

**KES Co., Ltd.**

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Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Report No.:  
KES-EM-23T0817  
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# EMC TEST REPORT

Test Report No. : KES-EM-23T0817  
Date of Issue : Sep. 15, 2023  
Product name : NETWORK CAMERA  
Model/Type No. : ANO-L7022R  
Variant Model : ANO-L7012R  
Applicant : Hanwha Vision Co., Ltd  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED  
2. D-TECH CO.,LTD.  
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,  
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,  
Korea (Suwon Industrial Complex)  
Date of Receipt : Aug. 24, 2023  
Test date : Sep. 09, 2023 ~ Sep. 11, 2023  
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Reviewed by

Dong Yun, Lee  
EMC Test Engineer

Dae Jung, Choi  
EMC Technical Manager

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

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### REPORT REVISION HISTORY

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| Sep. 15, 2023 | KES-EM-23T0817  | Issued           |
|               |                 |                  |
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## 1.0 General Product Description

### Main Specifications of EUT are:

|                             |                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Video                       |                                                                                                                               |
| Imaging Device              | 1/3" CMOS                                                                                                                     |
| Resolution                  | 2560 x 1440, 1920 x 1080, 1280 x 960, 1280 x 720, 800 x 600, 800 x 448, 720 x 576, 720 x 480, 640 x 480, 640 x 360, 320 x 240 |
| Max. Framerate              | H.265/H.264 : Max. 30fps at 4M all resolutions<br>MJPEG : Max. 15fps                                                          |
| NETD                        | None                                                                                                                          |
| Pixel Size                  | None                                                                                                                          |
| Min. Illumination           | Color : 0.13Lux (F1.6, 1/30sec)<br>B/W : 0Lux (IR LED On)                                                                     |
| Video Out                   | None                                                                                                                          |
| Video Transmission Distance | None                                                                                                                          |
| Lens                        |                                                                                                                               |
| Focal Length (Zoom Ratio)   | 4mm fixed focal                                                                                                               |
| Max. Aperture Ratio         | F1.6                                                                                                                          |
| Angular Field of View       | H: 78.3° / V: 42.9° / D: 91.2°                                                                                                |
| Min. Object Distance        | 1.7m(5.6ft)                                                                                                                   |
| Focus Control               | Fixed                                                                                                                         |
| Lens Type                   | None                                                                                                                          |
| Mount Type                  | None                                                                                                                          |
| Optional Lens               | None                                                                                                                          |
| Pan / Tilt / Rotate         |                                                                                                                               |
| Pan / Tilt / Rotate Range   | None                                                                                                                          |
| 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, SDDR                                                                                                                |
| Wide Dynamic Range          | 120dB                                                                                                                         |
| Digital Noise Reduction     | SSNR                                                                                                                          |
| Digital Image Stabilization | None                                                                                                                          |
| Defog                       | None                                                                                                                          |
| Motion Detection            | 4ea. polygonal zones                                                                                                          |
| Privacy Masking             | 6ea. rectangular zones                                                                                                        |
| Gain Control                | Low / Middle / High                                                                                                           |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor                                                                                         |
| LDC                         | Support                                                                                                                       |
| Electronic Shutter Speed    | Minimum/Maximum/Anti flicker (1/5~1/12,000sec)                                                                                |

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|                                           |                                                                                                                                                                                                            |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital PTZ                               | None                                                                                                                                                                                                       |
| Video Rotation                            | Flip, Mirror, Hallway view(90°/270°)                                                                                                                                                                       |
| Analytics                                 | Defocus detection, Directional detection,<br>Motion detection, Enter/Exit, Tampering, Virtual line                                                                                                         |
| Business Intelligence                     | None                                                                                                                                                                                                       |
| Serial Interface                          | None                                                                                                                                                                                                       |
| Alarm I/O                                 | None                                                                                                                                                                                                       |
| Alarm Triggers                            | Analytics, Network disconnect<br>* Alarm input(with NW I/O Box)                                                                                                                                            |
| Alarm Events                              | File upload via FTP and e-mail,<br>Notification via e-mail,<br>SD/SDHC/SDXC or NAS recording at event triggers,<br>Handover                                                                                |
| Audio Streaming                           | None                                                                                                                                                                                                       |
| Audio In                                  | None                                                                                                                                                                                                       |
| Audio Out                                 | None                                                                                                                                                                                                       |
| IR Viewable Length                        | 25m(82.02ft)                                                                                                                                                                                               |
| 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                                  | RJ-45 (10/100BASE-T)                                                                                                                                                                                       |
| Video Compression                         | H.265/H.264 : Main/High, MJPEG                                                                                                                                                                             |
| Audio Compression                         | None                                                                                                                                                                                                       |
| Smart Codec                               | Manual (Sea area), WiseStream II                                                                                                                                                                           |
| Video Quality Adjustment                  | H.265/H.264 : Target bitrate level control,<br>MJPEG : Quality level control                                                                                                                               |
| Bitrate Control                           | H.264/H.265 : CBR or VBR<br>MJPEG : VBR                                                                                                                                                                    |
| Streaming                                 | Unicast (6 users) / Multicast<br>Multiple streaming (Up to 3 profiles)                                                                                                                                     |
| Protocol                                  | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS,<br>SSL/TLS, DHCP, PPPoE, FTP,<br>SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP,<br>Bonjour, LLDP |
| SIP support (VoIP, Peer-to-peer, SIP/PBX) | None                                                                                                                                                                                                       |

