              | 1/2.8" CMOS   |
| Resolution                  | 2592x1944, 2560x1440, 1920x1080, 1280x960, 1280x720, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240  |
| Max. Framerate              | H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) (WDR on/off)<br>MJPEG: Max. 30fps(@5MP Max. 5fps)  |
| NETD                        | None  |
| Pixel Size                  | None  |
| Min. Illumination           | Color: 0.03Lux(F1.6, 1/30sec, 30IRE)<br>BW: 0.003Lux(F1.6, 1/30sec, 30IRE), 0Lux(IR LED on)   |
| Video Out                   | USB: Micro USB Type B, 1280x720 for installation  |
| Video Transmission Distance | None  |
| <b>Lens</b>                 |   |
| Focal Length (Zoom Ratio)   | 3.0mm fixed focal   |
| Optical Zoom                | None  |
| Max. Aperture Ratio         | F1.6  |
| Angular Field of View       | H: 100°/ V: 73°/ D: 129°  |
| Min. Object Distance        | 0.5m (1.64ft)   |
| Focus Control               | Fixed   |
| Lens Type                   | Fixed IRIS  |
| Mount Type                  | M12   |
| Optional Lens               | None  |
| <b>Pan / Tilt / Rotate</b>  |   |
| Pan / Tilt / Rotate Range   | 0°~350° / 0°~70° / 0°~355°  |
| Pan Range                   | None  |
| Pan Speed                   | None  |
| Tilt Range                  | None  |
| Tilt Speed                  | None  |
| Rotate Range                | None  |
| Sequence                    | None  |
| Preset Accuracy             | None  |
| <b>Operational</b>          |   |
| Camera Title                | Displayed up to 85 characters   |
| Direction Indicator         | None  |
| Day & Night                 | Auto(ICR)   |
| Backlight Compensation      | BLC, WDR, SDR   |
| Wide Dynamic Range          | 120dB   |
| Digital Noise Reduction     | WiseNR II (Based on AI engine)<br>SSNRV   |
| Digital Image Stabilization | None  |
| Defog                       | None  |
| Motion Detection            | 8ea, 8point polygonal zones<br>32ea, 4point quadrangle zones  |
| Privacy Masking             | - Color: Gray/Green/Red/Blue/Black/White<br>Dynamic Privacy Mask<br>- Mosaic  |
| Gain Control                | Low / Middle / High   |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor   |
| LDC                         | Support   |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker (1/5~1/25,000sec)<br>Prefer shutter control(Based on AI engine)  |
| Video Rotation              | Flip, Mirror, Hallway view(90°/270°)  |
| Analytics                   | Classified object type: Person/Vehicle(Type:car/bus/truck/motorcycle/bicycle)<br>Attributes: Person(Upper/lower clothes color),<br>Vehicle(Type:car/bus/truck/motorcycle/bicycle and color)<br>Support DetectionShot<br>Analytics events based on AI engine<br>- Motion detection*, Object detection, Virtual line*(Crossing/Direction),<br>Virtual area*(Loitering/Intrusion/Enter/Exit)<br>Analytics events<br>- Defocus detection, Tampering, Virtual area(Appear/Disappear)<br><br>* Some of the video analytics only works with people and vehicle detection |
| Business Intelligence       | Based on AI engine: People counting, Vehicle counting, Queue management, Heatmap  |
| Serial Interface            | None  |
| Alarm I/O                   | Input 1ea / Output 1ea<br>* Alarm I/O is supported through an optional cable(SPP-C7400)   |
| Alarm Triggers              | Analytics, Network disconnect, Alarm input  |
| Alarm Events                | When alarm trigger occurred<br>- File upload(image) : e-mail/FTP<br>- Notification : e-mail<br>- Recording : SD/SDHC/SDXC or NAS recording at event triggers<br>- Alarm output<br>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)<br>- MQTT: publication   |
| Audio Streaming             | None  |
| Audio In                    | Selectable(mic in/line in)<br>* Audio In is supported through an optional cable(SPP-C7400)  |
| Audio Out                   | Line out<br>* Audio Out is supported through an optional cable(SPP-C7400) (TBD)   |
| Light Type                  | IR LED (850nm)  |
| Light Viewable Length       | 20m(65.62ft)→25m(TBD)   |
| IR Viewable Length          | None  |
| IR Illuminator (Optional)   | None  |
| IR Radiation angle          | None  |
| IR LED                      | None  |



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|                                       |  |
|---------------------------------------|--|
| IR Wavelength                         | long-life 850 nm IR LED  |
| IR Operation                          | None   |
| Water Removal                         | None   |
| Auto Tracking                         | None   |
| Coaxial Protocol                      | None   |
| Color Palettes                        | None   |
| <b>Radiometry</b>                     |  |
| Temperature Detect Range              | None   |
| Temperature Accuracy                  | None   |
| Temperature Detection                 | None   |
| Additional                            | None   |
| <b>Network</b>                        |  |
| Ethernet                              | RJ-45(10/100BASE-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(Sea area), WiseStreamIII(Based on AI engine)  |
| Bitrate Control                       | H.264/H.265: CBR or VBR<br>MJPEG: VBR  |
| Streaming                             | Unicast(20 users) / Multicast<br>Multiple streaming(Up to 5 profiles)  |
| Protocol                              | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP (TCP, UDP Unicast) |
| SIP support (VoIP, Peer-to-peer)      | None   |
| Security                              | None   |
| Application Programming Inter         | ONVIF Profile S/G/T/M<br>SUNAPI(HTTP API)  |
| <b>Security</b>                       |  |
| OS / Firmware Protect                 | Secure boot, Signed firmware, Firmware encryption  |
| User authentication                   | Digest Authentication, Prevent brute-force attack  |
| Network authentication                | 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)  |
| Secure Communication                  | HTTPS, SRTP, WSS(Websocket secure)   |
| Access Control                        | Access control based on IP address   |
| Data Protect                          | Authentication information encryption, ZIP compression encryption  |
| Audit                                 | User Access/System/Event log management  |
| Device ID                             | Device Certificate(Hanwha Private Root CA)   |
| Secure Storage                        | SDcard partition encrypt   |
| Security Certificate                  | None   |
| <b>General</b>                        |  |
| Webpage Language                      | English, Korean, Simplified Chinese, Traditional Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek                                       |
| Web Viewer                            | None   |
| Edge Storage                          | Micro SD/SDHC/SDXC 1slot 256GB   |
| Memory                                | 2GB RAM, 1GB Flash   |
| <b>Environmental &amp; Electrical</b> |  |
| Operating Temperature / Hum           | -30°C~+55°C(-22°F~+131°F) / 0~100% RH<br>* Start up should be done at above -30°C<br>Humidity control /w Air vent  |
| Storage Temperature / Humid           | -50°C~+60°C(-58°F~+140°F) / 0~95% RH   |
| Wind Load                             | None   |
| EPA(Effective Projected Area)         | None   |
| Certification                         | IP66, IK10   |
| Input Voltage                         | PoE(IEEE802.3af, Class3)   |
| Power Consumption                     | PoE: Max 8.1W,<br>typical 4.0W   |
| <b>Mechanical</b>                     |  |
| Color / Material                      | White / Aluminum<br>Bubble : Hard-coated dome  |
| RAL Code                              | RAL9003  |
| Product Dimensions / Weight           | ø120x97.5mm(ø4.72x3.84"), 579.0g(1.27 lb)  |
| Compatible Conduit hole / Gar         | SBD-110GP1 : Single, Double, 4" Octagon (Sold separately)  |
| Hanging Mount (Dome)                  | None   |
| Skin Cover                            | None   |
| Skin Cover (Dome)                     | None   |
| Weather Cap (Dome)                    | None   |
| Power Module                          | None   |
| Backbox                               | None   |
| Ceiling Mount (Assy)                  | None   |
| Wall Mount                            | None   |
| Pole Mount                            | None   |
| In-ceiling Mount                      | None   |
| Parapet Mount                         | None   |
| Corner Mount                          | None   |
| Tilt Mount                            | None   |
| Housing (Box)                         | None   |
| Cabinet                               | None   |
| Gang Plate                            | None   |
| Conduit Adaptor                       | None   |
| Other Compatible Models               | None   |

