



# EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0336-R2

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA

Model/Type No. : QND-7080R

Variant Model : QND-7080RP, QND-7080RP/DM, QND-7080R/VDM

Applicant : Hanwha Techwin Co., Ltd.

Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, 13488, KOREA

Manufacturer : 1. Hanwha Techwin (Tianjin) Co.,Ltd.  
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.  
3. D-TECH CO.,LTD.

Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,  
300385, People's Republic of China  
2. Lot O-2, Que Vo Industrial Zone extended area,  
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam  
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do,  
Korea (Suwon Industrial Complex)

Date of Receipt : Jun. 16, 2016

Test date : Jun. 27, 2016 – Jul. 01, 2016

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KOLAS.

**KES Co., Ltd.**

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**REPORT REVISION HISTORY**

| Date          | Test Report No.   | Revision History                                                                                                       |
|---------------|-------------------|------------------------------------------------------------------------------------------------------------------------|
| Jul. 10, 2016 | KES-E1-16T0336    | Issued                                                                                                                 |
| Jun. 15, 2017 | KES-E1-16T0336-R1 | Reissue due to manufacturer change and additional derivative model                                                     |
| May. 15, 2019 | KES-E1-16T0336-R2 | Changed customer's address, factory addition, variant model addition and application standard due to customer request. |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |
|               |                   |                                                                                                                        |

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## 1.0 General Product Description

### Main Specifications of E.U.T are:

|                              | QND-7080R                                                                                                                                                                                                                                                                    |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Video</b>                 |                                                                                                                                                                                                                                                                              |
| Imaging Device               | 1/3" 4M CMOS                                                                                                                                                                                                                                                                 |
| Total Pixels                 | 2720x1536                                                                                                                                                                                                                                                                    |
| Effective Pixels             | 2688x1520                                                                                                                                                                                                                                                                    |
| Scanning System              | Progressive                                                                                                                                                                                                                                                                  |
| Min. Illumination            | Color : 0.15Lux, B/W : 0Lux                                                                                                                                                                                                                                                  |
| <b>Lens</b>                  |                                                                                                                                                                                                                                                                              |
| Focal Length (Zoom Ratio)    | Motorized 2.8~12mm                                                                                                                                                                                                                                                           |
| Max. Aperture Ratio          | F1.4                                                                                                                                                                                                                                                                         |
| Angular Field of View        | H 109.7°~26.0° / V 60.8°~15.2° / D 131.3°~30.1°                                                                                                                                                                                                                              |
| Min. Object Distance         | 0.5m                                                                                                                                                                                                                                                                         |
| Focus control                | Simple focus(Motorized V/F) / Manual, Remote control via network                                                                                                                                                                                                             |
| Lens Type                    | DC auto iris, P iris                                                                                                                                                                                                                                                         |
| Mount Type                   | Board type                                                                                                                                                                                                                                                                   |
| <b>Pan / Tilt / Rotate</b>   |                                                                                                                                                                                                                                                                              |
| Pan Range                    | 0~350°                                                                                                                                                                                                                                                                       |
| Tilt Range                   | 0~67°                                                                                                                                                                                                                                                                        |
| Rotate Range                 | 0~355°                                                                                                                                                                                                                                                                       |
| <b>Operational</b>           |                                                                                                                                                                                                                                                                              |
| IR Viewable Length           | 20m                                                                                                                                                                                                                                                                          |
| Camera Title                 | Off / On (Displayed up to 20 characters per line)<br>- W/W : English/Numeric/Special Characters<br>- China : English/Numeric/Special/Chinese Characters<br>- Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White),<br>Transparency, Auto Scale by Resolution |
| Day & Night                  | True Day & Night                                                                                                                                                                                                                                                             |
| Backlight Compensation       | Off / BLC                                                                                                                                                                                                                                                                    |
| Wide Dynamic Range           | 120dB                                                                                                                                                                                                                                                                        |
| Digital Noise Reduction      | SSNR(Off / On)                                                                                                                                                                                                                                                               |
| Motion Detection             | Off / On (4ea polygon zones)                                                                                                                                                                                                                                                 |
| Privacy Masking              | Off / On (6ea rectangular zones)                                                                                                                                                                                                                                             |
| Gain Control                 | Off / Low / Middle / High                                                                                                                                                                                                                                                    |
| White Balance                | ATW / AWC / Manual / Indoor / Outdoor                                                                                                                                                                                                                                        |
| LDC(Lens distortion control) | On/Off (5 levels with Min/Max)                                                                                                                                                                                                                                               |
| Electronic Shutter Speed     | Minimum / Maximum / Anti flicker                                                                                                                                                                                                                                             |
| Flip / Mirror                | Flip / Mirror / Hallway view                                                                                                                                                                                                                                                 |
| Intelligent Video Analytics  | Motion Detection with metadata, Tampering, Defocus                                                                                                                                                                                                                           |
| Alarm I/O                    | Input 1 / Output 1                                                                                                                                                                                                                                                           |
| Alarm Triggers               | Motion detection, Tampering Detection, SD card error, NAS error, Alarm input,<br>Defocus detection                                                                                                                                                                           |
| Alarm Events                 | File upload via FTP and E-Mail<br>Local storage recording at Event<br>Notification via E-Mail<br>External output                                                                                                                                                             |
| Pixel Counter                | Support ( plug-in viewer only )                                                                                                                                                                                                                                              |
| <b>Network</b>               |                                                                                                                                                                                                                                                                              |
| Ethernet                     | RJ-45 (10/100BASE-T)                                                                                                                                                                                                                                                         |
| Video Compression Format     | H.265, H.264, MJPEG                                                                                                                                                                                                                                                          |
| Resolution                   | 2592x1520, 2560x1440(16:9) / 2304x1296 / 1920x1080 / 1280x1024 / 1280x960 /<br>1280x720 / 1024x768 / 800x600 / 800x450 / 720x576 / 720x480 / 640x480 / 640x360 /<br>320x240                                                                                                  |
| Max. Framerate               | H.265 : Max 20fps at 4M, Max 30fps at 2M all resolutions<br>H.264 : Max 20fps at 4M, Max 30fps at 2M all resolutions<br>MJPEG : Max 5fps                                                                                                                                     |