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|                                   |                                                                                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Security                          | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access Log<br>802.1X Authentication            |
| Application Programming Interface | ONVIF Profile S/G/T,<br>SUNAPI (HTTP API)                                                                                                     |
| General                           |                                                                                                                                               |
| Webpage Language                  | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian,<br>Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek |
| Web Viewer                        | None                                                                                                                                          |
| Edge Storage                      | Micro SD/SDHC/SDXC 1slot 128GB                                                                                                                |
| Memory                            | 512MB RAM, 256MB Flash                                                                                                                        |
| Environmental & Electrical        |                                                                                                                                               |
| Operating Temperature / Humidity  | -30°C ~ +55°C (-22°F~+131°F) / Less than 95% RH                                                                                               |
| Storage Temperature / Humidity    | -30°C ~ +55°C (-22°F~+131°F) / Less than 95% RH                                                                                               |
| Certification                     | IP66                                                                                                                                          |
| Input Voltage                     | PoE(IEEE802.3af, Class3)                                                                                                                      |
| Power Consumption                 | Max 7.5W, typical 5.7W                                                                                                                        |
| Mechanical                        |                                                                                                                                               |
| Color / Material                  | White / Plastic                                                                                                                               |
| RAL Code                          | RAL9003                                                                                                                                       |
| Product Dimensions / Weight       | Ø78.0x262.0mm(Ø3.07x10.31"), 390g(0.86lb)                                                                                                     |
| Compatible Conduit hole / Gangbox | None                                                                                                                                          |
| Hanging Mount (Dome)              | None                                                                                                                                          |
| Skin Cover                        | None                                                                                                                                          |
| Skin Cover (Dome)                 | None                                                                                                                                          |
| Weather Cap (Dome)                | None                                                                                                                                          |
| Power Module                      | None                                                                                                                                          |
| Backbox                           | None                                                                                                                                          |
| DORI (EN62676-4 standard)         |                                                                                                                                               |
| Detect (25PPM/ 8PPF)              | 62.9m(206.33ft)                                                                                                                               |
| Observe (63PPM/ 19PPF)            | 25.2m(82.53ft)                                                                                                                                |
| Recognize (125PPM/ 38PPF)         | 12.6m(41.27ft)                                                                                                                                |
| Identify (250PPM/ 76PPF)          | 6.3m(20.63ft)                                                                                                                                 |
| 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                                                                                                                                          |

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## 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 Injector Input power)

## 1.2 Variant Model Differences

Add derivative model for vendor management

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                          | Remarks |
|----------------|--------------|---------------|---------------------------------------|---------|
| NETWORK CAMERA | ANO-L7022R   | -             | HANWHA VISION VIETNAM COMPANY LIMITED | EUT     |

## 1.5 Support Equipments

| Description    | Model Number     | Serial Number | Manufacturer                               | Remarks |
|----------------|------------------|---------------|--------------------------------------------|---------|
| PoE Injector   | PT-PSE109GBRO-AH | -             | Dongguan PROCET Network Technology Co.,Ltd | -       |
| Laptop         | P95G001          | 9JM8HT2       | DELL INC.                                  | -       |
| Laptop Adapter | HA65NM130        | -             | Chicony Power Technology(Suzhou)Co.,Ltd.   | -       |
| Micro SD Card  | -                | -             | SanDisk                                    | 16 GB   |

## 1.6 External I/O Cabling

| Start                |               | END            |               | Cable Spec. |        |
|----------------------|---------------|----------------|---------------|-------------|--------|
| Description          | I/O Port      | Description    | I/O Port      | Length      | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (PoE)   | PoE Injector   | RJ-45 (PoE)   | 3.5         | U      |
|                      | Micro SD Slot | Micro SD Card  | Micro SD Slot | -           | -      |
| PoE Injector         | RJ-45 (LAN)   | Laptop         | RJ-45 (LAN)   | 1.5         | U      |
| Laptop               | DC Jack       | Laptop Adapter | DC Jack       | 1.6         | U      |

