



## EMC TEST REPORT

Test Report No. : KES-E1-19T0655-R4  
Date of Issue : Feb. 24, 2023  
Product name : Network Camera  
Model/Type No. : PNV-A9081R  
Variant Model : PNV-A9081RLP, PNV-A9081ROP  
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 : Sep. 30, 2019  
Test date : Oct. 07, 2019 ~ Oct. 09, 2019  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Seong Min, Choi  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

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

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**REPORT REVISION HISTORY**

| Date          | Test Report No.   | Revision History                                                     |
|---------------|-------------------|----------------------------------------------------------------------|
| Oct. 21, 2019 | KES-E1-19T0655    | Issued                                                               |
| Dec. 10, 2020 | KES-E1-19T0655-R1 | Reissuance due to the addition of a derivative                       |
| Jul. 29, 2021 | KES-E1-19T0655-R2 | Specification update, reissue due to manufacturer deletion           |
| Jun. 09, 2022 | KES-E1-19T0655-R3 | Test regulation addition on customer request.                        |
| Feb. 24, 2023 | KES-E1-19T0655-R4 | Change the Applicant and manufacturer at the request of the customer |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |

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## 1.0 General Product Description

### Main Specifications of EUT are:

|                             |                                                                                                                                                                                                         |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Video</b>                |                                                                                                                                                                                                         |
| Imaging Device              | 1/1.8" CMOS                                                                                                                                                                                             |
| Resolution                  | 3840x2160, 3072x1728, 2592x1944, 2688x1520,<br>2560x1440, 2048x1536, 1920x1080, 1600x1200,<br>1280x1024, 1280x960, 1280x720, 1024x768,<br>800 x 600, 800 x 448, 720 x 576, 720x480, 640x480,<br>640x360 |
| Max. Framerate              | H.265/H.264: Max. 30fps/25fps(60Hz/50Hz)<br>MJPEG: Max. 30fps/25fps(60Hz/50Hz)                                                                                                                          |
| NETD                        | None                                                                                                                                                                                                    |
| Pixel Size                  | None                                                                                                                                                                                                    |
| Min. Illumination           | Color: 0.05Lux(F1.6, 1/30sec)<br>BW: 0.005Lux(F1.6, 1/30sec), 0Lux(IR LED on)                                                                                                                           |
| Video Out                   | CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N),<br>720x576(P) for installation<br>USB: Micro USB Type B, 1280x720 for installation                                                                          |
| Video Transmission Distance | None                                                                                                                                                                                                    |
| <b>Lens</b>                 |                                                                                                                                                                                                         |
| Focal Length (Zoom Ratio)   | 4.5~10mm(2.2x) motorized varifocal                                                                                                                                                                      |
| Max. Aperture Ratio         | F1.6(Wide)~F2.65(Tele)                                                                                                                                                                                  |
| Angular Field of View       | H:101.4°(Wide)~45.5°(Tele) /<br>V:53.6°(Wide)~25.5°(Tele) /<br>D:120.7°(Wide)~52.3°(Tele)                                                                                                               |
| Min. Object Distance        | 0.5m(1.64ft)                                                                                                                                                                                            |
| Focus Control               | Simple focus                                                                                                                                                                                            |
| Lens Type                   | DC auto iris, P iris                                                                                                                                                                                    |
| Mount Type                  | None                                                                                                                                                                                                    |
| Optional Lens               | None                                                                                                                                                                                                    |
| <b>Pan / Tilt / Rotate</b>  |                                                                                                                                                                                                         |
| Pan / Tilt / Rotate Range   | 0°~360° / -45°~85° / 0°~355°                                                                                                                                                                            |
| Pan Range                   | None                                                                                                                                                                                                    |
| Pan Speed                   | None                                                                                                                                                                                                    |

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|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, SSDR                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Wide Dynamic Range          | None                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Digital Noise Reduction     | SSNR V, WiseNR II(using AI engine)                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Digital Image Stabilization | Stabilization Support(built-in gyro sensor)                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Defog                       | None                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Motion Detection            | 8ea, polygonal zones                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Privacy Masking             | 6ea, rectangle zones<br>- Color: GrayBlack/White                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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)<br>Auto prefer shutter control based on AI engine                                                                                                                                                                                                                                                                                                                                                               |
| Digital PTZ                 | None                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Video Rotation              | Flip, Mirror, Hallway view(90°/270°)                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Analytics                   | - Classified object type : Person/Face/Vehicle/License plate with attributes, BestShot per object<br>- Analytics events based on AI engine : Object detection, <b>Face mask detection</b> , Directional detection, Digital auto tracking, Enter/Exit, Loitering, Virtual line, <b>Social distancing detection</b><br>- Analytics events : Defocus detection, Motion detection, Appear/Disappear, Tampering, Audio detection, Sound classification, Shock detection |
| Business Intelligence       | People counting, Queue management, Heatmap based                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|                           |                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | on AI engine                                                                                                                                                      |
| Serial Interface          | None                                                                                                                                                              |
| Alarm I/O                 | Input 1ea / Output 1ea / DC 12V Power(Max. 50mA)<br>1ea                                                                                                           |
| Alarm Triggers            | Analytics, Network disconnect, Alarm input                                                                                                                        |
| 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>Alarm output<br>Handover<br><b>Audio playback</b> |
| Audio In                  | Selectable(mic in/line in)<br>Supply voltage: 2.5VDC(4mA), Input impedance: 2K<br>Ohm                                                                             |
| Audio Out                 | Line out, Max.output level: 1Vrms                                                                                                                                 |
| IR Viewable Length        | 30m(98.42ft)                                                                                                                                                      |
| IR Illuminator (Optional) | 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                  | <b>Metal shielded RJ-45(10/100/1000 BASE-T)</b>                                                                                                                   |
| Video Compression         | H.265/H.264: Main/High, MJPEG                                                                                                                                     |
| Audio Compression         | G.711 u-law /G.726 Selectable<br>G.726(ADPCM) 8KHz, G.711 8KHz<br>G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps<br>AAC-LC: 48Kbps at 16KHz                                |
| Smart Codec               | Manual(5ea area), WiseStreamII, WiseStreamIII(using                                                                                                               |

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|                                       |                                                                                                                                                                                                                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | AI engine)                                                                                                                                                                                                              |
| Video Quality Adjustment              | H.264/H.265: Target bitrate level control<br>MJPEG: Target bitrate level control                                                                                                                                        |
| Bitrate Control                       | H.264/H.265: CBR or VBR<br>MJPEG: VBR                                                                                                                                                                                   |
| Streaming                             | <b>Unicast(6 users)</b> / Multicast<br>Multiple streaming(Up to 3 profiles)                                                                                                                                             |
| Protocol                              | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP),<br>RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP,<br>SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS,<br>DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP<br>Unicast) |
| Security                              | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access log<br>802.1X Authentication(EAP-TLS, EAP-LEAP)<br>Device Certificate(Hanwha Techwin Root CA)<br>Secure boot      |
| Application Programming<br>Interface  | ONVIF Profile S/G/T<br>SUNAPI(HTTP API)<br>Wisenet open platform                                                                                                                                                        |
| <b>General</b>                        |                                                                                                                                                                                                                         |
| Webpage Language                      | English, French, German, Spanish, Italian, Chinese,<br>Korean, Russian, Japanese,<br>Swedish, Portuguese, Czech, Polish, Turkish, Dutch,<br>Hungarian, Greek                                                            |
| Web Viewer                            | None                                                                                                                                                                                                                    |
| Edge Storage                          | Micro SD/SDHC/SDXC 2slots 512GB                                                                                                                                                                                         |
| Memory                                | 4096MB RAM, 512MB Flash                                                                                                                                                                                                 |
| <b>Environmental &amp; Electrical</b> |                                                                                                                                                                                                                         |
| Operating Temperature /<br>Humidity   | -50°C ~ +55°C(-58°F ~ +131°F) / Less than 90% RH<br>* Start up should be done at above -30°C                                                                                                                            |
| Storage Temperature / Humidity        | -50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH                                                                                                                                                                        |