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



| 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, IEC/EN 62262 IK10  |
| Video                         | None  |
| Compatible Models             |   |
| Hanging Adaptor               | SBP-120HMMW   |
| Back Box                      | SBV-140BW   |
| Ceiling Mount (Assy)          | SBP-300CMW1/900CMW, SBP-150CMI/300CMI, SBP-300CMTW, SBP-300CM   |
| Ceiling Mount (Single Unit)   | None  |
| Wall Mount                    | SBP-125WMW1, SBP-300WMW/WMW1, SBP-390WMW2   |
| Wall Mount Adaptor            | None  |
| Pole Mount                    | SBD-140PMW, SBP-300PMW2, SBD-140PMB   |
| In-ceiling Mount              | SHD-1200FPW   |
| Corner Mount                  | SBP-300KMW1, SBD-140KMB   |
| Parapet Mount                 | SBP-300LMW, SBP-156LMW1   |
| Tilt Mount                    | SBV-140TMW  |
| Cabinet                       | SBP-300NBW  |
| Housing                       | None  |
| Gang Plate                    | SBD-110GP1  |
| Skin Cover                    | None  |
| Weather Cap                   | None  |
| Dome Cover                    | None  |
| Conduit Adaptor               | None  |
| Power Module                  | None  |
| Interface Box                 | None  |
| Other Compatible Models       | SPP-C7400 (Audio/Alarm Cable)   |
| DORI (EN62676-4 standard)     |   |
| Detect (25PPM/ 8PPF)          | 43.5m(142.71ft)   |
| Observe (63PPM/ 19PPF)        | 17.5m(57.09ft)  |
| Recognize (125PPM/ 38PPF)     | 8.7m(28.54ft)   |
| Identify (250PPM/ 76PPF)      | 4.3m(14.27ft)   |
| LPR/ANPR/MMCR                 |   |
| Speed Description             | None  |
| Speed limit                   | None  |
| Min. Forward Distance         | None  |
| Max. Forward Distance         | None  |
| Max. Horizontal Angle         | None  |
| Max. Vertical Angle           | None  |
| Horizontal Offset             | None  |
| Camera Height                 | None  |
| Lane Coverage                 | None  |
| Vehicle Recognition           | None  |
| Available Countries           | None  |
| Wisenet Road AI LPR/ANPR/MMCR |   |
| Solution                      | None  |
| Speed Description             | None  |
| Lane Coverage                 | None  |
| Speed limit                   | None  |
| Min. Forward Distance         | None  |
| Max. Forward Distance         | None  |
| Max. Horizontal Angle         | None  |
| Max. Vertical Angle           | None  |
| Horizontal Offset             | None  |
| Camera Height                 | None  |
| Vehicle Recognition           | None  |
| Available Countries           | None  |
| Ver                           |   |
| Ver                           | 202407  |



## 1.1 Test Voltage & Frequency

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

AC 230 V, 50 Hz (PoE Adapter Input power)

## 1.2 Variant Model Differences

Addition of a simple derivative model due to the difference in fixed lenses  
(No electronics in the lens, same as the base model, no changes in circuitry, appearance, or hardware.)

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

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

## 1.5 Support Equipments

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



## 1.6 External I/O Cabling

| Start                |                   | END            |                   | Cable Spec. |        |
|----------------------|-------------------|----------------|-------------------|-------------|--------|
| Description          | I/O Port          | Description    | I/O Port          | Length      | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (PoE)       | PoE Injector   | RJ-45 (PoE)       | 3.5         | U      |
|                      | 7 Pin (Audio OUT) | Headset        | 7 Pin (Audio IN)  | 2.0         | U      |
|                      | 7 Pin (Audio IN)  |                | 7 Pin (Audio OUT) | 2.0         | U      |
|                      | 7 Pin (Alarm OUT) | Alarm          | 7 Pin (Alarm IN)  | 3.5         | U      |
|                      | 7 Pin (Alarm IN)  | Button Alarm   | 7 Pin (Alarm OUT) | 3.5         | U      |
|                      | Micro SD Slot     | Micor SD Card  | Micro SD Slot     | -           | -      |
| PoE Injector         | RJ-45 (LAN)       | Laptop         | RJ-45 (LAN)       | 2.0         | U      |
| Laptop               | DC Jack           | Laptop Adapter | DC Jack           | 1.5         | U      |
|                      | 3.5 mm            | Smartphone     | 3.5 mm            | 1.2         | U      |

\* Unshielded = U, Shielded = S

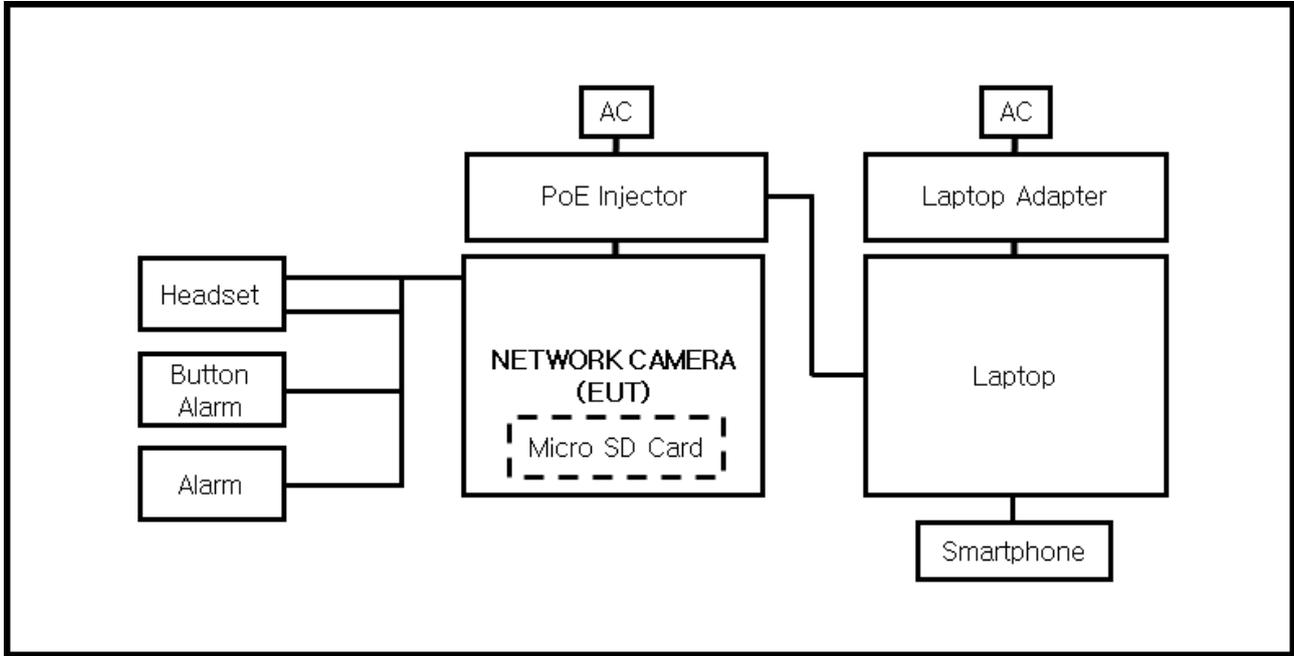
## 1.7 EUT Operating Mode(s)

| Test mode | Normal operating   | Test Voltages   |
|-----------|--|-----------------|
| Operating | <ul style="list-style-type: none"> <li>- Monitoring EUT Using Web Viewer, Ping Test</li> <li>- Check Audio Port Behavior Through Headset</li> <li>- When the Button Alarm is pressed, make sure the Alarm is working</li> <li>- Check the files stored on the Micro SD Card after testing</li> </ul> | AC 230 V, 50 Hz |

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



## 1.8 Configuration





### 1.9 Remarks when standards applied

- PoE port is considered to be wired network port, so power-related test items are excluded.
- The USB port was excluded from the test as a port for administrators.