\* Unshielded = U, Shielded = S

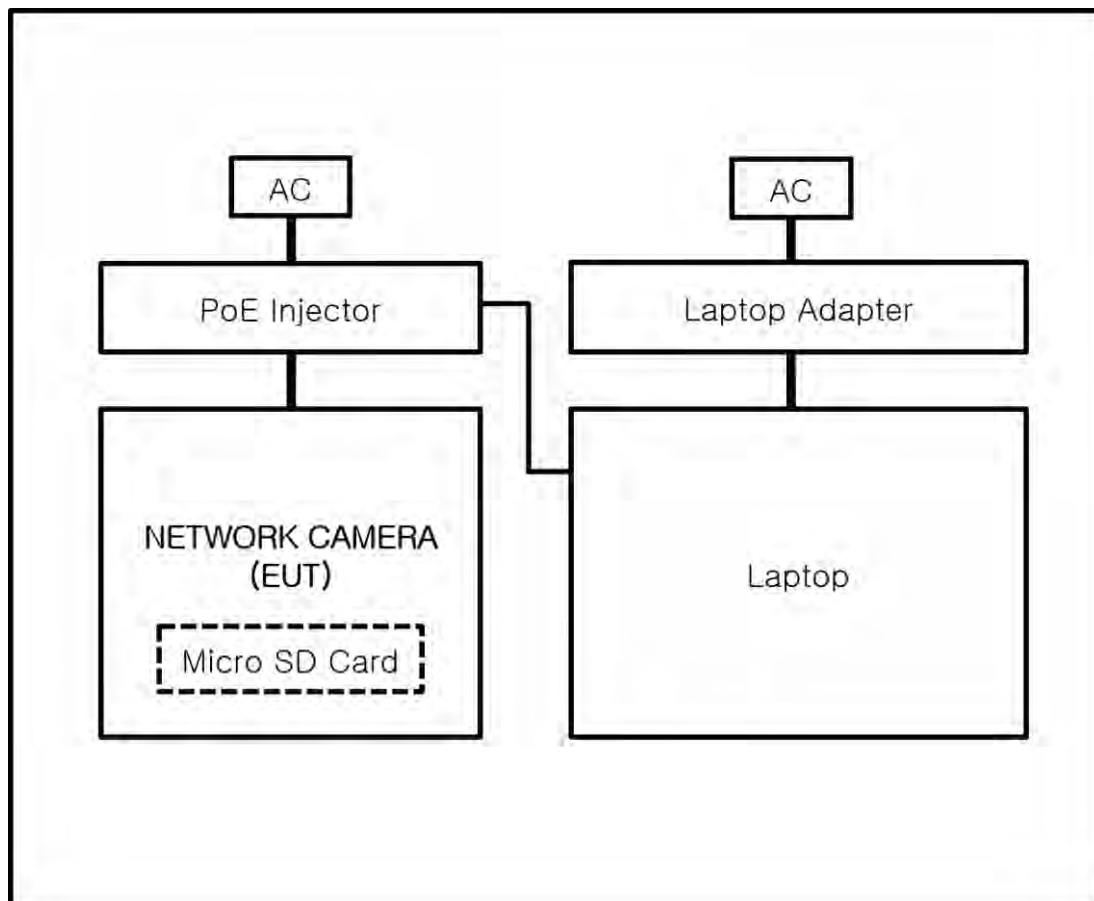
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## 1.7 EUT Operating Mode(s)

| Test mode | operating                                                                                                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation | 1. Check if the EUT image is output to the laptop normally.<br>2. Check if the network is operating normally through a ping test.<br>3. After the test, check if the EUT video has been recorded normally. |

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

## 1.8 Configuration



## 1.9 Remarks when standards applied

The mains power ports were excluded tested, because the EUT operated by PoE powered.

## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

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

## 1.12 Laboratory Accreditations and Listings

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

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

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

**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**

Sep. 09, 2023

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101783        | 11, 11, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 11, 22, 2023 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 11, 22, 2023 |
| <input type="checkbox"/>            | CDN               | CDNS502A     | TESEQ        | 40431         | 11, 10, 2023 |

**Test Conditions**

Temperature: (24,8 ± 0,1) °C

Relative Humidity: (48,6 ± 0,1) % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

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

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

**Test Date**

Sep. 09, 2023

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

**Test Conditions**Temperature: (24,6 ± 0,1) °C  
Relative Humidity: (48,6 ± 0,1) % R.H.**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE**Remarks**See Appendix A for test data.

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

**Test Date**

Sep. 09, 2023

**Test Location**

SEMI ANECHOIC CHAMBER #3

**Test Equipment**

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

**Test Conditions**

Temperature: (24,7 ± 0,2) °C

Relative Humidity: (48,6 ± 0,2) % 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.



## 2.5 Harmonic Current Emissions

### Test Date

N/A

### Test Location

Electro wave Shieldroom #3

### 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, 27, 2024 |
| <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'.

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## 2.6 Voltage Fluctuations and Flicker

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #3

**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, 27, 2024 |
| <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'.

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### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011/A1 :2014 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 61000-4-2:2009

#### Test Date

Sep. 11, 2023

#### Test Location

EMS-ESD: Electro wave Shieldroom #7

#### Test Equipment

| Used                                | Description   | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | ESD SIMULATOR | ESS-2000     | Noise Ken    | ESS01Z0454    | 01, 31, 2024 |
| <input checked="" type="checkbox"/> | HCP           | -            | KES          | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | Noise Ken    | -             | -            |

#### Test Conditions

Temperature: (24,7 ± 0,1) °C  
Relative Humidity: (48,4 ± 0,1) % R.H.  
Atmospheric Pressure: (100,2 ± 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           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           |

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

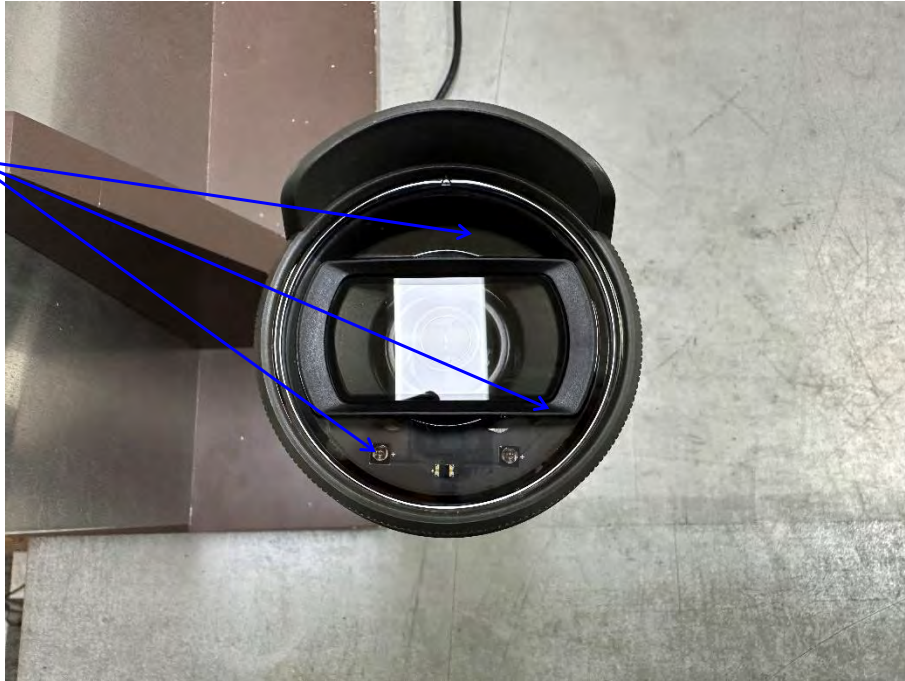
Required Performance Criteria: ☒ Complied