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|                               |                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Smart codec                   | WiseStream                                                                                                                                                                                                                                                                                                                         |
| Video Quality Ajustment       | H.265 : Target Bitrate Level Control<br>H.264 : Target Bitrate Level Control<br>MJPEG : Quality Level Control                                                                                                                                                                                                                      |
| Bitrate control method        | H.265 : CBR or VBR<br>H.264 : CBR or VBR<br>MJPEG : VBR                                                                                                                                                                                                                                                                            |
| Streaming Capability          | Multiple Streaming(Up to 3 Profiles)                                                                                                                                                                                                                                                                                               |
| Audio I/O                     | Built-in MIC                                                                                                                                                                                                                                                                                                                       |
| Audio Compression Format      | G.711 u-law /G.726 Selectable<br>G.726(ADPCM) : 8KHz, G.711 : 8KHz<br>G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps                                                                                                                                                                                                                       |
| Audio Communication           | Uni-directional                                                                                                                                                                                                                                                                                                                    |
| IP                            | IPv4, IPv6                                                                                                                                                                                                                                                                                                                         |
| Protocol                      | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour                                                                                                                                                         |
| Security                      | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access Log<br>802.1X Authentication                                                                                                                                                                                                 |
| Streaming Method              | Unicast / Multicast                                                                                                                                                                                                                                                                                                                |
| Max. User Access              | 6 users at Unicast Mode                                                                                                                                                                                                                                                                                                            |
| Edge storage                  | Micro SD/SDHC/SDXC Max 128G, NAS<br>- Motion images recorded in the SD memory card can be downloaded<br>- Manual recording at Local PC                                                                                                                                                                                             |
| Application Programming Inter | ONVIF Profile S, G<br>SUNAPI(HTTP API)                                                                                                                                                                                                                                                                                             |
| Webpage Language              | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungary, Greek                                                                                                                                                                                  |
| Web Viewer                    | Supported OS: Windows 7, 8, 10, Mac OS X 10.8, 10.9, 10.10, 10.11<br>[Non-plugin Webviewer]<br>Supported Browser: Google Chrome 47, MS Edge 20<br>Support Codec : Video-H.264, MJPEG (Max. 1M 15fps), Audio-G.711<br>[Plug-in Webviewer]<br>Supported Browser : MS Explore 11 , Mozilla Firefox 43, Apple Safari 9 * Mac OS X only |
| Central Management Software   | SmartViewer                                                                                                                                                                                                                                                                                                                        |
| <b>Environmental</b>          |                                                                                                                                                                                                                                                                                                                                    |
| Operating Temperature / Humi  | -10°C ~ +55°C / Less than 90% RH                                                                                                                                                                                                                                                                                                   |
| Storage Temperature / Humidi  | -30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                                                  |
| Ingress Protection            | -                                                                                                                                                                                                                                                                                                                                  |
| Vandal Resistance             | -                                                                                                                                                                                                                                                                                                                                  |
| <b>Electrical</b>             |                                                                                                                                                                                                                                                                                                                                    |
| Input Voltage / Current       | PoE(IEEE802.3af, Class3), DC 12V                                                                                                                                                                                                                                                                                                   |
| Power Consumption             | Max.7.2W(PoE), Max.6.4W(DC12V)                                                                                                                                                                                                                                                                                                     |
| <b>Mechanical</b>             |                                                                                                                                                                                                                                                                                                                                    |
| Color / Material              | Ivory / Plastic                                                                                                                                                                                                                                                                                                                    |
| Dimension (WxHxD)             | φ119.8x98.8mm                                                                                                                                                                                                                                                                                                                      |
| Weight                        | 355g                                                                                                                                                                                                                                                                                                                               |

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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 ☐ 220 Vac ☐ 230 Vac ☐ 240 Vac ☒ PoE ☒ 12 Vdc  
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

| Variant Model  | Differences                        |
|----------------|------------------------------------|
| QND-7080RP     | Customer-specific management model |
| QND-7080RP/DM, |                                    |
| QND-7080R/VDM  |                                    |