### 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 0008                     |



## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

**EMC – Directive 2014/30/EU**

EN 55032:2015/A11:2020

Class A

Class B

EN 50130-4:2011/A1:2014

**EMC –Regulations 2016**

EN 55032:2015/A11:2020

Class A

Class B

EN 50130-4:2011/A1:2014





## 2.1 Conducted Emissions at Mains Power Ports

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                     | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101783        | 11, 08, 2024 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 08, 2024 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 01, 10, 2025 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 08, 2024 |

**Test Conditions**

Temperature: °C

Relative Humidity: % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

**Remarks**

Refer to 'Remarks when standards applied'.



## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**

Jul. 31, 2024

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101783        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 11, 09, 2024 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101666        | 03, 06, 2025 |
| <input type="checkbox"/>            | ISN               | ISN S8       | SCHWARZBECK  | ISN-S8-0019   | 03, 05, 2025 |

**Test Conditions**

Temperature: (25,2 ± 0,0) °C

Relative Humidity: (50,2 ± 0,0) % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- PASS  
 NOT PASS  
 NOT APPLICABLE

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



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

**Test Date**

Jul. 31, 2024

**Test Location**

OPEN AREA TEST SITE #2       SEMI ANECHOIC CHAMBER #4(10 m)

**Test Equipment**

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 17, 2024 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 02, 13, 2025 |

**Test Conditions**

Temperature: (24,1 ± 0,1) °C  
 Relative Humidity: (46,7 ± 0,0) % R.H.

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

**Remarks**

See Appendix A for test data.



## 2.4 Radiated Electric Field Emissions(Above 1 GHz)

**Test Date**

Jul. 31, 2024

**Test Location**

SEMI ANECHOIC CHAMBER #5

**Test Equipment**

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

**Test Conditions**

Temperature: (24,0 ± 0,1) °C

Relative Humidity: (47,2 ± 0,0) % R.H.

**Frequency Range of Measurement**

1 GHz to 6 GHz

**Instrument Settings**

IF Band Width: 1 MHz

**Test Results**

The requirements are:

- PASS  
 NOT PASS  
 NOT APPLICABLE

**Remarks**- See Appendix A for test data.- The Average of the test data is the cispr average result.



## 2.5 Harmonic Current Emissions

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #7

**Test Equipment**

| Used                     | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W           | net.control  | EM TEST      | 2.1.4         | -            |
| <input type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 03, 28, 2025 |
| <input type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

**Test Conditions**

Temperature: °C

Relative Humidity: % R.H.

**Classification of Equipment for Harmonic Current Emissions**

- Class A
- Class B
- Class C(Below 25 W)
- Class C(Above 25 W)
- Class D

**Test Results**

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

**Remarks**

Refer to 'Remarks when standards applied'.



## 2.6 Voltage Fluctuations and Flicker

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #7

**Test Equipment**

| Used                     | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W           | net.control  | EM TEST      | 2.1.4         | -            |
| <input type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 03, 28, 2025 |
| <input type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

**Test Conditions**

Temperature:

°C

Relative Humidity:

% R.H.

**Test Results**

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

**Remarks**

Refer to 'Remarks when standards applied'.



### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

**The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.**

**If as a result of the application of the tests defined in this standard, the apparatus**

**becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.**

**A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:**

#### **Electrostatic discharge**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

#### **Radiated electromagnetic fields**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.



### **Fast transient burst / slow high energy voltage surge**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

### **Conducted RF immunity**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators oeuvres at  $U = 130 \text{ dB}\mu\text{V}$ .

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at  $U = 140 \text{ dB}\mu\text{V}$ , providing:

- (a) there is no permanent damage or change to the EUT  
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at  $U = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at  $U = 120 \text{ dB}\mu\text{V}$ .

### **Voltage dip/interruption / Voltage variation**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.



### 3.1 Electrostatic Discharge

**Reference Standard**

EN 61000-4-2

**Test Date**

Aug. 01, 2024

**Test Location**

EMS-ESD: SHIELD ROOM #6

**Test Equipment**

| Used                                | Description   | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | ESD SIMULATOR | ESS-2000     | Noise Ken    | ESS01Z0454    | 01, 30, 2025 |
| <input checked="" type="checkbox"/> | HCP           | -            | KES          | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | Noise Ken    | -             | -            |

**Test Conditions**

Temperature: (24,6 ± 0,0) °C  
 Relative Humidity: (48,8 ± 0,0) % R.H.  
 Atmospheric Pressure: (99,3 ± 0,0) kPa

**Test Specifications**

Discharge Factor: ≥ 1 s  
 Discharge Impedance: 330 ohm / 150 pF  
 Kind of Discharge: Air, Contact (direct and indirect)  
 Polarity: Positive and Negative  
 Number of Discharge: 10 at all locations for Air discharge  
 10 at all locations for Contact discharge

Discharge Voltage:

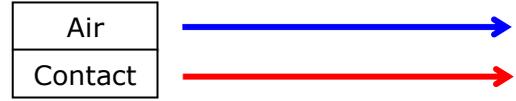
| Contact                                  | Air                                      | HCP                                      | VCP                                      |
|--|--|--|--|
| <input type="checkbox"/> 2 kV            | <input checked="" type="checkbox"/> 2 kV | <input type="checkbox"/> 2 kV            | <input type="checkbox"/> 2 kV            |
| <input type="checkbox"/> 4 kV            | <input checked="" type="checkbox"/> 4 kV | <input type="checkbox"/> 4 kV            | <input type="checkbox"/> 4 kV            |
| <input checked="" type="checkbox"/> 6 kV | <input type="checkbox"/> 6 kV            | <input checked="" type="checkbox"/> 6 kV | <input checked="" type="checkbox"/> 6 kV |
| <input type="checkbox"/> 8 kV            | <input checked="" type="checkbox"/> 8 kV | <input type="checkbox"/> 8 kV            | <input type="checkbox"/> 8 kV            |
| <input type="checkbox"/> 15 kV           |

Notes: HCP: Horizontal coupling plane  
 VCP: Vertical coupling plane

Required Performance Criteria:  Complied



**Location of Discharge:**



1



2



**Test Data**

Indirect Discharge

| No. | Test Point  | Discharge Method  | Observations | Remarks |
|-----|-------------|-------------------|--------------|---------|
| 1   | HCP Contact | Contact Discharge | Complied     | -       |
| 2   | VCP Contact | Contact Discharge | Complied     | -       |

Direct Discharge

| No. | Test Point  | Discharge Method  | Observations | Remarks |
|-----|-------------|-------------------|--------------|---------|
| 1   | Enclosure 1 | Air Discharge     | Complied     | -       |
| 2   | Enclosure 2 | Contact Discharge | Complied     | -       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.2 Radiated Electric Field Immunity