**Location of Discharge:**

|         |
|---------|
| Air     |
| Contact |



1



1



2

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**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  | Air Discharge     | Complied     | -       |
| 2   | Screw      | Contact Discharge | Complied     | -       |
| 3   | RJ-45 Port | Air 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

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## 3.2 Radiated Electric Field Immunity

**Reference Standard**

EN IEC 61000-4-3:2020

**Test Date**

Sep. 09, 2023

**Test Location**EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3**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, 31, 2024 |
| <input checked="" type="checkbox"/> | HIGH POWER DUAL AMP             | SSA532       | SUNGSAN         | SSA532-001    | -            |
| <input checked="" type="checkbox"/> | POWER METER                     | E4419B       | Agilent         | GB40203000    | 03, 21, 2024 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY52170007    | 03, 21, 2024 |
| <input checked="" type="checkbox"/> | AVERAGE POWER SENSOR            | E9301A       | Agilent         | MY41498669    | 03, 21, 2024 |
| <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, 06, 2024 |

**Test Conditions**

Temperature: (24,7 ± 0,2) °C  
Relative Humidity: (48,6 ± 0,2) % R.H.  
Atmospheric Pressure: (100,2 ± 0,0) kPa



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### 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

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**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

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### 3.3 Electrical Fast Transients/Bursts

#### Reference Standard

EN 61000-4-4:2012

#### Test Date

Sep. 11, 2023

#### 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, 28, 2023 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC              | MV2616       | EM TEST      | P1552169719   | 11, 29, 2023 |
| <input checked="" type="checkbox"/> | CAPACITIVE COUPLING CLAMP | HFK          | EM TEST      | P1633183115   | 11, 28, 2023 |

#### Test Conditions

Temperature:  $(24,7 \pm 0,1) ^\circ\text{C}$   
Relative Humidity:  $(48,4 \pm 0,1) \% \text{ R.H.}$   
Atmospheric Pressure:  $(100,2 \pm 0,0) \text{ kPa}$

#### Test Specifications

Pulse Amplitude & Polarity:  
(AC Power Lines) ☐  $\pm 1.0 \text{ kV}$  ☐  $\pm 2.0 \text{ kV}$   
☐  $\pm 4.0 \text{ kV}$

Pulse Amplitude & Polarity:  
(Other supply / Signal Lines) ☐  $\pm 0.5 \text{ kV}$  ☒  $\pm 1.0 \text{ kV}$   
☐  $\pm 2.0 \text{ kV}$

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒  $\geq 1 \text{ min}$

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       |

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

- Refer to ‘Remarks when standards applied’.

### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5:2014+A1:2017

**Test Date**

Sep. 11, 2023

**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<br>SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 28, 2023 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC               | MV2616       | EM TEST      | P1552169719   | 11, 29, 2023 |
| <input checked="" type="checkbox"/> | CDN                        | CNV 508N1    | EM TEST      | P1610176296   | 11, 29, 2023 |

**Test Conditions**

Temperature: (24,7 ± 0,3) °C  
Relative Humidity: (48,4 ± 0,3) % R.H.  
Atmospheric Pressure: (100,2 ± 0,0) kPa



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### 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

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**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

- Refer to 'Remarks when standards applied'.

### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6:2014

**Test Date**

Sep. 10, 2023

**Test Location**

EMS-CS: Electro wave Shieldroom #6

**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, 10, 2023 |
| <input checked="" type="checkbox"/> | ATTENUATOR                | ATT 6/80     | EM TEST      | P1614178148   | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | CDN                       | CDN M016     | TESEQ        | 43694         | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | CDN                       | CDN M016     | TESEQ        | 43697         | 11, 10, 2023 |
| <input checked="" type="checkbox"/> | CDN                       | CDN T8RJ45   | EM TEST      | 0909-09       | 07, 31, 2024 |
| <input type="checkbox"/>            | EM CLAMP                  | KEMZ 801A    | TESEQ        | 44099         | 11, 14, 2023 |

**Test Conditions**

Temperature: (24,6 ± 0,2) °C  
Relative Humidity: (48,7 ± 0,2) % R.H.  
Atmospheric Pressure: (99,8 ± 0,0) kPa



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### 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

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**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     |

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

- Refer to 'Remarks when standards applied'.

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### 3.6 Voltage Dips and Short Interruptions

**Reference Standard**

EN IEC 61000-4-11:2020

**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<br>SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 29, 2023 |
| <input type="checkbox"/> | MOTOR VARIAC               | MV2616       | EM TEST      | P1552169719   | 11, 29, 2023 |

**Test Conditions**

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

kPa

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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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KES-EM-23T0817

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### 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'.