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                      | Remarks |
|----------------|--------------|---------------|-----------------------------------|---------|
| NETWORK CAMERA | QND-7080R    | -             | Hanwha Techwin (Tianjin) Co.,Ltd. | E.U.T   |

## 1.5 Support Equipments

| Description   | Model Number | Serial Number                 | Manufacturer                               | Remarks |
|---------------|--------------|-------------------------------|--------------------------------------------|---------|
| Notebook      | NT63025J     | JK9091EF400432X               | Samsung Electronics Co., Ltd.              | -       |
| AC/DC ADAPTER | A13-040N2A   | CN60BA4400313AD<br>0N843KO243 | Chicony Power Technology (suzhou)Co., Ltd. | -       |
| PoE           | ANY4805C-LT1 | -                             | ANY ELECTRONICS CO., LTD.                  | -       |
| Alarm         | -            | -                             | -                                          | -       |

## 1.6 External I/O Cabling

- 12 V (dc) Mode

| Start                  |            | END         |            | Cable Spec. |        |
|------------------------|------------|-------------|------------|-------------|--------|
| Description            | I/O Port   | Description | I/O Port   | Length      | Shield |
| NETWORK CAMERA (E.U.T) | LAN(RJ-45) | Notebook    | LAN(RJ-45) | 5.0         | U      |
|                        | Alarm      | Alarm       | Alarm      | 3.0         | U      |

- PoE Mode

| Start                  |            | END         |            | Cable Spec. |        |
|------------------------|------------|-------------|------------|-------------|--------|
| Description            | I/O Port   | Description | I/O Port   | Length      | Shield |
| NETWORK CAMERA (E.U.T) | LAN(PoE)   | PoE         | LAN(PoE)   | 5.0         | U      |
|                        | Alarm      | Alarm       | Alarm      | 3.0         | U      |
| PoE                    | LAN(RJ-45) | Notebook    | LAN(RJ-45) | 4.0         | U      |

\* Unshielded=U, Shielded=S

## 1.7 E.U.T Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

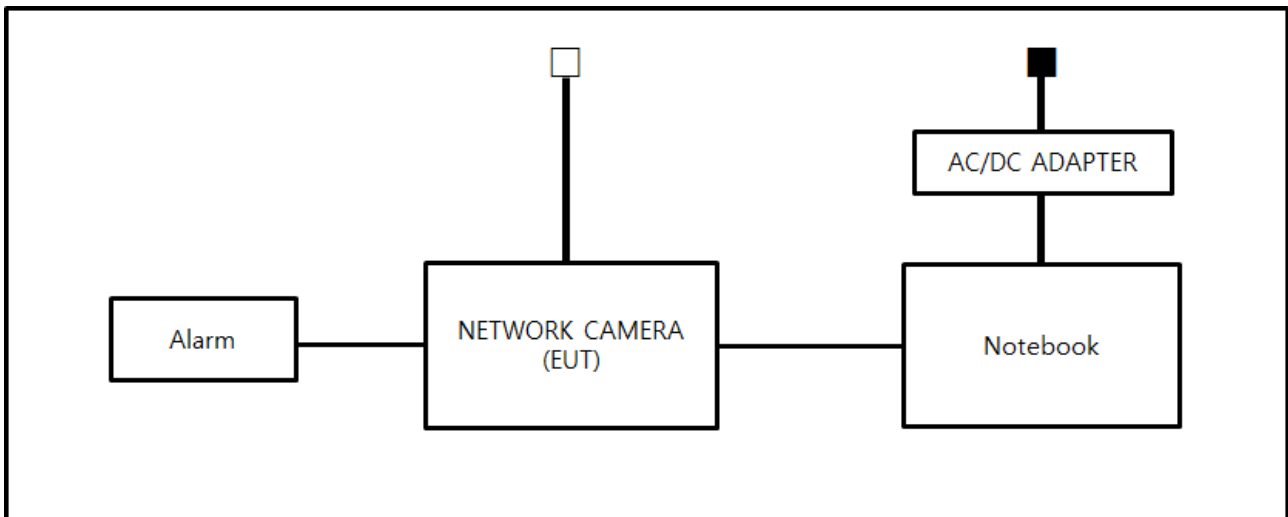
| Test mode | Normal operating                |
|-----------|---------------------------------|
| OP        | MONITORING<br>Network ping test |