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|-----------------------------------|-----------------------------------------------------------------------|
| Certification                     | IP66/IP67/IP6K9K, IK10+, NEMA4X                                       |
| Input Voltage                     | PoE+(IEEE802.3at), 12VDC                                              |
| Power Consumption                 | PoE+: Max 20.00W, typical 17.00W<br>12VDC: Max 18.70W, typical 15.00W |
| <b>Mechanical</b>                 |                                                                       |
| Color / Material                  | White / Aluminum                                                      |
| RAL Code                          | RAL9003                                                               |
| Product dimensions / weight       | Ø180x125mm(7.09x4.92"), Weight : 1.90Kg (4.19lb)                      |
| Compatible Conduit hole / Gangbox | 3/4"(M25)<br>Single, Double, 4"Octagon, Square                        |
| Hanging mount(Dome)               | SBP-187HMW                                                            |
| Skin cover(Dome)                  | SBC-180B                                                              |
| Weather cap(Dome)                 | None                                                                  |
| Power module                      | None                                                                  |
| Backbox                           | None                                                                  |
| <b>DORI (EN62676-4 standard)</b>  |                                                                       |
| Detect (25PPM/ 8PPF)              | Wide: 62.9m(206.34ft) / Tele: 183m(600.33ft)                          |
| Observe (63PPM/ 19PPF)            | Wide: 25.1m(82.34ft) / Tele: 73.3m(240.46ft)                          |
| Recognize (125PPM/ 38PPF)         | Wide: 12.6m(41.33ft) / Tele: 36.6m(120.07ft)                          |
| Identify (250PPM/ 76PPF)          | Wide: 6.3m(20.67ft) / Tele: 18.3m(60.03ft)                            |

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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.

Voltage ☐ 230 Vac ☐ 100 Vac ☐ 24 Vac ☒ 12 Vdc ☒ PoE  
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Addition of derivative model for distribution route classification

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                                | Remarks |
|----------------|--------------|---------------|---------------------------------------------|---------|
| Network Camera | PNV-A9081R   | -             | HANWHA VISION<br>VIETNAM COMPANY<br>LIMITED | EUT     |

## 1.5 Support Equipments

| Description      | Model Number            | Serial Number | Manufacturer                                     | Remarks |
|------------------|-------------------------|---------------|--------------------------------------------------|---------|
| PoE Adaptor      | PT-PSE109GBRO-AH        | EP06-003756A  | Dongguan PROCET<br>Network Technology<br>Co.,Ltd | -       |
| Notebook         | LG15N54                 | 410NZGK015231 | LG                                               | -       |
| Notebook Adaptor | ADP-90WH B              | 84ZW19F1663   | DELTA<br>ELECTRONICS(JIANGS<br>U) LTD.           | -       |
| Alarm In         | -                       | -             | -                                                | -       |
| Alarm Out        | SIP-1201DD D0           | -             | SAMSUNG TECHWIN<br>CO., LTD.                     | -       |
| Smart Phone      | SHV-E210L               | R33D713KA3F   | SAMSUNG                                          | -       |
| Speaker          | BR1000A Cuve<br>Black 2 | -             | DONGGUAN EDIFIER<br>TECHNOLOGY Co., Ltd          | -       |
| Micro SD Card    | -                       | -             | SAMSUNG                                          | 32 GB   |

## 1.6 External I/O Cabling

### ■ DC 12 V Mode

| Start                |                    | END           |          | Cable Spec. |        |
|----------------------|--------------------|---------------|----------|-------------|--------|
| Description          | I/O Port           | Description   | I/O Port | Length      | Shield |
| Network Camera (EUT) | RJ - 45            | Notebook      | RJ - 45  | 3.0         | U      |
|                      | 2 Pin              | Alarm In      | 2 Pin    | 3.0         | U      |
|                      | 2 Pin              | Alarm Out     | 2 Pin    | 3.0         | U      |
|                      | 3.5 m              | Smart Phone   | 3.5 m    | 0.3         | U      |
|                      | 3.5 m              | Speaker       | 3.5 m    | 1.4         | U      |
|                      | Micro SD Card Slot | Micro SD Card | -        | -           | -      |

\* Unshielded=U, Shielded=S

### ■ PoE Mode

| Start               |                    | END           |          | Cable Spec. |        |
|---------------------|--------------------|---------------|----------|-------------|--------|
| Description         | I/O Port           | Description   | I/O Port | Length      | Shield |
| Network Camer (EUT) | RJ - 45            | POE Adaptor   | RJ - 45  | 3.0         | U      |
|                     | 2 Pin              | Alarm 1       | 2 Pin    | 3.0         | U      |
|                     | 2 Pin              | Alarm 2       | 2 Pin    | 3.0         | U      |
|                     | 3.5 m              | Smart Phone   | 3.5 m    | 0.3         | U      |
|                     | 3.5 m              | Speaker       | 3.5 m    | 1.4         | U      |
|                     | Micro SD Card Slot | Micro SD Card | -        | -           | -      |
|                     | RJ - 45            | POE Adaptor   | RJ - 45  | 3.0         | U      |

\* Unshielded=U, Shielded=S

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## 1.7 EUT Operating Mode(s)

| Test Mode | operating                 |
|-----------|---------------------------|
| DC        | EUT Monitoring, Ping Test |
| POE       | EUT Monitoring, Ping Test |

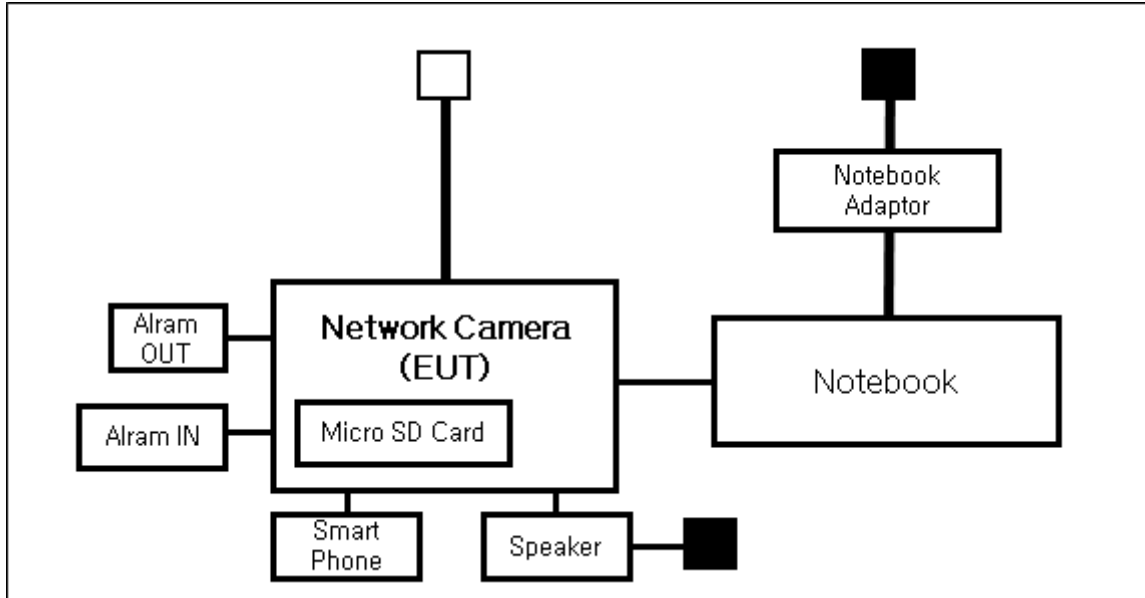
| EUT Test operating S/W |         |                        |
|------------------------|---------|------------------------|
| Name                   | Version | Manufacture Company    |
| Web Viewer             | -       | Hanwha Vision Co., Ltd |