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## **APPENDIX A – TEST DATA**

### **Conducted Emissions at Mains Power Ports**

**[HOT]**

N/A

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[NEUTRAL]

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

---

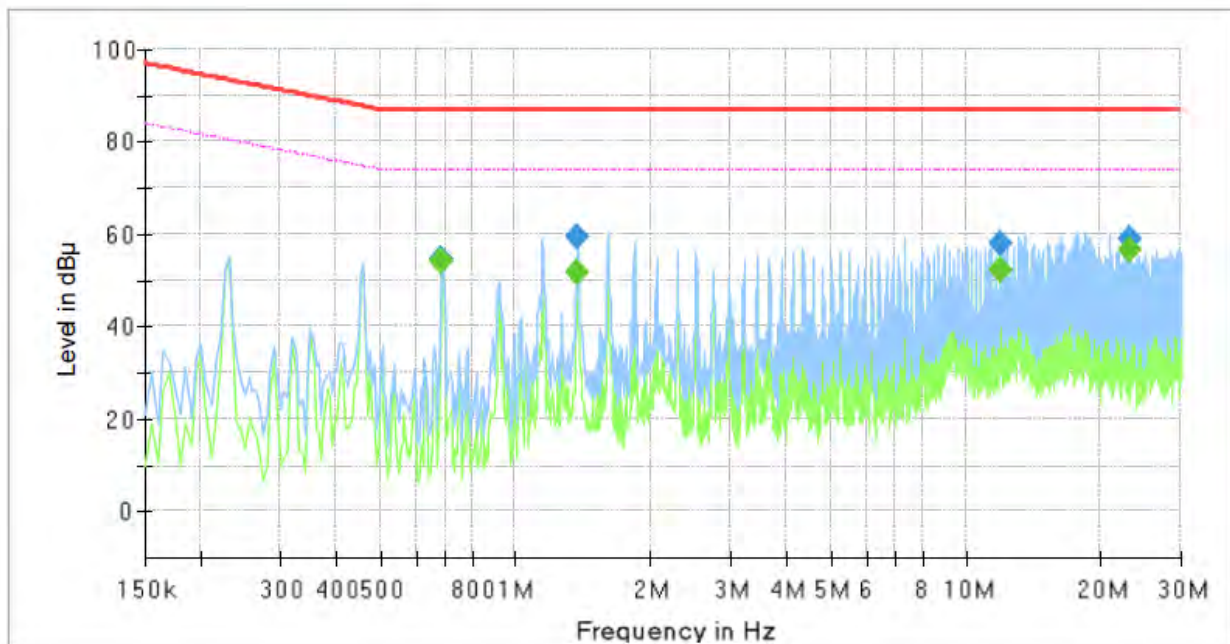
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## Conducted Emissions at Telecommunication Ports

[100 Mbps]

### Common Information

Test Description: Telecommunication Emission  
 Model No.: ANO-L7022R  
 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.685000        | ---              | 54.32           | 74.00        | 19.68       | 1000.0          | 9.000           | Single Line | 19.4       |
| 0.685000        | 54.69            | ---             | 87.00        | 32.31       | 1000.0          | 9.000           | Single Line | 19.4       |
| 1.370000        | ---              | 51.88           | 74.00        | 22.12       | 1000.0          | 9.000           | Single Line | 19.4       |
| 1.370000        | 59.40            | ---             | 87.00        | 27.60       | 1000.0          | 9.000           | Single Line | 19.4       |
| 11.890000       | ---              | 52.09           | 74.00        | 21.91       | 1000.0          | 9.000           | Single Line | 19.7       |
| 11.890000       | 57.93            | ---             | 87.00        | 29.07       | 1000.0          | 9.000           | Single Line | 19.7       |
| 23.130000       | ---              | 56.67           | 74.00        | 17.33       | 1000.0          | 9.000           | Single Line | 20.1       |
| 23.130000       | 58.93            | ---             | 87.00        | 28.07       | 1000.0          | 9.000           | Single Line | 20.1       |

#### ◆ Calculation

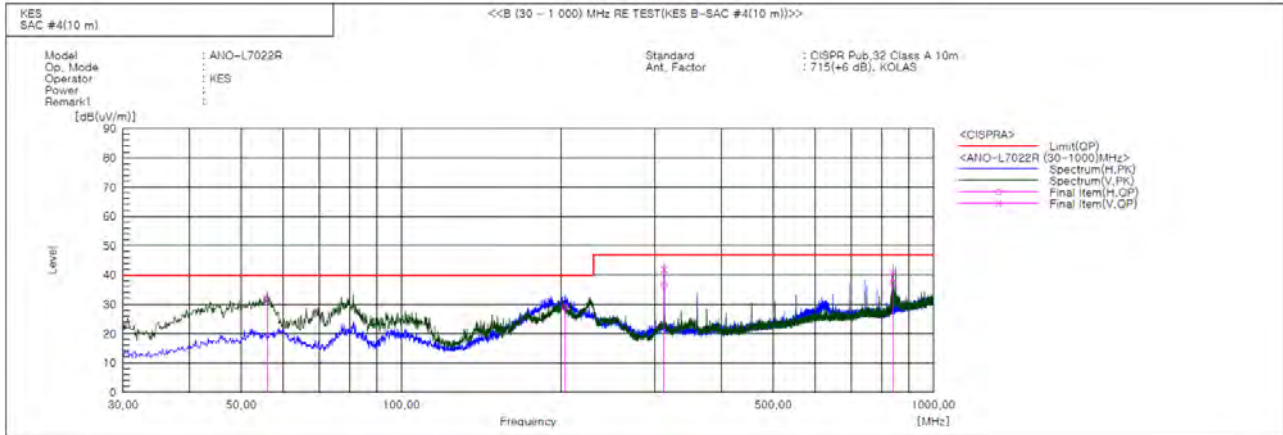
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