- Input power condition during the measurements was 12 V (dc) , PoE

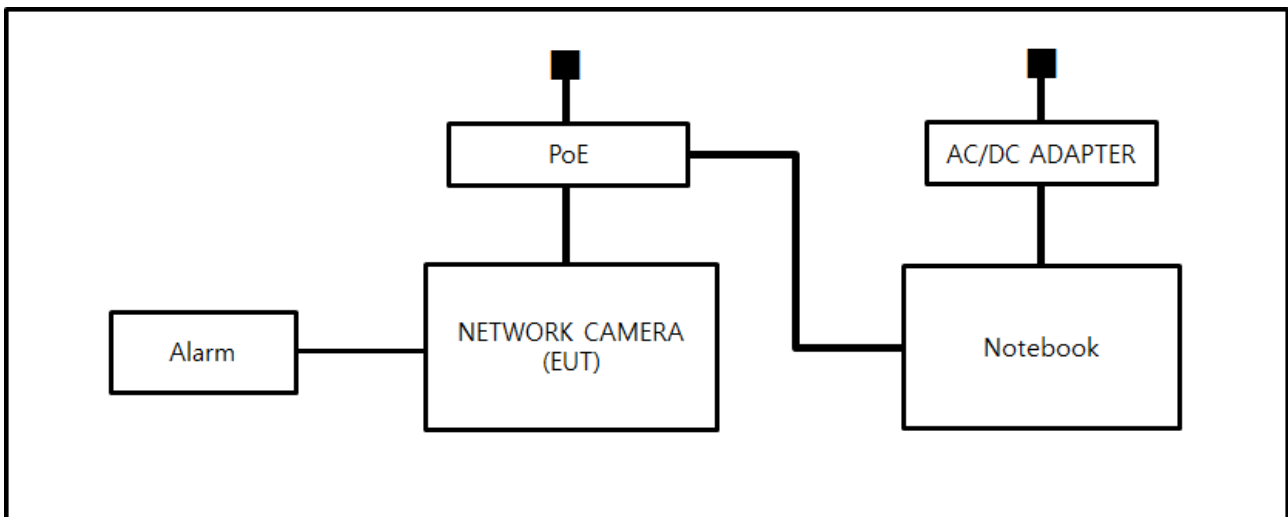
## 1.8 Configuration

■ AC Main  
 □ DC Main

- 12 V (dc) Mode



- PoE Mode



## 1.9 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.

## 1.10 Test Facility

The measurement facility is located at 473-29 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

## 1.11 Laboratory Accreditations and Listings

| Country       | Agency       | Scope of Accreditation                                                                                                                                                                                 | Logo                                                                                                                     |
|---------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| USA           | <b>FCC</b>   | 3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.                                                                                                       |                                       |
| JAPAN         | <b>VCCI</b>  | Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz         | <br>R-4308, C-4798,<br>T-2311, G-914 |
| KOREA         | <b>MSIP</b>  | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KR0100                          |
| Canada        | <b>IC</b>    | 3 & 10 meter Open Area Test Sites and one conducted site                                                                                                                                               | <br>4769B-1                         |
| Europe        | <b>CE</b>    | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) |                                     |
| International | <b>KOLAS</b> | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) |                                     |

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



- 
- |                                                               |                                  |                                  |
|---------------------------------------------------------------|----------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI V-3 / 2015.04</b>            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR22:2009 +A1:2010</b>  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>     |                                  |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010               | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2009                      |                                  |                                  |
| <input type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b> |                                  |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                      |                                  |                                  |
| <br>                                                          |                                  |                                  |
| <input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>      |                                  |                                  |
| <br>                                                          |                                  |                                  |
| <input type="checkbox"/> EN 301 489-1 V1.9.2                  |                                  |                                  |
| <input type="checkbox"/> Equipment for fixed use              |                                  |                                  |
| <input type="checkbox"/> Equipment for vehicular use          |                                  |                                  |
| <input type="checkbox"/> Equipment for portable use           |                                  |                                  |
| <input type="checkbox"/> EN 301 489-3 V1.6.1                  |                                  |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1                 |                                  |                                  |
| <input type="checkbox"/> EN 60945:2002                        |                                  |                                  |

## 2.1 Conducted Emissions at Mains Power Ports

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom

**Test Equipment**

| Used                     | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test Receiver       | ESR3         | R&S          | 101783        | 05, 03, 2017 |
| <input type="checkbox"/> | LISN                    | ENV216       | R&S          | 101137        | 02, 04, 2017 |
| <input type="checkbox"/> | LISN                    | ENV216       | R&S          | 101786        | 05, 02, 2017 |
| <input type="checkbox"/> | Electro wave Shieldroom | -            | SEMITEC      | -             | -            |

**Test Conditions**

Temperature: °C

Relative Humidity: %

**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**

Because the E.U.T power is 12 V (dc) power and PoE, limits are not specified.

## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**

Jun. 28, 2016

**Test Location**

Electro wave Shieldroom

**Test Equipment**

| Used                                | Description             | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test Receiver       | ESR3         | R&S              | 101783        | 05, 03, 2017 |
| <input checked="" type="checkbox"/> | LISN                    | ENV216       | R&S              | 101137        | 02, 04, 2017 |
| <input checked="" type="checkbox"/> | LISN                    | ENV216       | R&S              | 101786        | 05, 02, 2017 |
| <input checked="" type="checkbox"/> | 8-Wire ISN CAT3         | CAT3 8158    | Schwarzbeck Mess | 8158-0019     | 04, 01, 2017 |
| <input checked="" type="checkbox"/> | 8-Wire ISN CAT5         | CAT5 8158    | Schwarzbeck Mess | 8158-0030     | 04, 01, 2017 |
| <input type="checkbox"/>            | 8-Wire ISN CAT6         | NTFM 8158    | Schwarzbeck Mess | 8158-0029     | 08, 14, 2016 |
| <input checked="" type="checkbox"/> | Electro wave Shieldroom | -            | SEMITEC          | -             | -            |