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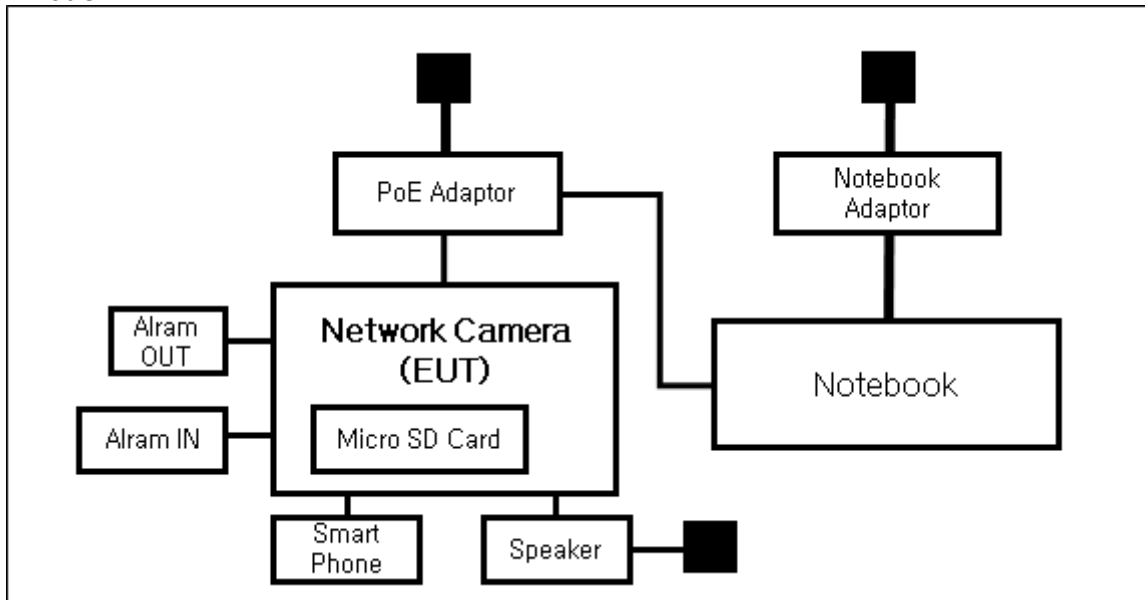
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC 12 V Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

N/A

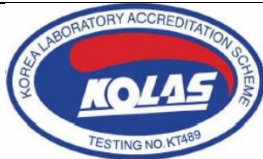
## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

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

## 1.12 Laboratory Accreditations and Listings

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

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013



## 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        | 101781        | 04, 22, 2020 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 04, 2020 |
| <input type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 22, 2020 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 26, 2019 |

### 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

DC and PoE are not tested apply. PoE is considered to be wired networks ports.



## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Oct. 07, 2019

### 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        | 101781        | 04, 22, 2020 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 04, 2020 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 22, 2020 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 26, 2019 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 01, 07, 2020 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 01, 07, 2020 |

### Test Conditions

Temperature: 23,9 °C  
Relative Humidity: 54,9 % 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.

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

**Test Date**

Oct. 07, 2019

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

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 04, 09, 2020 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 29, 2020 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 11, 2020 |

**Test Conditions**

Temperature: 24,0 °C

Relative Humidity: 53,4 % 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.

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

### Test Date

Oct. 07, 2019

### 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        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 05, 27, 2020 |
| <input type="checkbox"/>            | ATTENUATOR                 | 8491A        | HP               | 35496         | 03, 11, 2020 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 03, 12, 2021 |

### Test Conditions

Temperature: 24,1 °C  
Relative Humidity: 53,6 % 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   | 04, 09, 2020 |
| <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

N/A



## 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   | 04, 09, 2020 |
| <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

N/A

### 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 61000-4-2:2009

### Test Date

Oct. 09, 2019

### 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    | ESS05X4620    | 02, 22, 2020 |
| <input checked="" type="checkbox"/> | HCP           | -            | KES          | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | KES          | -             | -            |

### Test Conditions

Temperature: 22,9 °C  
Relative Humidity: 54,5 % R.H.  
Atmospheric Pressure: 100,3 kPa

### Test Specifications

Discharge Factor:  $\geq 1$  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

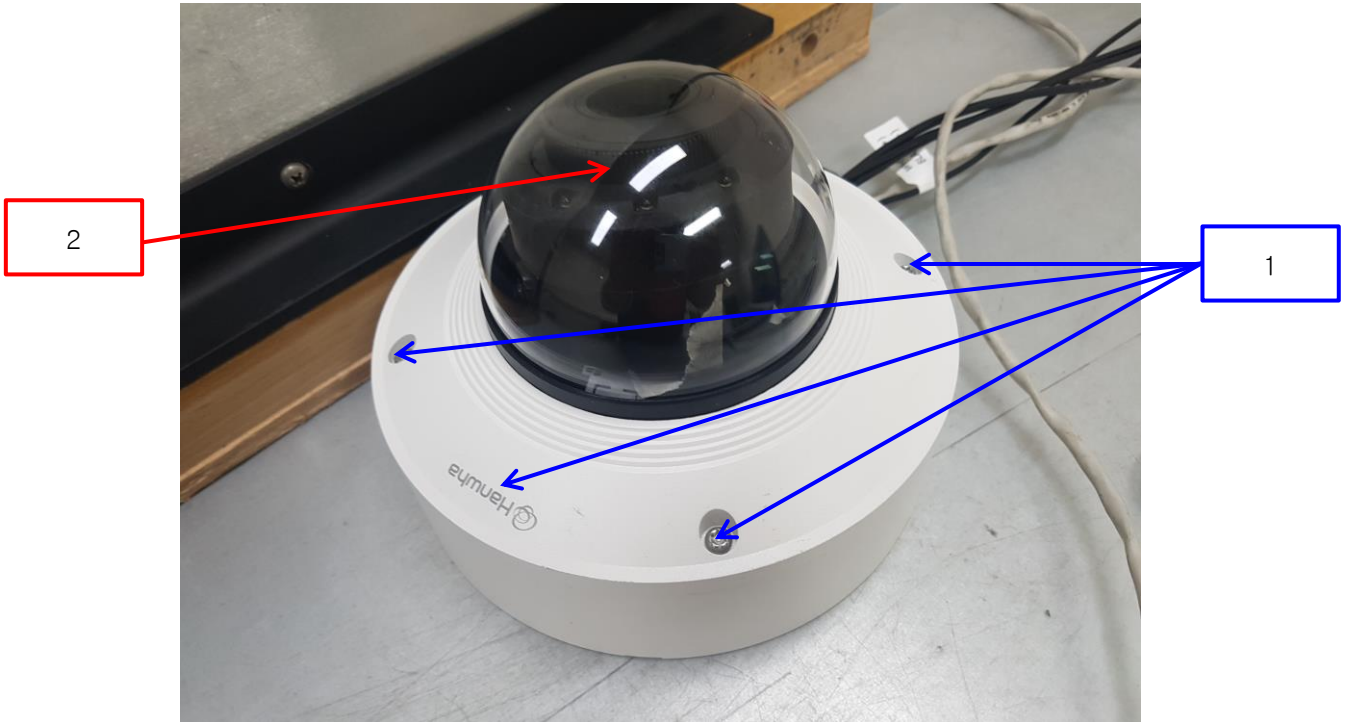
|                    |                                                                                                                                                                                                 |                                                                                    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

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

Required Performance Criteria: ☒ Complied

**Location of Discharge:**

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



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**Test Data**

## ■ DC 12 V Mode

## 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, Screw | Contact Discharge | Complied     | -       |
| 2   | Enclosure        | Air Discharge     | Complied     | -       |

## ■ PoE Mode

## 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, Screw | Contact Discharge | Complied     | -       |
| 2   | Enclosure        | 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

Oct. 08, 2019

### 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        | R & S          | 177586        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER             | BBA100          | R & S          | 101239        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER             | 100S1G6M1       | AR             | 579931        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | POWER METER                     | NRP2            | R & S          | 103475        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR                | NRP-Z91         | R & S          | 102526        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR                | NRP-Z91         | R & S          | 102527        | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | STACKED DOUBLE LOG-PER- ANTENNA | STPL9128 E      | Schwarzbeck    | 9128ES-121    | -            |
| <input checked="" type="checkbox"/> | DIRECTIONAL COUPLER             | KYDC-D1070-DX40 | KY TELECOM     | KY150001      | 08, 06, 2020 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA      | SAS-571         | A.H.SYSTEM,INC | 781           | 03, 12, 2021 |

### Test Conditions

Temperature: 24,3 °C  
Relative Humidity: 53,7 % R.H.  
Atmospheric Pressure: 100,6 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**

## ■ DC 12 V Mode

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

## ■ PoE Mode

| 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

Oct. 09, 2019

#### Test Location

EMS-EFT: Electro wave Shieldroom #3

#### Test Equipment

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | iec.control  | AMETEK CTS   | 7.1.2         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR   | UCS 500 N5   | EM TEST      | V0936105120   | 11, 27, 2019 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC              | MV2616       | EM TEST      | V0936105123   | 11, 27, 2019 |
| <input checked="" type="checkbox"/> | CAPACITIVE COUPLING CLAMP | HFK          | EM TEST      | 070925        | 11, 26, 2019 |