**Reference Standard**

EN IEC 61000-4-3

**Test Date**

Aug. 02, 2024

**Test Location**EMS-RS:  SEMI ANECHOIC CHAMBER #3  SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

| Used                                | Description                     | Model Number | Manufacturer    | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------------|--------------|-----------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W                    | EMC32        | R & S           | 10.10.02      | -            |
| <input checked="" type="checkbox"/> | SIGNAL GENERATOR                | SMB 100A     | Rohde & Schwarz | 108252        | 07, 29, 2025 |
| <input checked="" type="checkbox"/> | HIGH POWER DUAL AMP             | SSA532       | SUNGSAN         | SSA532-001    | -            |
| <input checked="" type="checkbox"/> | POWER METER                     | E4419B       | Agilent         | GB40203000    | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY52170007    | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY41498669    | 02, 13, 2025 |
| <input checked="" type="checkbox"/> | STACKED DOUBLE LOG-PER- ANTENNA | STPL9128 E   | Schwarzbeck     | 9128ES-121    | -            |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA      | SAS-571      | A.H.SYSTEM,INC  | 781           | 03, 05, 2025 |

**Test Conditions**

Temperature: (23,0 ± 0,7) °C  
Relative Humidity: (47,5 ± 0,9) % R.H.  
Atmospheric Pressure: (99,4 ± 0,0) kPa



**Test Specifications**

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance:  3 m

Field Strength:  1 V/m  3 V/m  
 10 V/m

Frequency Range:  80 MHz to 1 GHz  1,4 GHz to 2,7 GHz  
 80 MHz to 2,7 GHz

Modulation:  AM, 80 %, 1 kHz sine wave  
 PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step:  1 % step

Dwell Time:  1 s  3 s

# of Sides Radiated:  4

Required Performance Criteria:  Complied



**Test Data**

| Side Exposed | Observations |          |
|--------------|--------------|----------|
|              | Horizontal   | Vertical |
| Front        | Complied     | Complied |
| Right        | Complied     | Complied |
| Back         | Complied     | Complied |
| Left         | Complied     | Complied |

Note: "Blank" = Not performed

Observations:

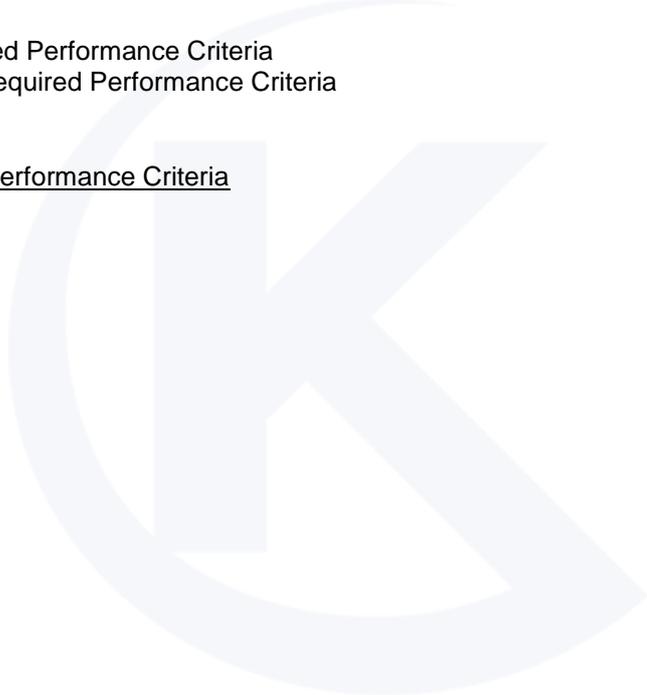
Complied – No degradation of function

**Test Results**

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria





### 3.3 Electrical Fast Transients/Bursts

**Reference Standard**

EN 61000-4-4

**Test Date**

Aug. 03, 2024

**Test Location**

EMS-EFT: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | iec.control  | EM TEST      | 5.4.8         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR   | UCS 500N7    | EM TEST      | P1608172950   | 11, 09, 2024 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC              | MV2616       | EM TEST      | P1552169719   | 11, 09, 2024 |
| <input checked="" type="checkbox"/> | CAPACITIVE COUPLING CLAMP | HFK          | EM TEST      | P1633183115   | 11, 10, 2024 |

**Test Conditions**

Temperature: (24,6 ± 0,2) °C  
 Relative Humidity: (48,9 ± 0,2) % R.H.  
 Atmospheric Pressure: (99,9 ± 0,0) kPa

**Test Specifications**

Pulse Amplitude & Polarity:  ± 1.0 kV  ± 2.0 kV  
 (AC Power Lines)  ± 4.0 kV

Pulse Amplitude & Polarity:  ± 0.5 kV  ± 1.0 kV  
 (Other supply / Signal Lines)  ± 2.0 kV

Burst Period:  300 ms  2 s

Repetition Rate:  5 klz  100 klz

Duration of Test Voltage:  ≥ 1 min

Required Performance Criteria:  Complied



**Test Data**

Input a.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

Input d.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| RJ-45(PoE)          | Complied       | Complied       |
| Alarm OUT           | Complied       | Complied       |
| Alarm IN            | Complied       | Complied       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

PASS Required Performance Criteria

NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5

**Test Date**

Aug. 03, 2024

**Test Location**

EMS-Surge: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST      | 5.4.8         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 09, 2024 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | P1552169719   | 11, 09, 2024 |
| <input checked="" type="checkbox"/> | CDN                     | CNV 508N1    | EM TEST      | P1610176296   | 11, 10, 2024 |

**Test Conditions**

Temperature: (24,6 ± 0,4) °C  
Relative Humidity: (48,9 ± 0,3) % R.H.  
Atmospheric Pressure: (99,9 ± 0,0) kPa



### Test Specifications

#### AC Power Lines

Source Impedance: 12 ohm for common Mode and 2 ohm for differential Mode

Surge Amplitude : Common Mode  
 (0,5 / 1,0 / 2,0) kV  
Differential Mode  
 (0,5 / 1,0) kV

Number of Surges:  5 surges per angle

Angle:  0°, 90°, 180°, 270° (input a.c. power port)

Polarity:  Positive & Negative

Repetition Rate:  1 surge per min  1 surge per 30 sec.

Required Performance Criteria:  Complied

#### Other supply / Signal Lines

Source Impedance: 42 ohm for common Mode

Surge Amplitude: Common Mode  
 (0,5 / 1,0) kV

Number of Surges:  5 Surges

Polarity:  Positive & Negative

Repetition Rate:  1 surge per min  1 surge per 30 sec.

Required Performance Criteria:  Complied



**Test Data**

Line to Line – Differential Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

**Signal Lines**

Line to Earth – Common Mode

| Mode of Application | Coupling Method | Observations   |                |
|---------------------|-----------------|----------------|----------------|
|                     |                 | (+) Surge (kV) | (-) Surge (kV) |
| RJ-45(PoE)          | CDN             | Complied       | Complied       |
|                     | LINE            | Complied       | Complied       |

Note:“Blank” = Not performed  
Observations:  
Complied – No degradation of function

**Test Results**

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6

**Test Date**

Aug. 01, 2024

**Test Location**

EMS-CS: Electro wave Shieldroom #7

**Test Equipment**

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | icd.control  | EM TEST      | 5.3.12        | -            |
| <input checked="" type="checkbox"/> | CONTINUOUS WAVE SIMULATOR | CWS 500N1.4  | EM TEST      | P1602169880   | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | ATTENUATOR                | ATT 6/80     | EM TEST      | P1614178148   | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | CDN                       | CDN M016     | TESEQ        | 43694         | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | CDN                       | CDN M016     | TESEQ        | 43697         | 11, 08, 2024 |
| <input type="checkbox"/>            | CDN                       | CDN T800     | TESEQ        | 42800         | 11, 08, 2024 |
| <input checked="" type="checkbox"/> | EM CLAMP                  | KEMZ 801A    | TESEQ        | 44099         | 11, 09, 2024 |
| <input checked="" type="checkbox"/> | CDN                       | CDN T8RJ45   | EM TEST      | 0909-09       | 07, 29, 2025 |