**Test Conditions**

Temperature: 24,5 °C

Relative Humidity: 47,7 %

**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**

Jun. 27, 2016

**Test Location**☐ Open Area Test Site #1☒ Open Area Test Site #2**Test Equipment**

| Used                                | Description              | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test Receiver        | ESR3         | R&S          | 101781        | 05, 03, 2017 |
| <input checked="" type="checkbox"/> | Trilog-Broadband Antenna | VULB 9163    | SCHWARZBECK  | 9163-713      | 05, 15, 2017 |
| <input checked="" type="checkbox"/> | Open Area Test Site      | -            | KES          | -             | -            |
| <input checked="" type="checkbox"/> | Antenna Mast             | -            | DAEIL EMC    | -             | -            |
| <input checked="" type="checkbox"/> | Turn Table               | -            | DAEIL EMC    | -             | -            |

**Test Conditions**

Temperature: 30,5 °C

Relative Humidity: 43,0 %

**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**

Jun. 28, 2016

**Test Location**

Semi Anchoic Chamber #2

**Test Equipment**

| Used                                | Description                    | Model Number | Manufacturer                  | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------------|--------------|-------------------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test Receiver              | ESU26        | R&S                           | 100552        | 04, 24, 2017 |
| <input checked="" type="checkbox"/> | Broadband Coaxial Preamplifier | BBV 9718     | Schwarzbeck Mess - Elektronik | 9718-246      | 10, 23, 2016 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA     | SAS-571      | A.H.SYSTEM,INC                | 781           | 05, 07, 2017 |
| <input checked="" type="checkbox"/> | Semi Anchoic Chamber #2        | -            | SEMITEC                       | -             | -            |
| <input checked="" type="checkbox"/> | Antenna Mast                   | -            | AUDIX                         | -             | -            |
| <input checked="" type="checkbox"/> | Turn Table                     | -            | AUDIX                         | -             | -            |

**Test Conditions**

Temperature: 24,5 °C

Relative Humidity: 47,7 %

**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

### Test Equipment

| Used                     | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | AC Source              | ACS 500 N    | EM TEST      | V1024106760   | 08, 13, 2016 |
| <input type="checkbox"/> | Digital Power Analyzer | DPA 500 N    | EM TEST      | V1024106759   | 08, 13, 2016 |

### Test Conditions

Temperature: °C

Relative Humidity: %

### 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

Because the E.U.T power is less than 75 W, limits are not specified.



## 2.6 Voltage Fluctuations and Flicker

### Test Date

N/A

### Test Location

Electro wave Shieldroom

### Test Equipment

| Used                     | Description            | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | AC Source              | ACS 500 N    | EM test      | V1024106760   | 08, 13, 2016 |
| <input type="checkbox"/> | Digital Power Analyzer | DPA 500 N    | EM test      | V1024106759   | 08, 13, 2016 |

### Test Conditions

Temperature: °C

Relative Humidity: %

### Test Results

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

### Remarks

Because the E.U.T power is 12 V (dc) power and PoE.

### 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

Jun. 27, 2016

### Test Location

EMS-ESD: Electro wave Shieldroom

### Test Equipment

| Used                                | Description   | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | ESD SIMULATOR | ESS-2000     | Noise Ken    | ESS05X4620    | 02, 24, 2017 |
| <input checked="" type="checkbox"/> | HCP           | -            | Noise Ken    | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | Noise Ken    | -             | -            |

### Test Conditions

Temperature: 24,9 °C  
Relative Humidity: 42,1 %  
Atmospheric Pressure: 99,0 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 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

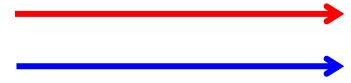
Notes: HCP: Horizontal coupling plane  
VCP: Vertical coupling plane

Required Performance Criteria:

☒ Complied

**Location of Discharge:**

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



- 12 V (dc) Mode



1. Air



2. Air

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- PoE Mode



1. Air



2. Air

**Test Data****- 12 V (dc) Mode****Indirect Discharge**

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

**Direct Discharge**

| No. | Test Point  | Discharge Method | Performance | Remarks |
|-----|-------------|------------------|-------------|---------|
|     |             |                  | Observation |         |
| 1   | Enclosure 1 | Air Discharge    | Complied    | -       |
| 2   | Enclosure 2 | Air Discharge    | Complied    | -       |

**- PoE Mode****Indirect Discharge**

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

**Direct Discharge**

| No. | Test Point  | Discharge Method | Performance | Remarks |
|-----|-------------|------------------|-------------|---------|
|     |             |                  | Observation |         |
| 1   | Enclosure 1 | Air Discharge    | Complied    | -       |
| 2   | Enclosure 2 | 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.