#### Test Conditions

Temperature: 24,9 °C  
Relative Humidity: 54,0 % R.H.  
Atmospheric Pressure: 100,4 kPa

#### Test Specifications

|                                                              |                                                                        |                                              |
|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------|
| Pulse Amplitude & Polarity:<br>(AC Power Lines)              | <input type="checkbox"/> ± 1.0 kV<br><input type="checkbox"/> ± 4.0 kV | <input type="checkbox"/> ± 2.0 kV            |
| Pulse Amplitude & Polarity:<br>(Other supply / Signal Lines) | <input type="checkbox"/> ± 0.5 kV<br><input type="checkbox"/> ± 2.0 kV | <input checked="" type="checkbox"/> ± 1.0 kV |
| Burst Period:                                                | <input checked="" type="checkbox"/> 300 ms                             | <input type="checkbox"/> 2 s                 |
| Repetition Rate:                                             | <input type="checkbox"/> 5 kHz                                         | <input checked="" type="checkbox"/> 100 kHz  |
| Duration of Test Voltage:                                    | <input checked="" type="checkbox"/> ≥ 1 min                            |                                              |
| Required Performance Criteria:                               | <input checked="" type="checkbox"/> Complied                           |                                              |

**Test Data**

## ■ DC 12 V Mode

☐ 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) |
| L1                  | Complied       | Complied       |
| L2                  | Complied       | Complied       |
| L1 – L2             | Complied       | Complied       |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm In            | Complied       | Complied       |
| Alarm Out           | Complied       | Complied       |

■ PoE Mode

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

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| L                   | -              | -              |
| N                   | -              | -              |
| PE                  | -              | -              |
| L – N               | -              | -              |
| L – PE              | -              | -              |
| N – PE              | -              | -              |
| L – N – PE          | -              | -              |

☐ 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               | Complied       | Complied       |
| Alarm In            | Complied       | Complied       |
| Alarm Out           | 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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### 3.4 Surge Transients

**Reference Standard**

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

**Test Date**

N/A

**Test Location**

EMS-EFT: 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      | 5.4.7         | -            |
| <input type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 26, 2019 |
| <input type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | P1552169719   | 11, 27, 2019 |
| <input type="checkbox"/> | CDN                     | CNV 508N1    | EM TEST      | P1610176296   | 11, 28, 2019 |

**Test Conditions**

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

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 | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☐ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria  
☒ NOT APPLICABLE

**Remarks**

N/A : Other supply/signal lines : No test is required because it is not permitted to connect cables > 30 m long.

### 3.5 Conducted Disturbance

#### Reference Standard

EN 61000-4-6:2014

#### Test Date

Oct. 08, 2019

#### 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      | 5.3.11        | -            |
| <input checked="" type="checkbox"/> | CONTINUOUS WAVE SIMULATOR | CWS 500N1.4  | EM TEST      | P1602169880   | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | ATTENUATOR                | ATT 6/80     | EM TEST      | P1614178148   | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | CDN                       | CDN M016     | TESEQ        | 43694         | 11, 26, 2019 |
| <input type="checkbox"/>            | CDN                       | CDN M016     | TESEQ        | 43697         | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | CDN                       | CDN T800     | TESEQ        | 42800         | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | EM CLAMP                  | KEMZ 801A    | TESEQ        | 44099         | 11, 27, 2019 |

#### Test Conditions

Temperature: 23,6 °C  
Relative Humidity: 54,4 % R.H.  
Atmospheric Pressure: 100,5 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

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**Test Data****■ DC 12 V Mode**☐ 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 |
|--------------------------------------|-----------------|--------------|
| L1 – L2                              | CDN             | Complied     |

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| RJ-45                                | CDN             | Complied     |
| Alarm In                             | Clamp           | Complied     |
| Alarm Out                            | Clamp           | Complied     |

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**■ PoE Mode**☐ 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                                | CDN             | Complied     |
| Alarm In                             | Clamp           | Complied     |
| Alarm Out                            | 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

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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      | 5.4.7         | -            |
| <input type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N7    | EM TEST      | P1608172950   | 11, 27, 2029 |
| <input type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | P1552169719   | 11, 27, 2029 |

#### 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

### Test Results

- ☐ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria  
☒ NOT APPLICABLE

### Remarks

N/A



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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

### ■ DC 12 V Mode

[1 000 Mbps]

### Common Information

Test Description:

Model No.:

Mode :

Speed :

Operator Name:

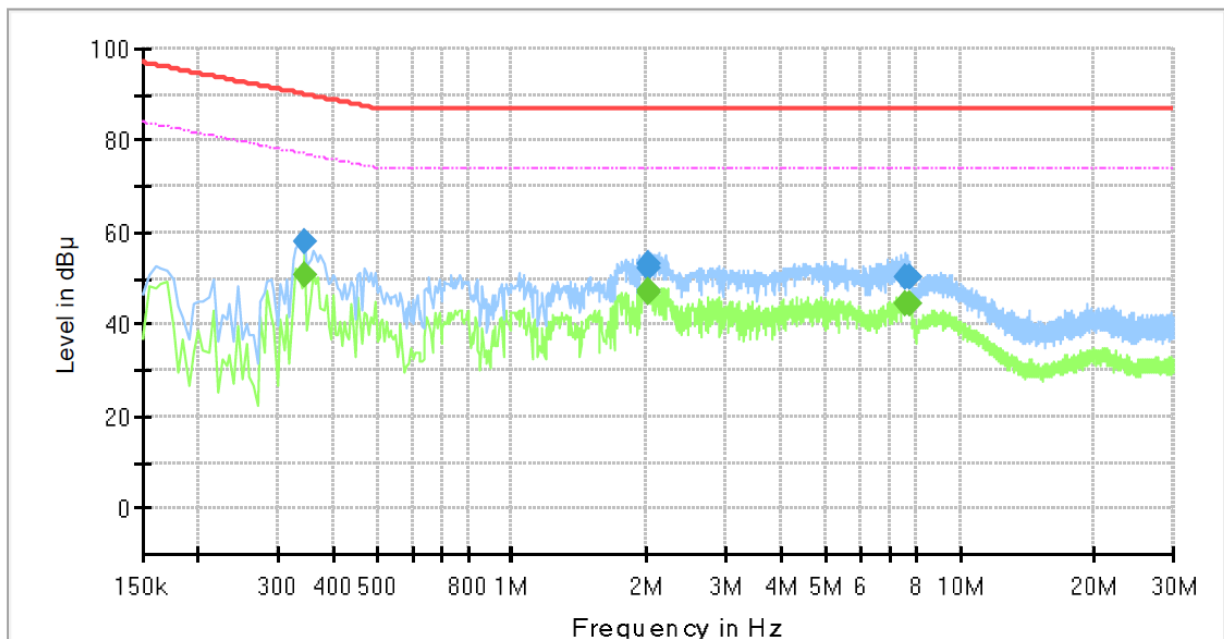
Telecommunication Emission

PNV-A9081R

DC 12 V

1000 Mbps

KES



## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.345000        | ---              | 50.66           | 77.08        | 26.42       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.345000        | 58.01            | ---             | 90.08        | 32.07       | 1000.0          | 9.000           | Single Line | 19.8       |
| 2.010000        | ---              | 46.85           | 74.00        | 27.15       | 1000.0          | 9.000           | Single Line | 20.3       |
| 2.010000        | 52.45            | ---             | 87.00        | 34.55       | 1000.0          | 9.000           | Single Line | 20.3       |
| 2.020000        | ---              | 47.36           | 74.00        | 26.64       | 1000.0          | 9.000           | Single Line | 20.3       |
| 2.020000        | 53.02            | ---             | 87.00        | 33.98       | 1000.0          | 9.000           | Single Line | 20.3       |
| 7.520000        | ---              | 44.62           | 74.00        | 29.38       | 1000.0          | 9.000           | Single Line | 19.8       |
| 7.520000        | 50.48            | ---             | 87.00        | 36.52       | 1000.0          | 9.000           | Single Line | 19.8       |
| 7.720000        | ---              | 44.60           | 74.00        | 29.40       | 1000.0          | 9.000           | Single Line | 19.8       |
| 7.720000        | 50.29            | ---             | 87.00        | 36.71       | 1000.0          | 9.000           | Single Line | 19.8       |

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**■ PoE Mode**
**[1 000 Mbps]**
**Common Information**

Test Description:

Telecommunication Emission

Model No.:

PNV-A9081R

Mode :

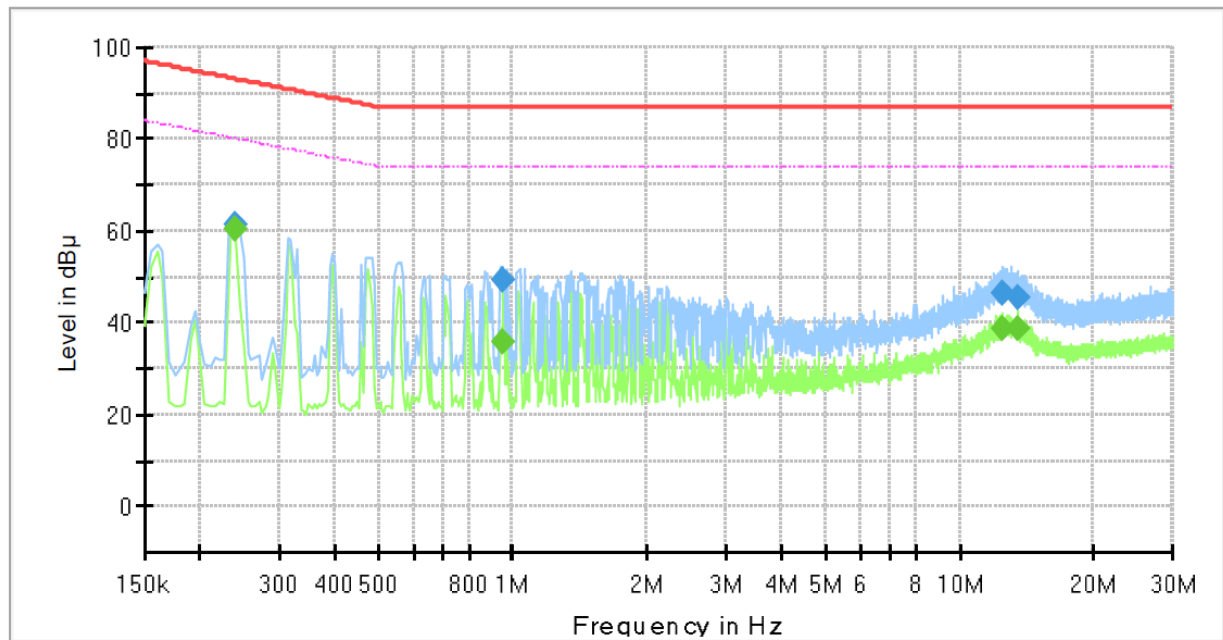
PoE

Speed :

1000 Mbps

Operator Name:

KES


**Final Result**

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.240000        | ---              | 60.34           | 80.10        | 19.76       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.240000        | 61.20            | ---             | 93.10        | 31.90       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.950000        | ---              | 35.89           | 74.00        | 38.11       | 1000.0          | 9.000           | Single Line | 20.2       |
| 0.950000        | 49.31            | ---             | 87.00        | 37.69       | 1000.0          | 9.000           | Single Line | 20.2       |
| 12.545000       | ---              | 38.88           | 74.00        | 35.12       | 1000.0          | 9.000           | Single Line | 19.8       |
| 12.545000       | 46.24            | ---             | 87.00        | 40.76       | 1000.0          | 9.000           | Single Line | 19.8       |
| 13.475000       | ---              | 38.70           | 74.00        | 35.30       | 1000.0          | 9.000           | Single Line | 19.9       |
| 13.475000       | 45.64            | ---             | 87.00        | 41.36       | 1000.0          | 9.000           | Single Line | 19.9       |

**◆ Calculation**

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

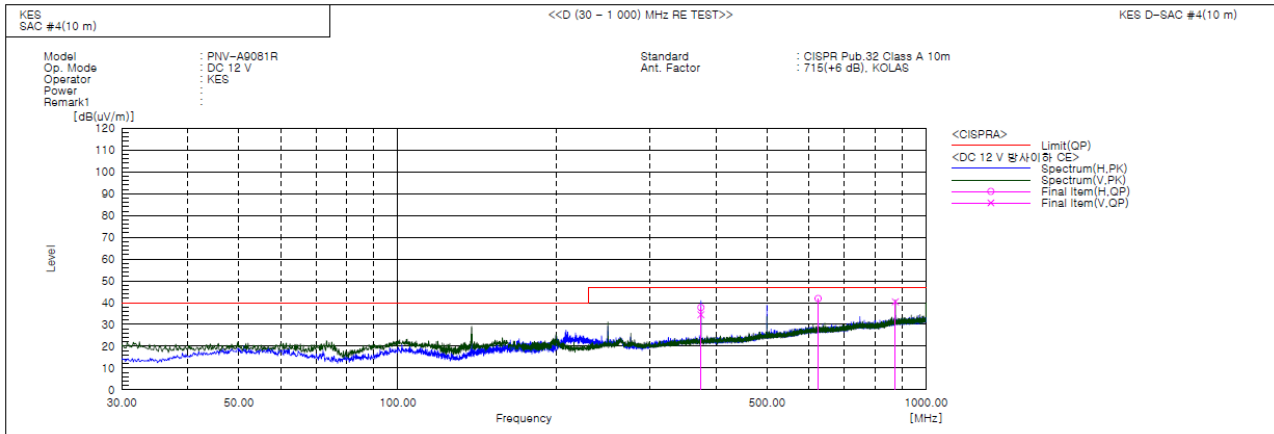
Reading Value : Not shown in the table.

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



## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC 12 V Mode



### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 374.956            | V   | 50.2                      | -15.7            | 34.5                       | 47.0                      | 12.5                 | 100.0          | 43.0           |        |
| 2   | 374.956            | H   | 53.5                      | -15.7            | 37.8                       | 47.0                      | 9.2                  | 177.0          | 359.0          |        |
| 3   | 624.974            | H   | 51.4                      | -9.5             | 41.9                       | 47.0                      | 5.1                  | 121.0          | 165.0          |        |
| 4   | 874.991            | V   | 46.4                      | -6.0             | 40.4                       | 47.0                      | 6.6                  | 148.0          | 222.0          |        |



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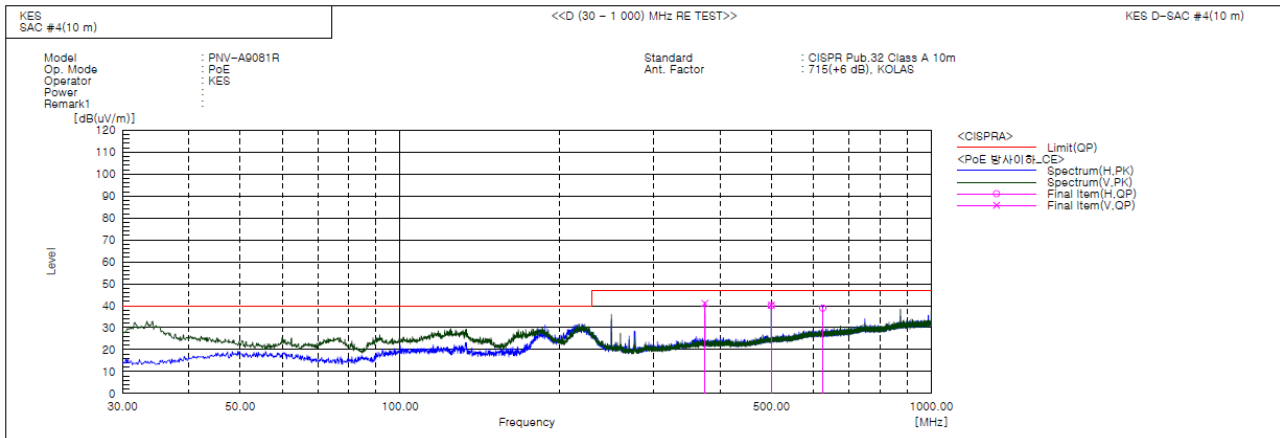
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### ■ PoE Mode



### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 374.956            | V   | 56.8                      | -15.7            | 41.1                       | 47.0                      | 5.9                  | 100.0          | 137.0          |        |
| 2   | 499.965            | V   | 53.0                      | -12.7            | 40.3                       | 47.0                      | 6.7                  | 345.0          | 63.0           |        |
| 3   | 499.965            | H   | 52.8                      | -12.7            | 40.1                       | 47.0                      | 6.9                  | 197.0          | 296.0          |        |
| 4   | 624.974            | H   | 48.4                      | -9.5             | 38.9                       | 47.0                      | 8.1                  | 246.0          | 58.0           |        |