## Radiated Electric Field Emissions(Below 1 GHz)



### 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   | 55.948          | V   | 52.7                | -20.8         | 31.9                 | 40.0                | 8.1            | 105.0       | 91.0        |        |
| 2   | 203.388         | H   | 49.6                | -20.7         | 28.9                 | 40.0                | 11.1           | 399.0       | 173.0       |        |
| 3   | 311.906         | H   | 53.5                | -16.9         | 36.6                 | 47.0                | 10.4           | 393.0       | 217.0       |        |
| 4   | 311.915         | V   | 58.7                | -16.9         | 41.8                 | 47.0                | 5.2            | 104.0       | 340.0       |        |
| 5   | 840.066         | H   | 43.0                | -5.8          | 37.2                 | 47.0                | 9.8            | 390.0       | 150.0       |        |
| 6   | 840.071         | V   | 46.7                | -5.8          | 40.9                 | 47.0                | 6.1            | 114.0       | 151.0       |        |

### ◆ Calculation

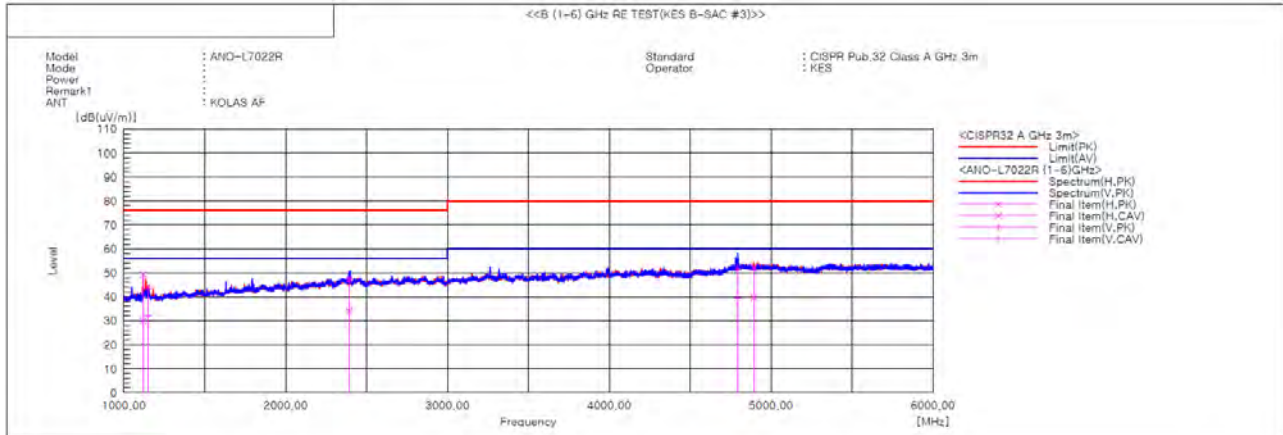
Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

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] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1   | 1119.499        | H   | 52.1                | 32.9                 | -2.8          | 49.3                 | 30.1                  | 76.0                | 56.0                | 26.7           | 25.9            | 100.0       | 252.9       |        |
| 2   | 1149.270        | V   | 46.0                | 34.7                 | -2.6          | 43.4                 | 32.1                  | 76.0                | 56.0                | 32.6           | 23.9            | 100.0       | 148.8       |        |
| 3   | 2392.692        | H   | 41.1                | 27.7                 | 6.3           | 47.4                 | 34.0                  | 76.0                | 56.0                | 28.6           | 22.0            | 100.0       | 166.7       |        |
| 4   | 2394.350        | V   | 41.2                | 28.0                 | 6.3           | 47.5                 | 34.3                  | 76.0                | 56.0                | 28.5           | 21.7            | 100.0       | 129.2       |        |
| 5   | 4793.118        | V   | 37.8                | 25.2                 | 14.3          | 52.1                 | 39.5                  | 80.0                | 60.0                | 27.9           | 20.5            | 100.0       | 34.9        |        |
| 6   | 4892.973        | H   | 37.5                | 24.8                 | 15.0          | 52.5                 | 39.8                  | 80.0                | 60.0                | 27.5           | 20.2            | 100.0       | 9.1         |        |

### ◆ 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



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Test Data - Voltage Fluctuations

## Maximum Flicker results

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

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## **Test Setup Photos and Configuration**