## 3.2 Radiated Electric Field Immunity

### Reference Standard

EN 61000-4-3:2006 +A2:2010

### Test Date

Jun. 29, 2016

### Test Location

EMS-RS: ☐ Semi Anchoic Chamber #1 ☒ Semi Anchoic Chamber #2

### Test Equipment

| Used                                | Description              | Model Number    | Manufacturer        | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|-----------------|---------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | SIGNAL GENERATOR         | SMB 100A        | R&S                 | 108252        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER      | BBA100          | R&S                 | 101239        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER      | 100S1G6M1       | AR                  | 579931        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | POWER METER              | NRP2            | R&S                 | 103475        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR         | NRP-Z91         | R&S                 | 102526        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR         | NRP-Z91         | R&S                 | 102527        | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | Stacked Log.-Per.Antenna | STLP 9128 D     | Schwarzbeck         | 9128D038      | -            |
| <input checked="" type="checkbox"/> | DIRECTIONAL COUPLER      | KYDC-D1070-DX40 | KyTelecom Co., Ltd. | KY150001      | 09, 25, 2016 |
| <input checked="" type="checkbox"/> | Semi Anchoic Chamber #2  |                 | SEMITEC             | -             | -            |

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**Test Conditions**

Temperature: 23,8 °C  
Relative Humidity: 49,2 %  
Atmospheric Pressure: 99,0 kPa

**Test Specifications**

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

**Test Data**

- 12 V (dc) Mode

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

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- PoE Mode

| Side Exposed | Observation |          |
|--------------|-------------|----------|
|              | 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**

Jun. 29, 2016

**Test Location**

EMS-EFT: Electro wave Shieldroom

**Test Equipment**

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | Ultra Compact Simulator   | UCS 500 N5   | EM TEST      | V0936105120   | 06, 27, 2017 |
| <input checked="" type="checkbox"/> | Capacitive Coupling Clamp | HFK          | EM TEST      | 070925        | 06, 27, 2017 |
| <input checked="" type="checkbox"/> | Motor Variac              | MV2616       | EM TEST      | V0936105123   | 06, 27, 2017 |

**Test Conditions**

Temperature: 23,9 °C  
Relative Humidity: 49,4 %  
Atmospheric Pressure: 99,0 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

- 12 V (dc) 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 – L2             | Complied       | Complied       |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | OBSERVATIONS   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| LAN(RJ-45)          | Complied       | Complied       |
| Alarm               | Complied       | Complied       |



- PoE 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) |
| -                   | -              | -              |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | OBSERVATIONS   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| LAN(PoE)            | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.

### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5:2014

**Test Date**

Jun. 30, 2016

**Test Location**

EMS-Surge: Electro wave Shieldroom

**Test Equipment**

| Used                                | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | Ultra Compact Simulator | UCS 500 N5   | EM TEST      | V0936105120   | 06, 27, 2017 |
| <input checked="" type="checkbox"/> | Motor Variac            | MV2616       | EM TEST      | V0936105123   | 06, 27, 2017 |
| <input type="checkbox"/>            | CDN                     | CNV 504N     | EM TEST      | V0936105121   | 03, 25, 2017 |
| <input checked="" type="checkbox"/> | CDN                     | CNV 508N1    | EM TEST      | P1551168979   | 04, 27, 2017 |
| <input type="checkbox"/>            | CDN                     | CNV 508T5    | EM TEST      | P1549168422   | 04, 27, 2017 |

**Test Conditions**

Temperature: 23,9 °C  
Relative Humidity: 49,4 %  
Atmospheric Pressure: 99,0 kPa

**Test Specifications**
**AC Power Lines**

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

Surge Amplitude :

Common Mode
☐ (0,5 / 1,0 / 2,0) kV

Differential Mode
☐ (0,5 / 1,0) kV

Number of Surges:

☐ 5 surges per angle

Angle:

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

Polarity:

☐ Positive & Negative

Repetition Rate:

☐ 1 surge per min    ☐ 1 surge per 30 sec.

Required Performance Criteria: ☐ Complied



**Other supply / Signal Lines**

Source Impedance: 42 ohm for common mode  
Surge Amplitude: Common Mode  
☒ (0,5 / 1,0) kV  
  
Number of Surges: ☒ 5 Surges  
  
Polarity: ☒ Positive & Negative  
  
Repetition Rate: ☒ 1 surge per min    ☐ 1 surge per 30 sec.  
  
Required Performance Criteria: ☒ Complied

**Test Data**

- 12 V (dc) Mode

☐ 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) |
| LAN(RJ-45)          | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

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**- PoE Mode**☐ 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) |
| LAN(PoE)            | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.



## 3.5 Conducted Disturbance

### Reference Standard

EN 61000-4-6:2014

### Test Date

Jul. 01, 2016

### Test Location

EMS-CS: Electro wave Shieldroom

### Test Equipment

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | Continuous Wave Generator | CWS 500N1    | EM TEST      | V0936105119   | 09, 25, 2016 |
| <input checked="" type="checkbox"/> | 6dB Attenuator            | ATT6         | EM TEST      | 1208-34       | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | CDN                       | CDN-M2/M3N   | EM TEST      | 0909-06       | 08, 13, 2016 |
| <input type="checkbox"/>            | CDN                       | CDN-T2-RJ11  | EM TEST      | 0909-07       | 08, 13, 2016 |
| <input type="checkbox"/>            | CDN                       | CDN-T4       | EM TEST      | 0909-08       | 08, 13, 2016 |
| <input type="checkbox"/>            | CDN                       | CDN-T8RJ45   | EM TEST      | 0909-09       | 08, 13, 2016 |
| <input type="checkbox"/>            | CDN                       | CDN-AF2      | EM TEST      | 0909-10       | 08, 13, 2016 |
| <input type="checkbox"/>            | CDN                       | CDN-AF4      | EM TEST      | 0909-11       | 08, 13, 2016 |
| <input checked="" type="checkbox"/> | EM Injection Clamp        | EM 101       | Liithi       | 35943         | 02, 04, 2017 |