**Test Conditions**

Temperature: (24,8 ± 0,6) °C  
Relative Humidity: (49,8 ± 0,2) % R.H.  
Atmospheric Pressure: (99,4 ± 0,0) kPa



**Test Specifications**

- Frequency range:  150 kHz to 100 MHz  150 kHz to 80 MHz
- Voltage Level:  1 Vrms  3 Vrms  
 10 Vrms
- Modulation:  AM, 80 %, 1 kHz sine wave  
 PM, 1 Hz (0,5 s ON : 0,5 s OFF)
- Frequency step:  1 % step
- Dwell Time:  1 s  3 s
- Required Performance Criteria:  Complied





**Test Data**

Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| -                                    | -               | -            |

Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| -                                    | -               | -            |

Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| RJ-45(PoE)                           | CDN             | Complied     |
| Alarm OUT                            | Clamp           | Complied     |
| Alarm IN                             | Clamp           | Complied     |

Notes: CDN = Coupling Decoupling Network  
"blank" = Not performed

Observations:  
Complied – No degradation of function

**Test Results**

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria



### 3.6 Voltage Dips and Short Interruptions

**Reference Standard**

EN IEC 61000-4-11

**Test Date**

N/A

**Test Location**

EMS-Voltage dip: Electro wave Shieldroom #7

**Test Equipment**

| Used                     | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST      | 5.4.8         | -            |
| <input type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 09, 2024 |
| <input type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | P1552169719   | 11, 09, 2024 |

**Test Conditions**

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

kPa



**Test Specifications & Observations/Remarks**

- Voltage Dips and Short Interruptions

| <u>Test Level</u>                  | <u>Duration [in period/ms (50 Hz)]</u> | <u>Results</u> |
|------------------------------------|--|----------------|
| <input type="checkbox"/> 20 % dip  | <input type="checkbox"/> 250 / 5 000   | <u>N/A</u>     |
| <input type="checkbox"/> 30 % dip  | <input type="checkbox"/> 25 / 500      | <u>N/A</u>     |
| <input type="checkbox"/> 60 % dip  | <input type="checkbox"/> 10 / 200      | <u>N/A</u>     |
| <input type="checkbox"/> 100 % dip | <input type="checkbox"/> 250 / 5 000   | <u>N/A</u>     |

- Voltage variations

|                                      |                                       |            |
|--------------------------------------|---------------------------------------|------------|
| <input type="checkbox"/> Unom + 10 % | <input type="checkbox"/> 253.0 V (ac) | <u>N/A</u> |
| <input type="checkbox"/> Unom - 15 % | <input type="checkbox"/> 195.5 V (ac) | <u>N/A</u> |

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

**Test Results**

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria
- NOT APPLICABLE

**Remarks**

Refer to 'Remarks when standards applied'.



## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

[HOT]





[NEUTRAL]



◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

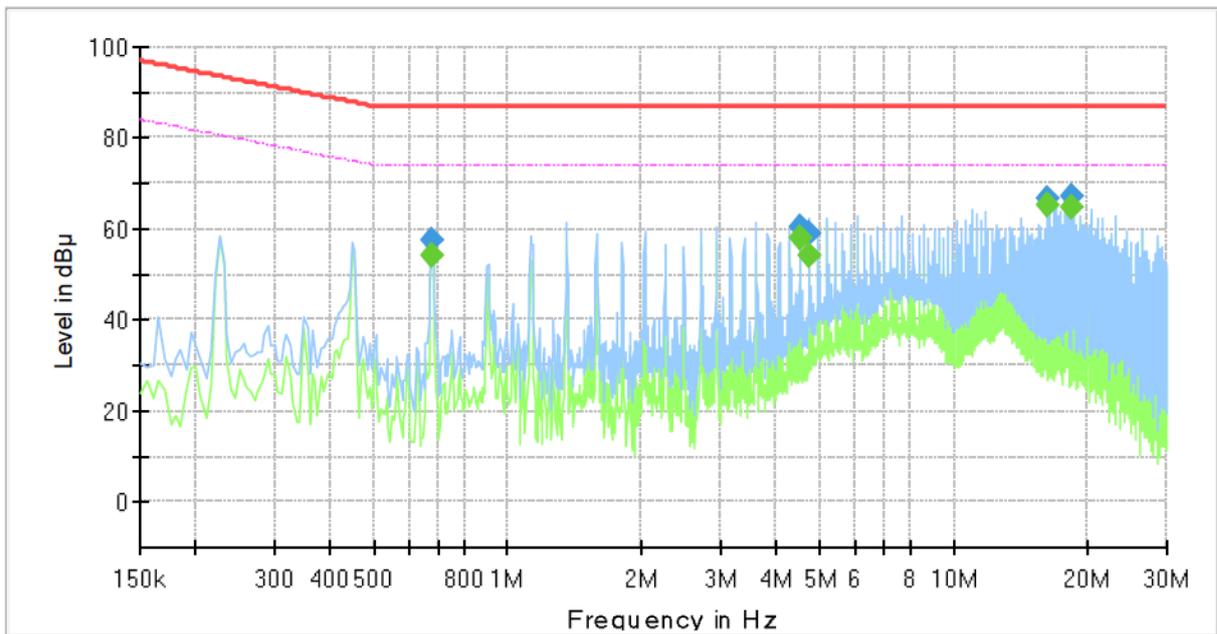


### Conducted Emissions at Telecommunication Ports

[100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Job No.:          | KES-EM242535               |
| Mode :            |                            |
| Speed :           | 100 Mbps                   |
| Operator Name:    | KES                        |



### Final Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.675000        | ---              | 54.32           | 74.00        | 19.68       | 1000.0          | 9.000           | Single Line | 19.5       |
| 0.675000        | 57.47            | ---             | 87.00        | 29.53       | 1000.0          | 9.000           | Single Line | 19.5       |
| 4.515000        | ---              | 57.96           | 74.00        | 16.04       | 1000.0          | 9.000           | Single Line | 19.6       |
| 4.515000        | 60.39            | ---             | 87.00        | 26.61       | 1000.0          | 9.000           | Single Line | 19.6       |
| 4.740000        | ---              | 54.24           | 74.00        | 19.76       | 1000.0          | 9.000           | Single Line | 19.7       |
| 4.740000        | 59.02            | ---             | 87.00        | 27.98       | 1000.0          | 9.000           | Single Line | 19.7       |
| 16.230000       | ---              | 65.29           | 74.00        | 8.71        | 1000.0          | 9.000           | Single Line | 20.0       |
| 16.230000       | 66.57            | ---             | 87.00        | 20.43       | 1000.0          | 9.000           | Single Line | 20.0       |
| 18.305000       | ---              | 64.75           | 74.00        | 9.25        | 1000.0          | 9.000           | Single Line | 20.1       |
| 18.305000       | 67.07            | ---             | 87.00        | 19.93       | 1000.0          | 9.000           | Single Line | 20.1       |