### **Conducted Emissions at Mains Power Ports**

N/A

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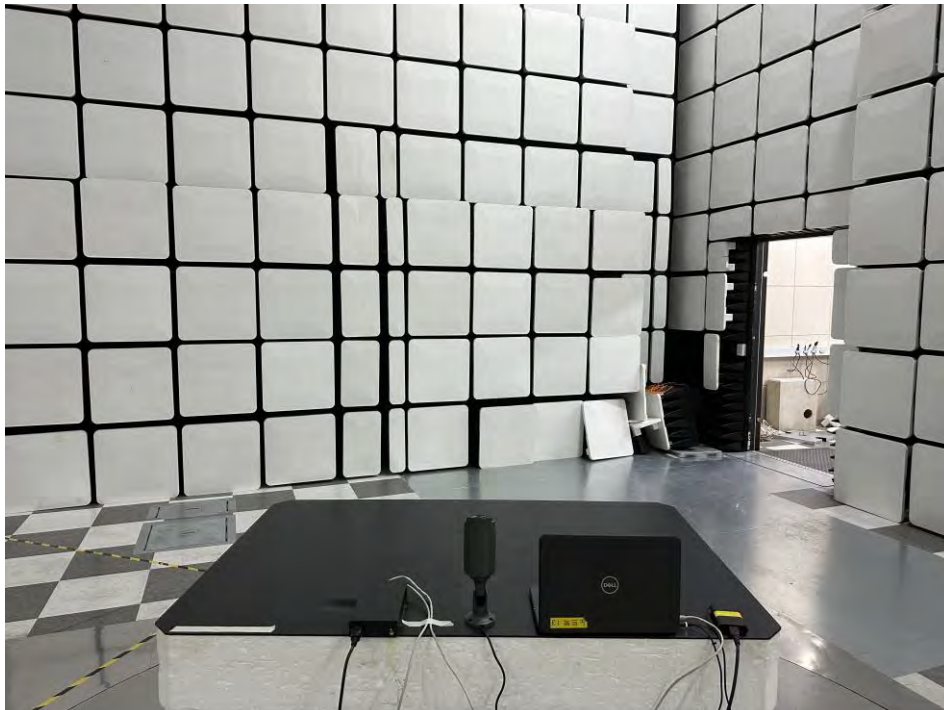
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## Conducted Emissions at Telecommunication Ports



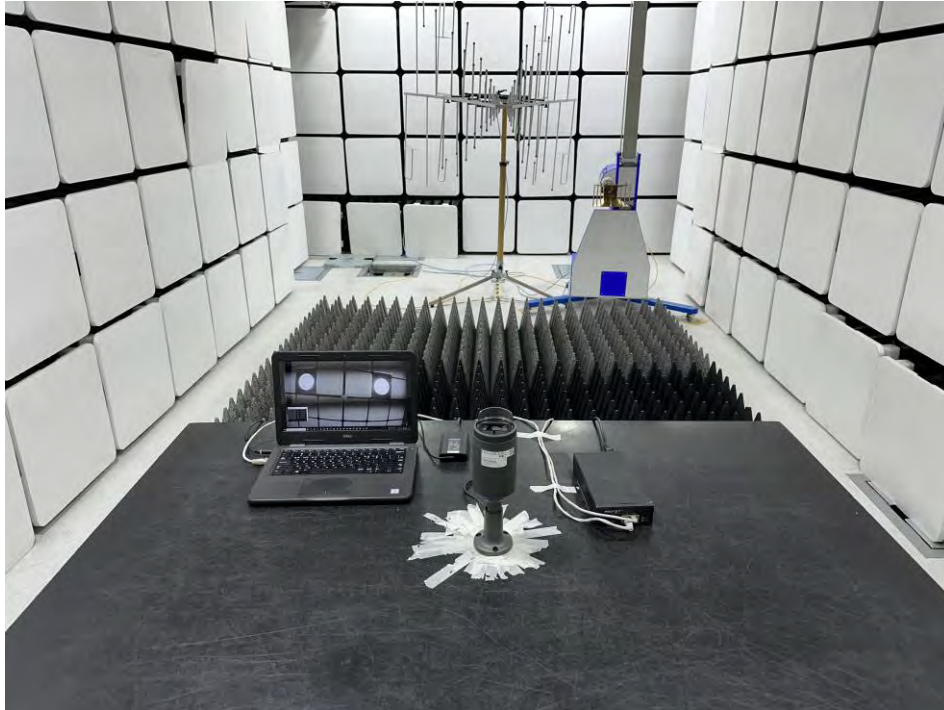
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## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



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**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

N/A

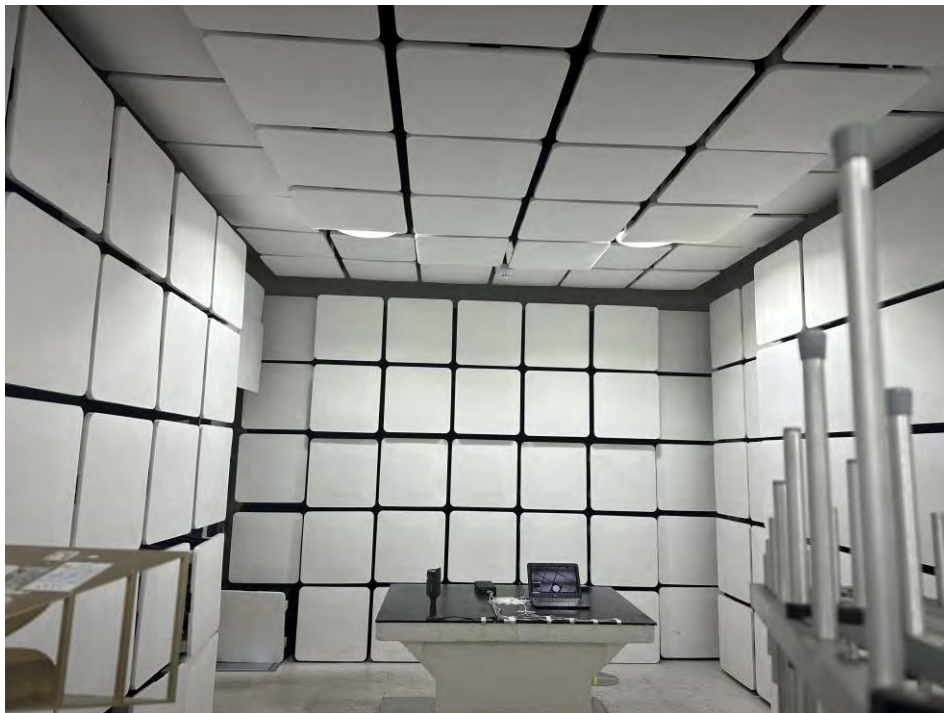
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## Electrostatic Discharge