### Test Conditions

Temperature: 23,7 °C  
Relative Humidity: 53,4 %  
Atmospheric Pressure: 99,7 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

**Test Data**

- 12 V (dc) Mode

☐ Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method                                                 | Observation |
|--------------------------------------|-----------------------------------------------------------------|-------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | -           |

☒ Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method                                                            | Observation |
|--------------------------------------|----------------------------------------------------------------------------|-------------|
| L1 – L2                              | CDN ( <input checked="" type="checkbox"/> M2, <input type="checkbox"/> M3) | Complied    |

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method    | Observation |
|--------------------------------------|--------------------|-------------|
| LAN(RJ-45)                           | EM Injection Clamp | Complied    |
| Alarm                                | EM Injection Clamp | Complied    |

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**- PoE Mode**☐ Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method                                                 | Observation |
|--------------------------------------|-----------------------------------------------------------------|-------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | -           |

☐ Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method                                                 | Observation |
|--------------------------------------|-----------------------------------------------------------------|-------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | -           |

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method    | Observation |
|--------------------------------------|--------------------|-------------|
| LAN(PoE)                             | EM Injection Clamp | Complied    |
| Alarm                                | EM Injection Clamp | Complied    |

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

**Observations:**

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.



### 3.6 Voltage Dips and Short Interruptions

#### Reference Standard

EN 61000-4-11:2004

#### Test Date

N/A

#### Test Location

EMS-Voltage dip: Electro wave Shieldroom

#### Test Equipment

| Used                     | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | Ultra Compact Simulator | UCS 500 N5   | EM TEST      | V0936105120   | 06, 27, 2017 |
| <input type="checkbox"/> | Motor Variac            | MV2616       | EM TEST      | V0936105123   | 06, 27, 2017 |

#### Test Conditions

Temperature: °C  
Relative Humidity: %  
Atmospheric Pressure: kPa



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### Test Specifications & Observations/Remarks

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

#### - Voltage variations

|                                      |                                       |       |
|--------------------------------------|---------------------------------------|-------|
| <input type="checkbox"/> Unom + 10 % | <input type="checkbox"/> 253 V (ac)   | _____ |
| <input type="checkbox"/> Unom - 15 % | <input type="checkbox"/> 195.5 V (ac) | _____ |

Observations:  
Complied – No degradation of function

#### Test Results

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

#### Remarks

NOT APPLICABLE

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## **APPENDIX A – TEST DATA**

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

**[HOT]**

N/A



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**[NEUTRAL]**

N/A

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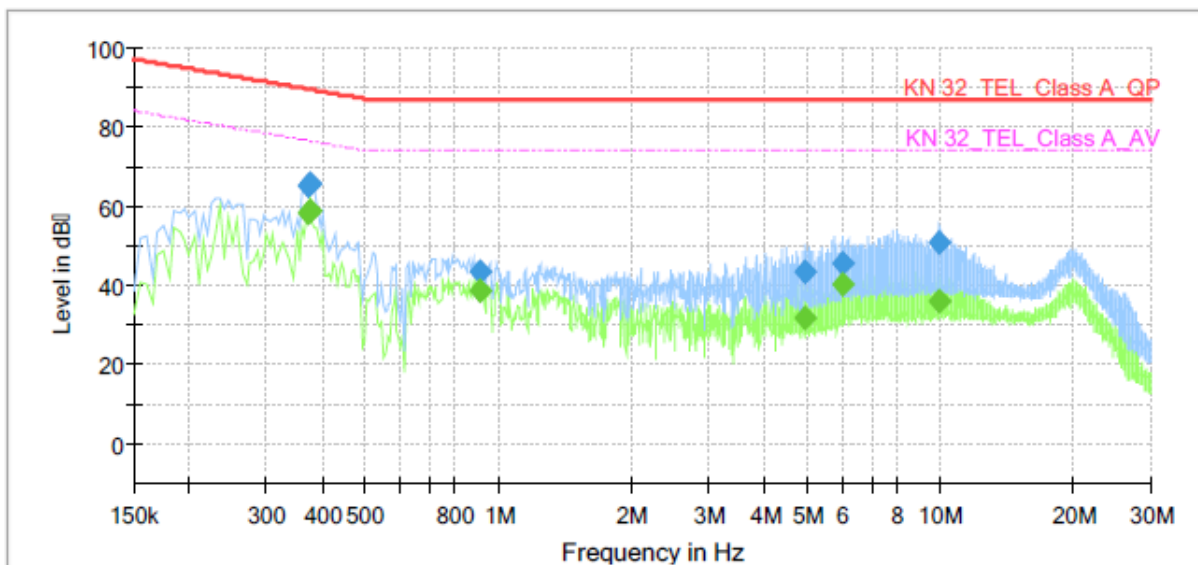
## Conducted Emissions at Telecommunication Ports

- 12 V (dc) Mode

[10 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Model No.: QND-7080RP  
Mode: 12 V (dc) , 10 Mbps  
Operator Name: KES