◆ Calculation

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

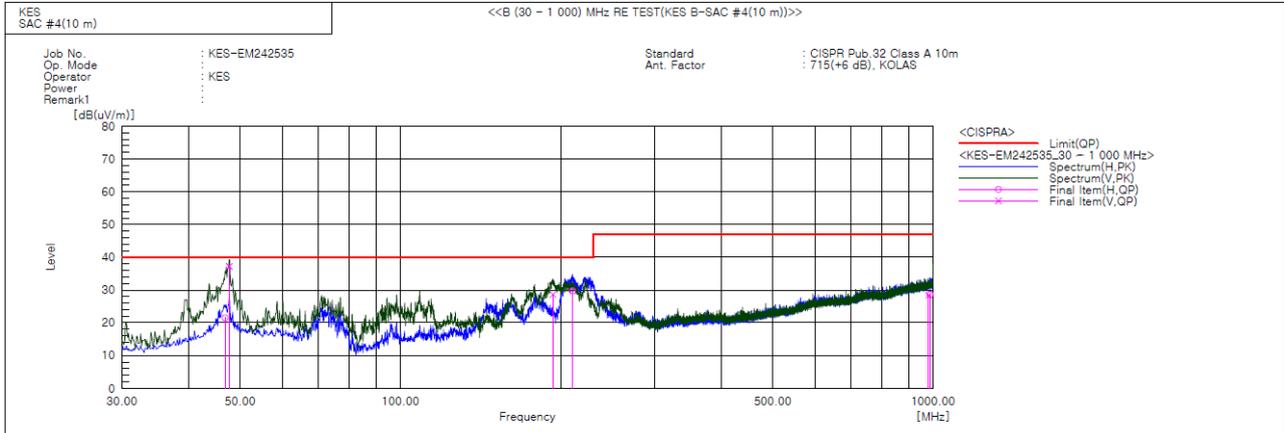
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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



Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 46.854          | H   | 42.8                | -21.3         | 21.5                 | 40.0                | 18.5           | 351.0       | 168.0       |        |
| 2   | 47.703          | V   | 58.4                | -21.2         | 37.2                 | 40.0                | 2.8            | 145.0       | 246.0       |        |
| 3   | 193.324         | V   | 50.2                | -21.6         | 28.6                 | 40.0                | 11.4           | 103.0       | 128.0       |        |
| 4   | 210.299         | H   | 49.7                | -20.0         | 29.7                 | 40.0                | 10.3           | 387.0       | 131.0       |        |
| 5   | 980.721         | V   | 30.5                | -2.1          | 28.4                 | 47.0                | 18.6           | 110.0       | 183.0       |        |
| 6   | 987.148         | H   | 30.7                | -2.0          | 28.7                 | 47.0                | 18.3           | 376.0       | 60.0        |        |

◆ Calculation

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

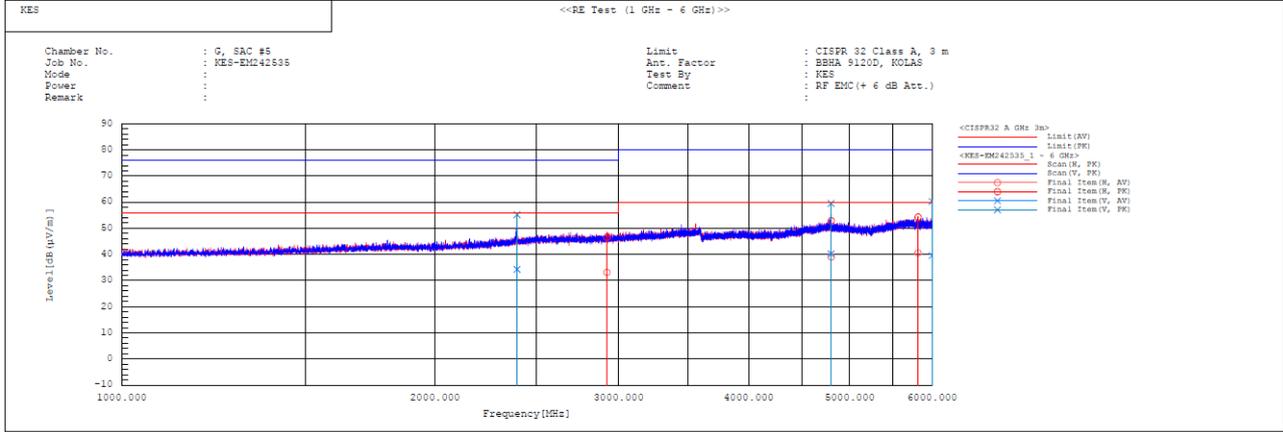
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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 GHz)



Final Result

| No. | Frequency [MHz] | Pol | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 2397.500        | V   | 29.9                | 50.8                | 4.4           | 34.3                 | 55.2                 | 56.0                | 76.0                | 21.7           | 20.8           | 100.0       | 264.9       |        |
| 2   | 2924.000        | H   | 27.1                | 40.6                | 6.0           | 33.1                 | 46.6                 | 56.0                | 76.0                | 22.9           | 29.4           | 100.0       | 93.6        |        |
| 3   | 4799.000        | V   | 28.6                | 47.9                | 11.6          | 40.2                 | 59.5                 | 60.0                | 80.0                | 19.8           | 20.5           | 100.0       | 168.4       |        |
| 4   | 4801.000        | H   | 27.4                | 41.3                | 11.6          | 39.0                 | 52.9                 | 60.0                | 80.0                | 21.0           | 27.1           | 100.0       | 0.1         |        |
| 5   | 5815.500        | H   | 26.7                | 40.4                | 13.9          | 40.6                 | 54.3                 | 60.0                | 80.0                | 19.4           | 25.7           | 100.0       | 357.1       |        |
| 6   | 5999.500        | V   | 25.4                | 46.1                | 14.2          | 39.6                 | 60.3                 | 60.0                | 80.0                | 20.4           | 19.7           | 100.0       | 191.4       |        |

◆ 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



### Harmonic Current Emissions and Voltage Fluctuations and Flicker

| <b>Average harmonic current results</b> |                      |            |           |        |
|---|----------------------|------------|-----------|--------|
| Hn                                      | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
| N/A                                     |                      |            |           |        |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

\* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Harmonics (continued)

| <b>Maximum harmonic current results</b> |                      |            |           |        |
|---|----------------------|------------|-----------|--------|
| Hn                                      | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
|   |                      | N/A        |           |        |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

\* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.



Test Data - Voltage Fluctuations

## Maximum Flicker results

| Flicker Measurements |     |         |        |          |          |
|----------------------|-----|---------|--------|----------|----------|
|                      | Plt | Max Pst | Max Dc | Max Dmax | Max Tmax |
| Line 1:              | N/A |         |        |          |          |
| Limits:              |     |         |        |          |          |
| Results:             |     |         |        |          |          |