## Radiated Electric Field Immunity



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## Electrical Fast Transients/Bursts



## Surge Transients



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## Conducted Disturbance



## Voltage Dips and Short Interruptions

N/A

## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)

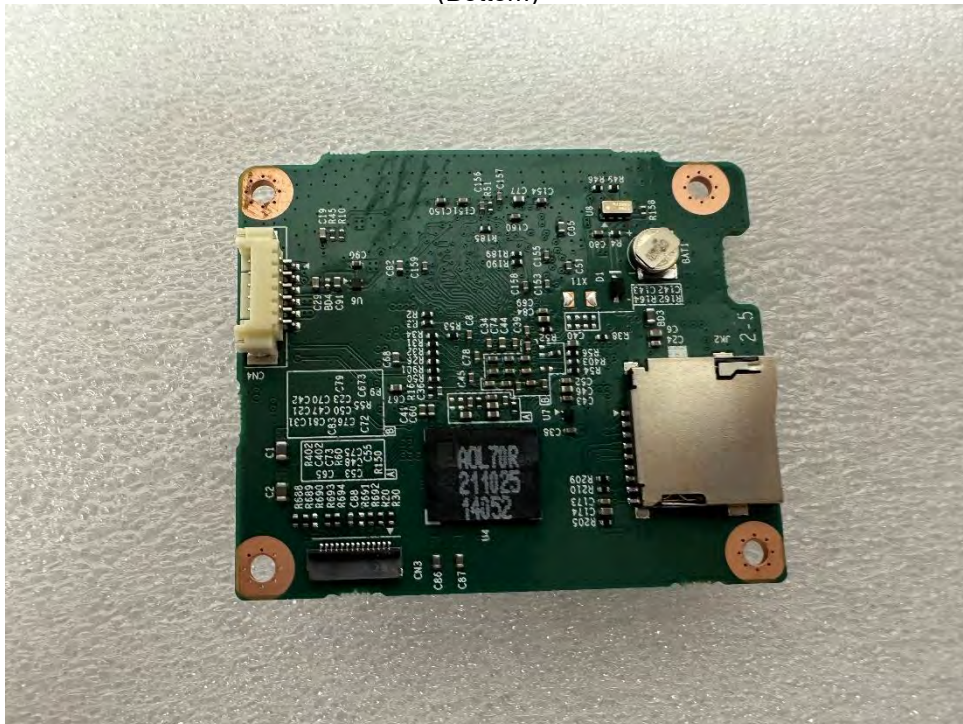


## EUT Internal View – Main Board 1

(Top)



(Bottom)



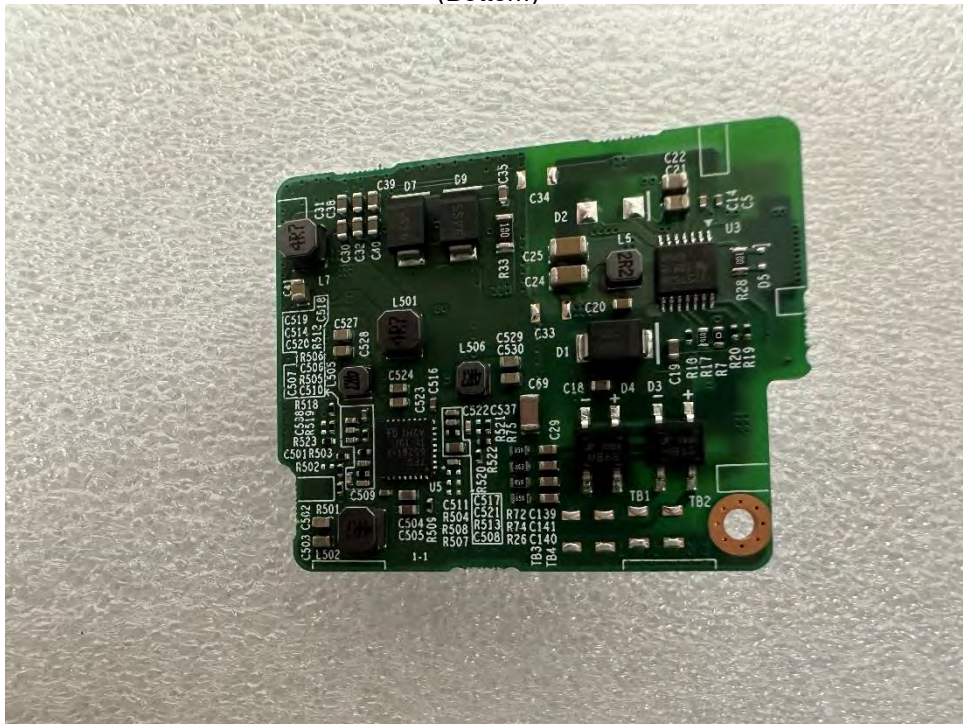
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## EUT Internal View – Main Board 2

(Top)



(Bottom)



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## EUT Internal View – LED Board

(Top)



(Bottom)



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## EUT Internal View – Camera Board

(Top)



(Bottom)



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## EUT Internal View – Camera Module

(Top)



(Bottom)



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## Label and Location

**NETWORK CAMERA**

Model No : ANO-L7022R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