### ◆ Calculation - SEMI ANECHOIC CHAMBER #4(10 m)

Result(QP) [dB( $\mu$ V/m)] = (Reading(QP)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB( $\mu$ V/m)] - Result(QP) [dB( $\mu$ V/m)]

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

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

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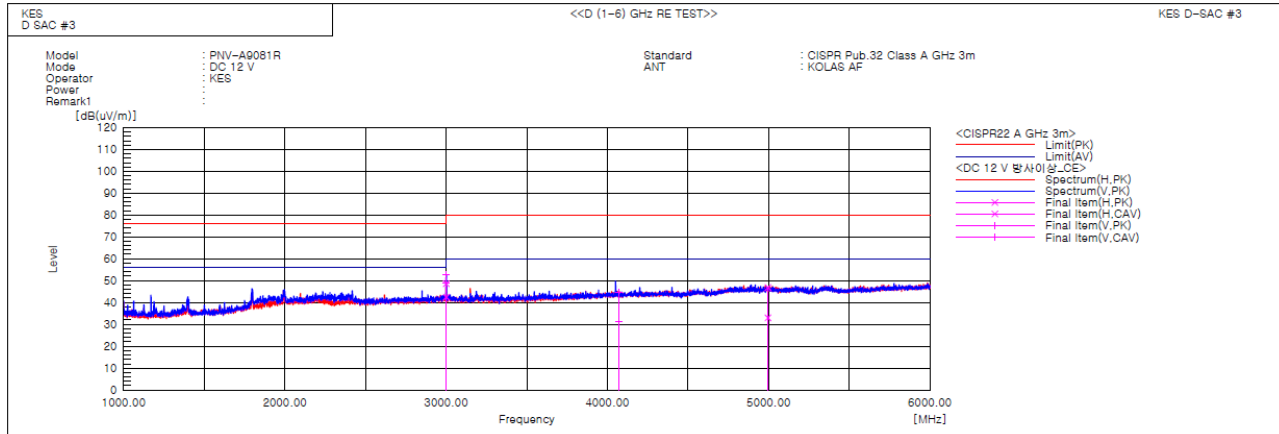
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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC 12 V Mode



#### 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   | 2999.850        | V   | 51.1                | 47.4                 | 1.5           | 52.6                 | 48.9                  | 76.0                | 56.0                | 23.4           | 7.1             | 100.0       | 344.1       |        |
| 2   | 2999.980        | H   | 47.2                | 40.9                 | 1.5           | 48.7                 | 42.4                  | 76.0                | 56.0                | 27.3           | 13.6            | 100.0       | 53.6        |        |
| 3   | 4068.427        | V   | 39.7                | 26.4                 | 4.9           | 44.6                 | 31.3                  | 80.0                | 60.0                | 35.4           | 28.7            | 100.0       | 72.3        |        |
| 4   | 4994.897        | H   | 38.6                | 24.9                 | 8.2           | 46.8                 | 33.1                  | 80.0                | 60.0                | 33.2           | 26.9            | 100.0       | 106.8       |        |



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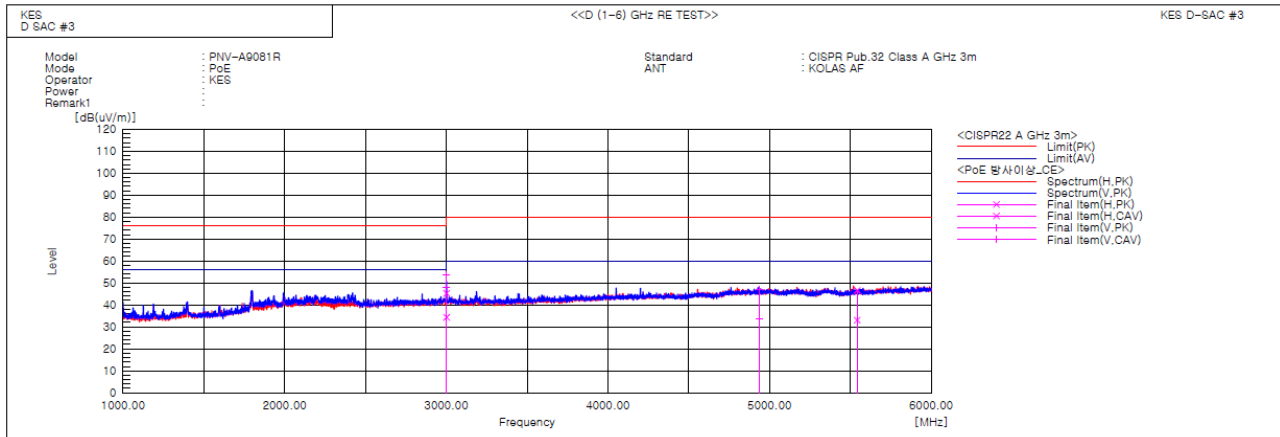
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### ■ PoE Mode



#### 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   | 3000.070        | V   | 52.2                | 46.5                 | 1.5           | 53.7                 | 48.0                  | 80.0                | 60.0                | 26.3           | 12.0            | 100.0       | 2.8         |        |
| 2   | 3000.700        | H   | 43.8                | 32.9                 | 1.5           | 45.3                 | 34.4                  | 80.0                | 60.0                | 34.7           | 25.6            | 100.0       | 58.3        |        |
| 3   | 4937.749        | V   | 39.1                | 25.7                 | 8.1           | 47.2                 | 33.8                  | 80.0                | 60.0                | 32.8           | 26.2            | 100.0       | 81.4        |        |
| 4   | 5541.256        | H   | 38.8                | 25.2                 | 7.9           | 46.7                 | 33.1                  | 80.0                | 60.0                | 33.3           | 26.9            | 100.0       | 205.8       |        |

### ◆ Calculation

Result(PK/CAV) [dB( $\mu$ V/m)] = (Reading(PK/CAV)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB( $\mu$ V/m)] - Result(PK/CAV) [dB( $\mu$ V/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:              |     |         |        |          |          |
| Limits:              |     |         |        |          |          |
| Results:             |     |         |        |          |          |

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## **Test Setup Photos and Configuration**

### **Conducted Voltage Emissions**

N/A

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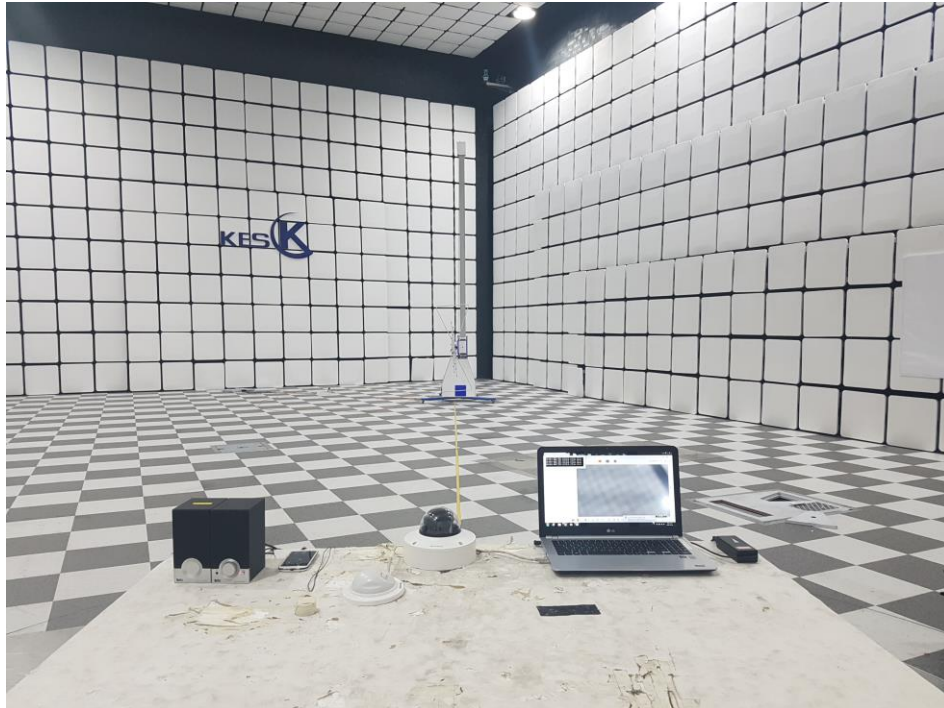
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## Conducted Telecommunication Emissions