## **Test Setup Photos and Configuration Conducted Emissions at Mains Power Ports**

N/A



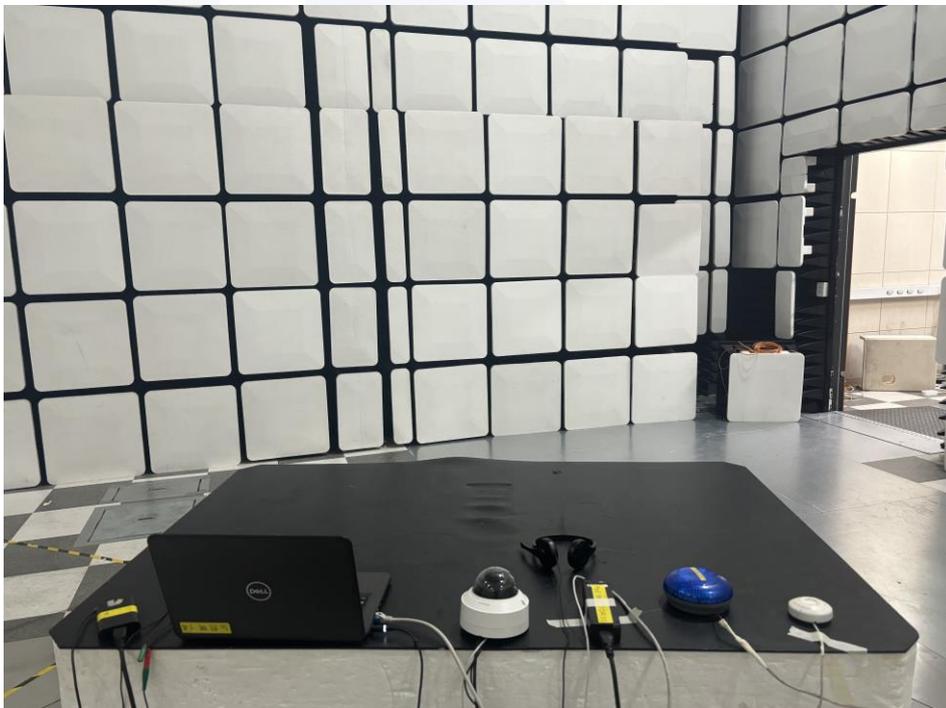
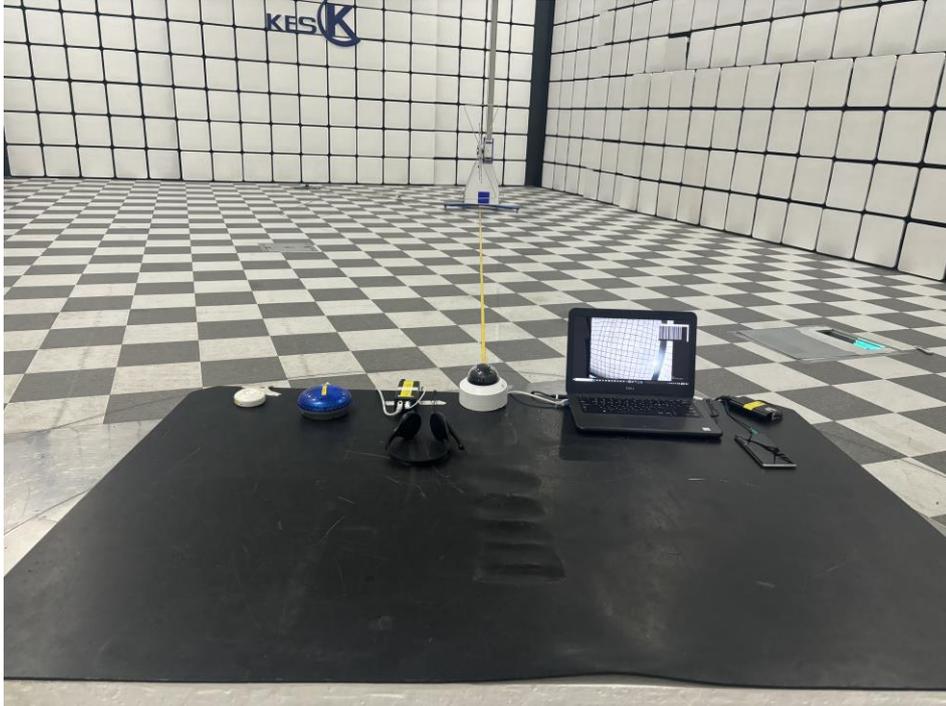


### Conducted Emissions at Telecommunication Ports



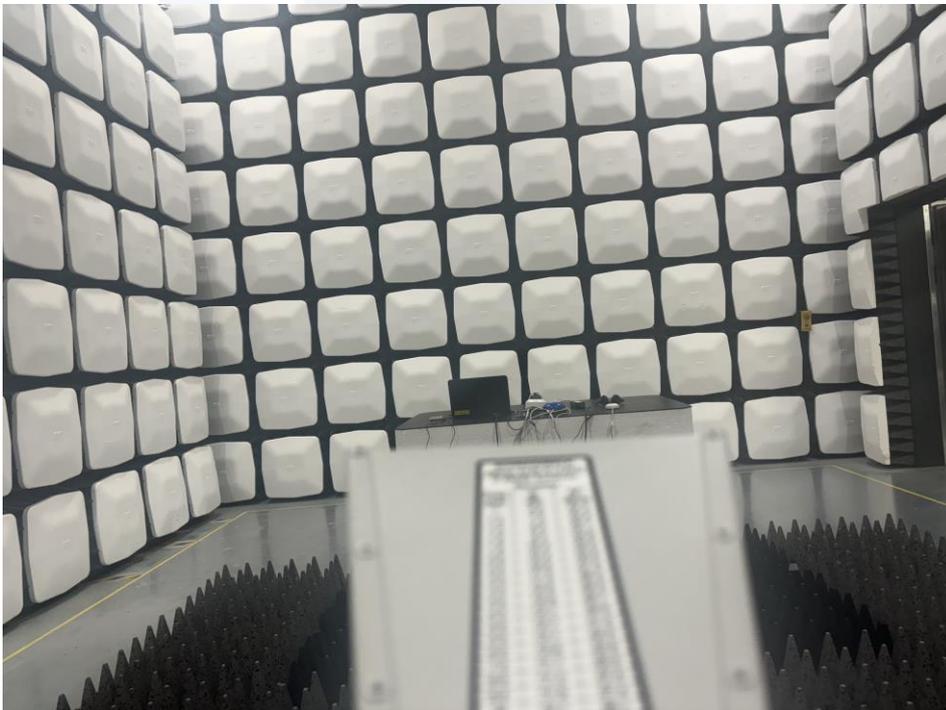
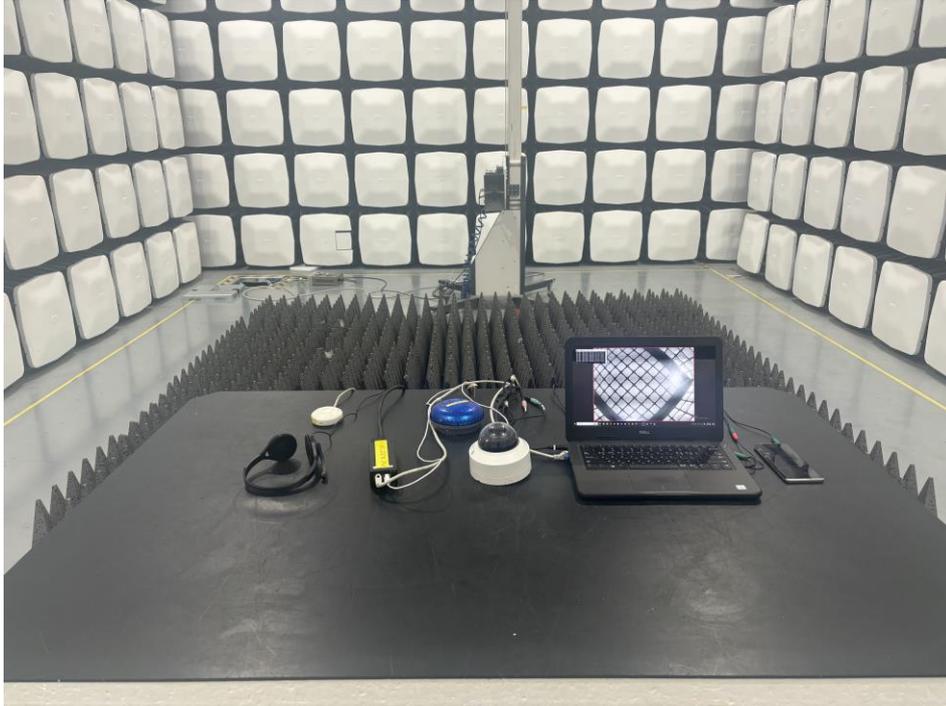