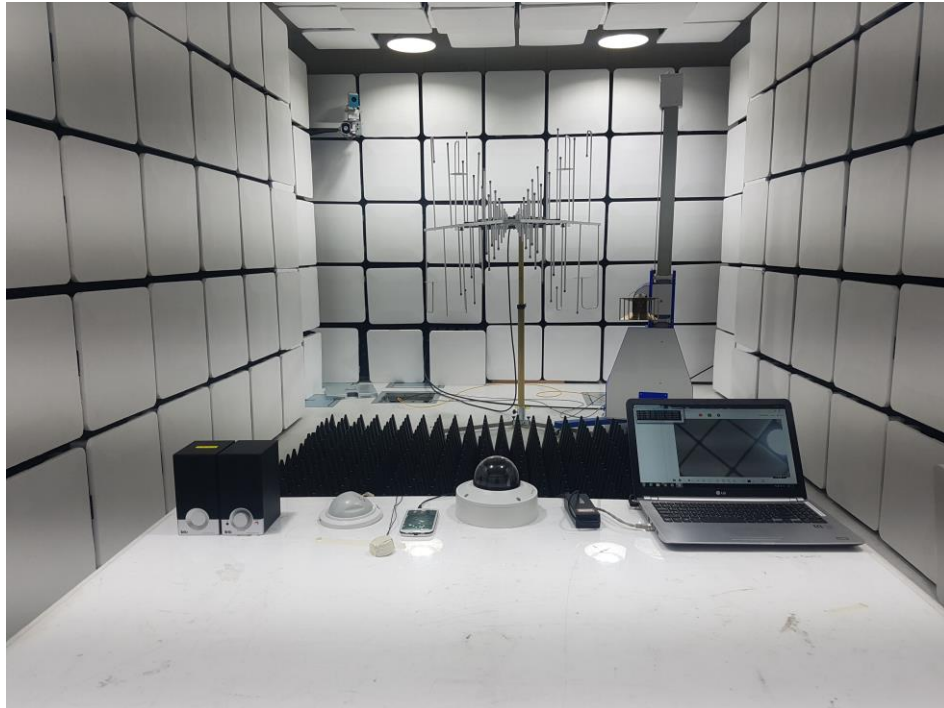
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## Radiated Electric Field Emissions(Below 1 GHz)



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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

N/A

## Conducted Disturbance



## Voltage Dips and Short Interruptions

N/A

## EUT External Photographs

(Top)



(Bottom)



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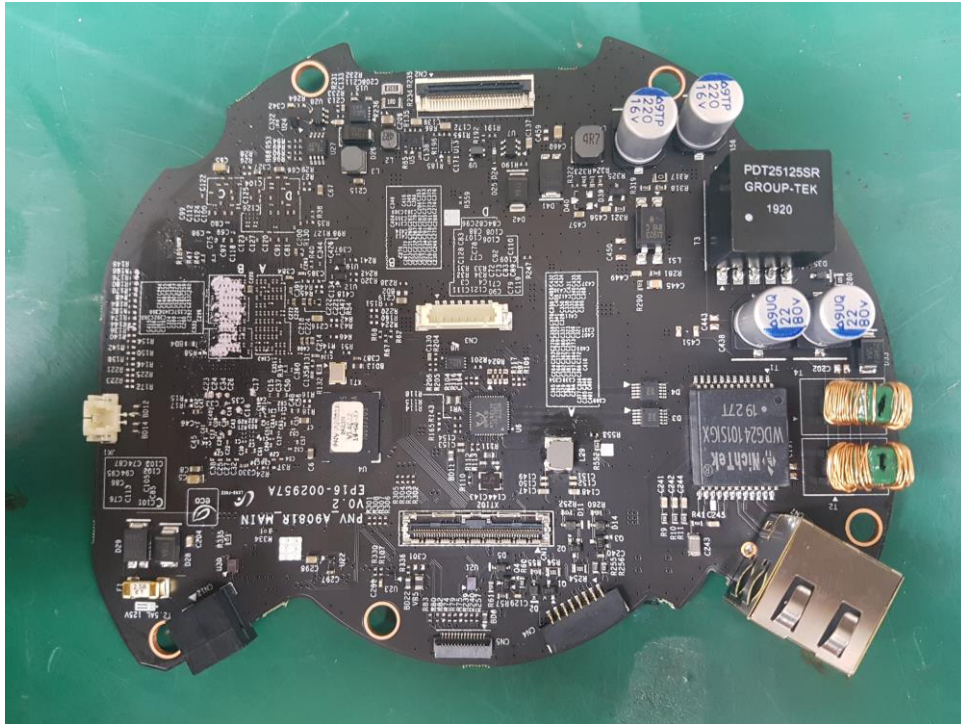
## EUT Internal Photographs

(Internal View)

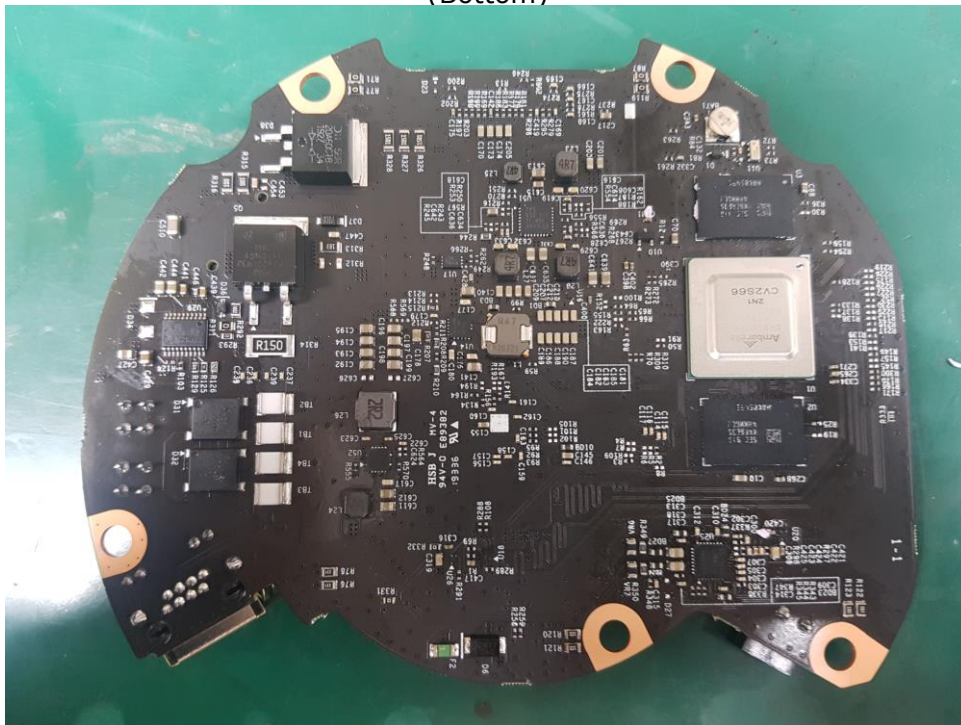


## EUT Internal View – Board 1

(Top)