### Radiated Electric Field Emissions(Below 1 GHz)





### Radiated Electric Field Emissions(Above 1 GHz)





## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

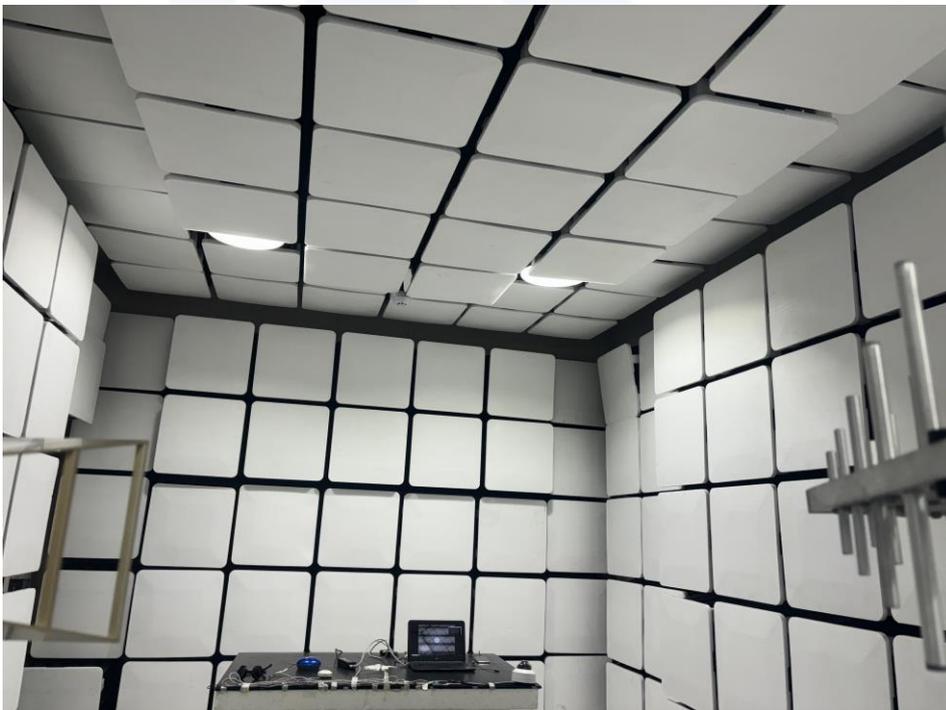




## Electrostatic Discharge



## Radiated Electric Field Immunity





### Electrical Fast Transients/Bursts



### Surge Transients





## Conducted Disturbance



## Voltage Dips and Short Interruptions

N/A



## EUT External Photographs

(Top)



(Bottom)





## EUT Internal Photographs

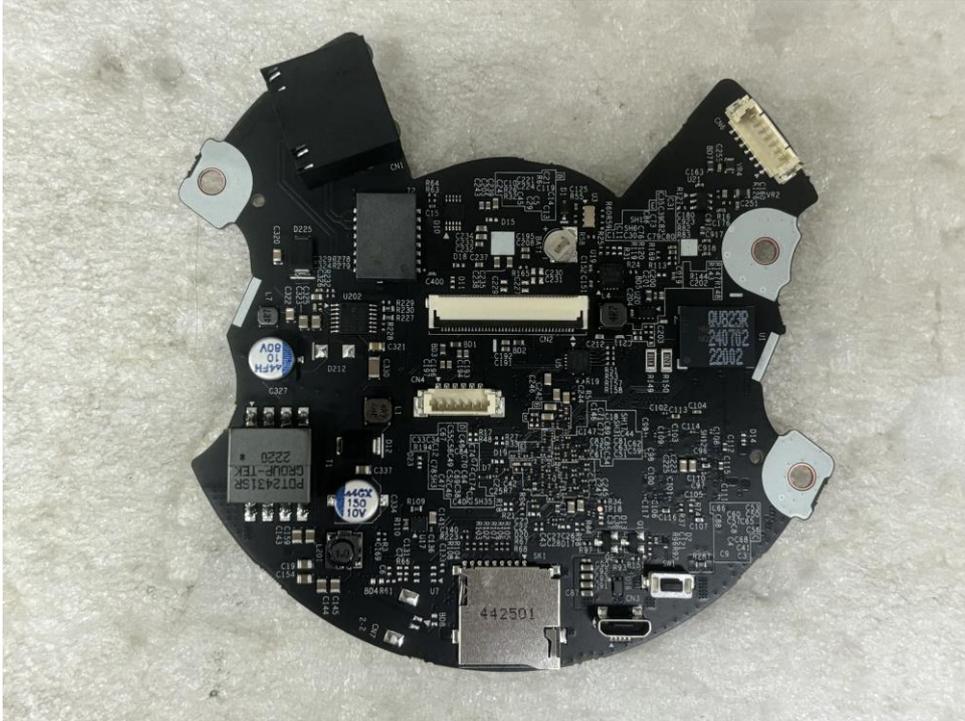
(Internal View)



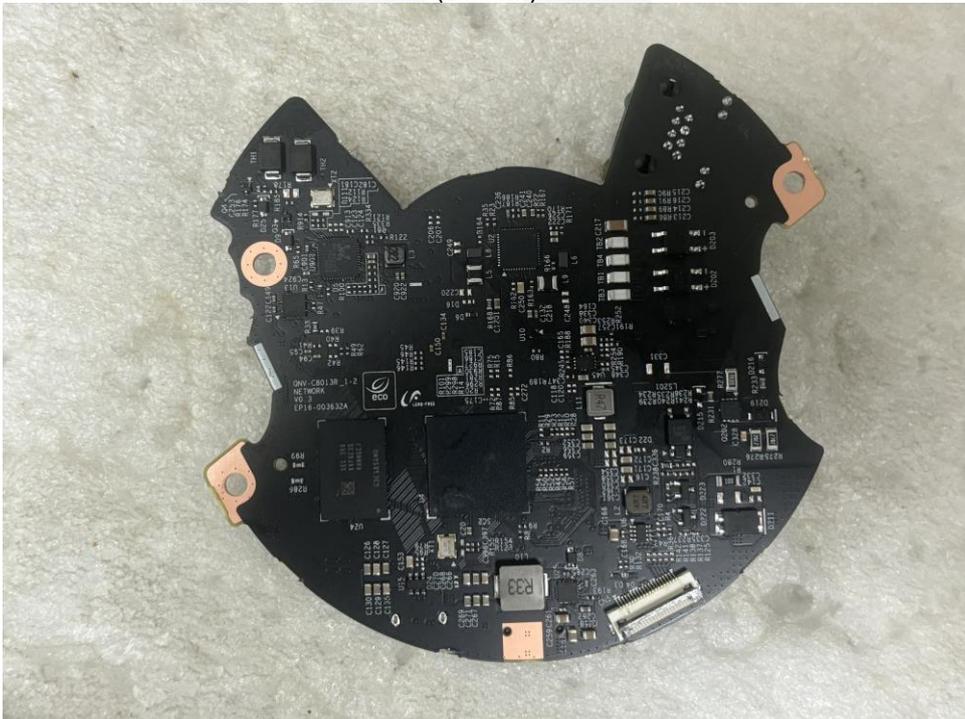


### EUT Internal View – Board 1

(Top)



(Bottom)





### EUT Internal View – Board 2

(Top)



(Bottom)





### EUT Internal View – Board 3

(Top)



(Bottom)





### EUT Internal View – Lens

(Top)



(Bottom)





### Label and Location



|   |  |
|---|--|
| <p><b><u>NETWORK CAMERA</u></b></p> <p>Model No : QNV-C8023R</p> <p>Manufacturer : HANVHA VISION VIETNAM COMPANY LIMITED</p> <p>Made in Vietnam</p> |  |
|---|--|