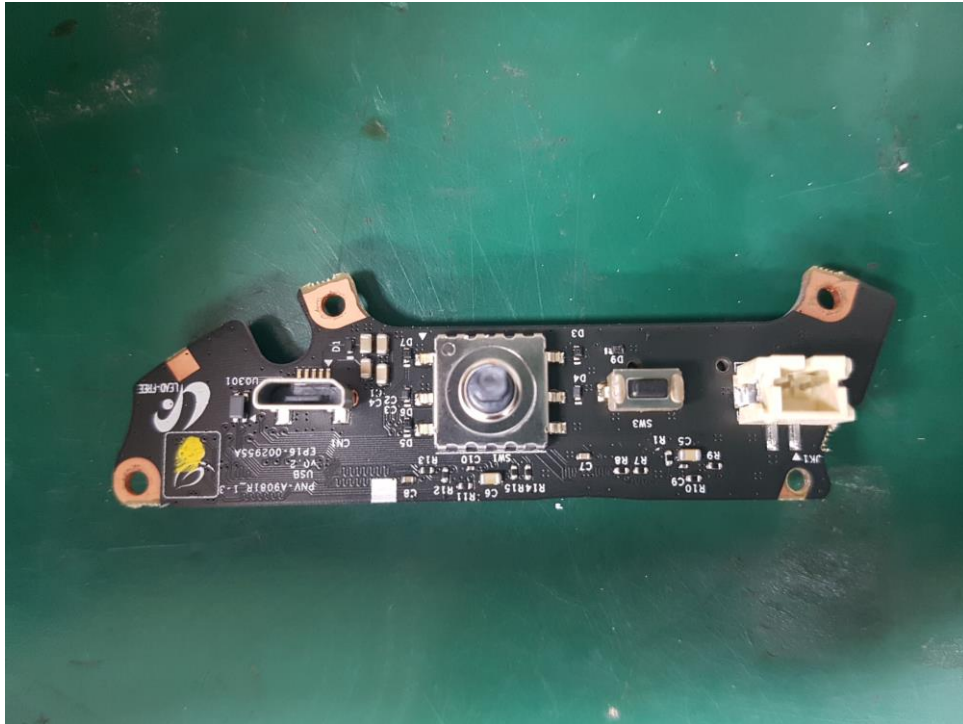
(Bottom)



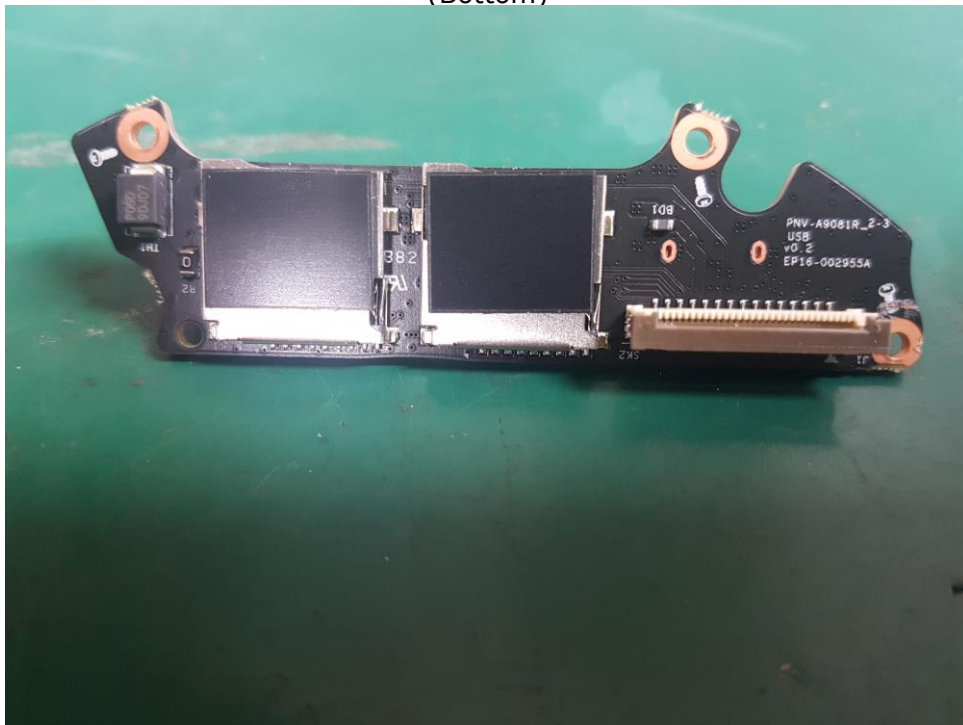
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## EUT Internal View – Board 2

(Top)



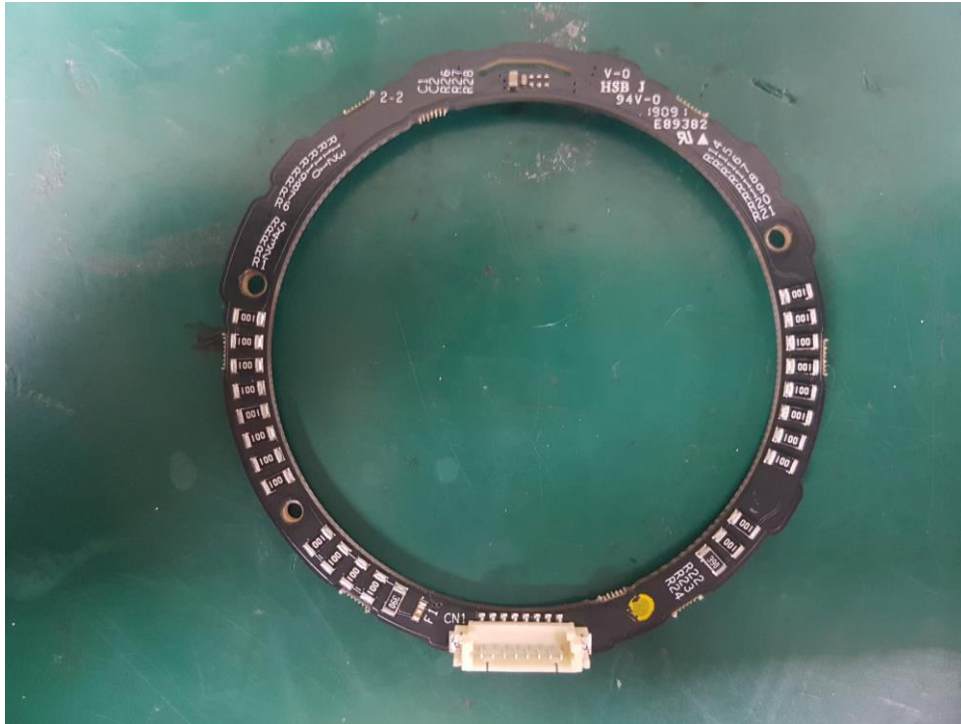
(Bottom)



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## EUT Internal View – sensor Board

(Top)

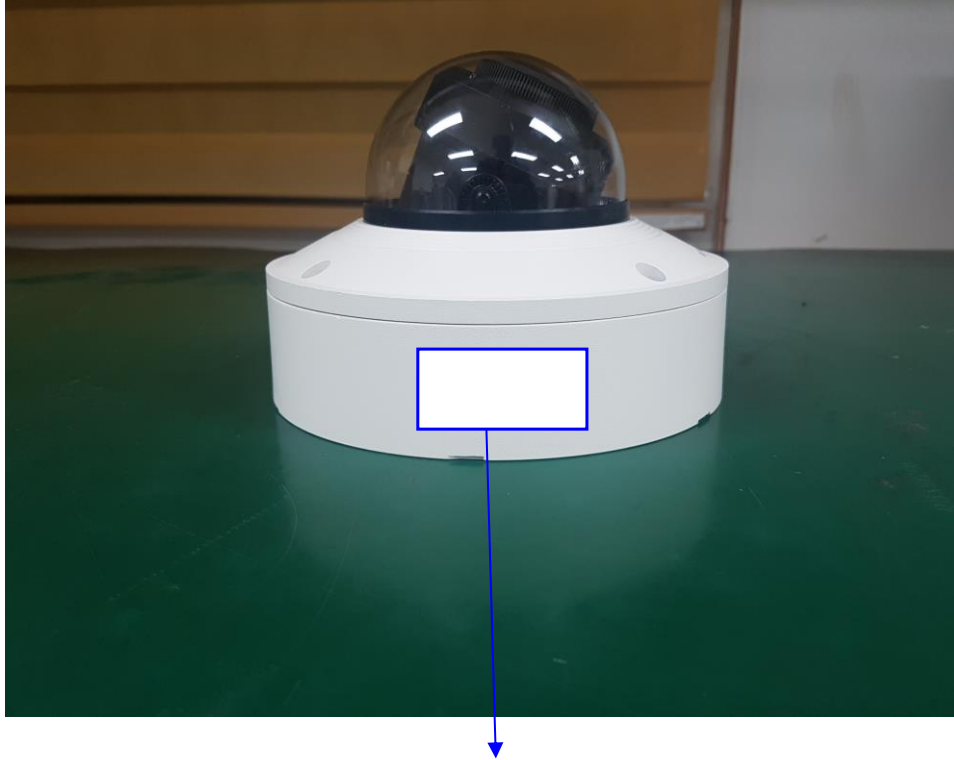


(Bottom)



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## Label and Location



### **Network Camera**

Model No : PNV-A9081R

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