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.370000        | ---              | 58.41           | 76.50        | 18.09       | 1000.0          | 9.000           | Single Line | 10.0       |
| 0.370000        | 65.05            | ---             | 89.50        | 24.45       | 1000.0          | 9.000           | Single Line | 10.0       |
| 0.375000        | ---              | 58.50           | 76.39        | 17.89       | 1000.0          | 9.000           | Single Line | 10.0       |
| 0.375000        | 65.51            | ---             | 89.39        | 23.88       | 1000.0          | 9.000           | Single Line | 10.0       |
| 0.905000        | ---              | 38.76           | 74.00        | 35.24       | 1000.0          | 9.000           | Single Line | 9.9        |
| 0.905000        | 43.37            | ---             | 87.00        | 43.63       | 1000.0          | 9.000           | Single Line | 9.9        |
| 4.935000        | ---              | 31.88           | 74.00        | 42.12       | 1000.0          | 9.000           | Single Line | 9.9        |
| 4.935000        | 43.39            | ---             | 87.00        | 43.61       | 1000.0          | 9.000           | Single Line | 9.9        |
| 6.050000        | ---              | 40.07           | 74.00        | 33.93       | 1000.0          | 9.000           | Single Line | 9.9        |
| 6.050000        | 45.65            | ---             | 87.00        | 41.35       | 1000.0          | 9.000           | Single Line | 9.9        |
| 10.005000       | ---              | 35.87           | 74.00        | 38.13       | 1000.0          | 9.000           | Single Line | 10.1       |
| 10.005000       | 50.91            | ---             | 87.00        | 36.09       | 1000.0          | 9.000           | Single Line | 10.1       |

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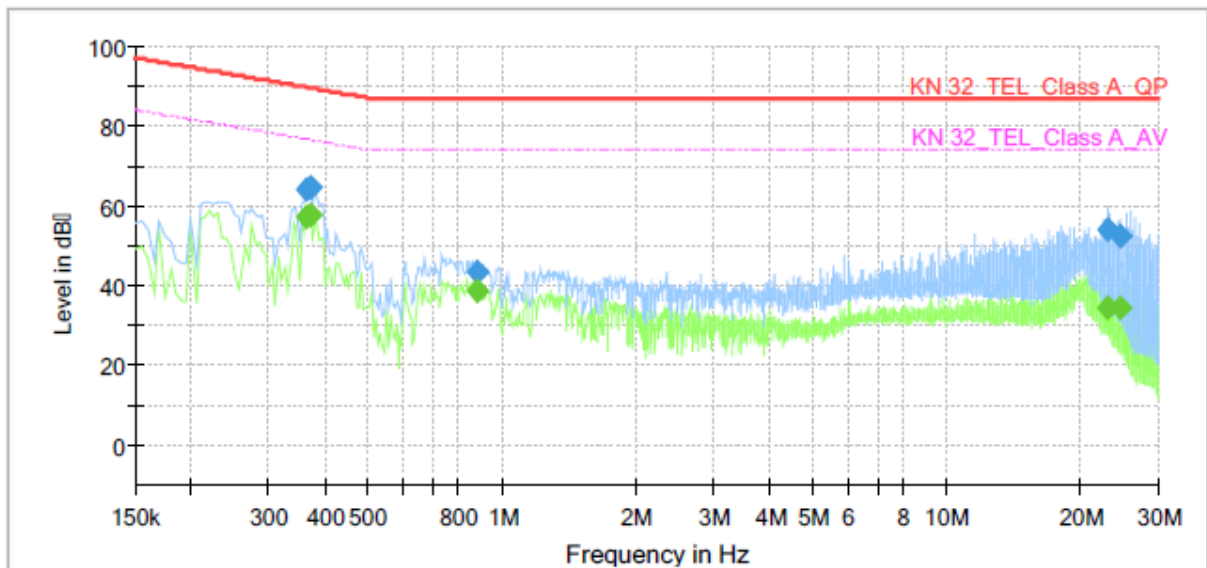
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[100 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Model No.: QND-7080RP  
Mode: 12 V (dc) , 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.365000        | ---              | 57.36           | 76.61        | 19.25       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.365000        | 63.81            | ---             | 89.61        | 25.80       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.370000        | ---              | 57.69           | 76.50        | 18.81       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.370000        | 64.36            | ---             | 89.50        | 25.14       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.885000        | ---              | 38.78           | 74.00        | 35.22       | 1000.0          | 9.000           | Single Line | 9.4        |
| 0.885000        | 43.38            | ---             | 87.00        | 43.62       | 1000.0          | 9.000           | Single Line | 9.4        |
| 23.130000       | ---              | 34.28           | 74.00        | 39.72       | 1000.0          | 9.000           | Single Line | 9.5        |
| 23.130000       | 53.90            | ---             | 87.00        | 33.10       | 1000.0          | 9.000           | Single Line | 9.5        |
| 24.550000       | ---              | 34.19           | 74.00        | 39.81       | 1000.0          | 9.000           | Single Line | 9.4        |
| 24.550000       | 52.27            | ---             | 87.00        | 34.73       | 1000.0          | 9.000           | Single Line | 9.4        |

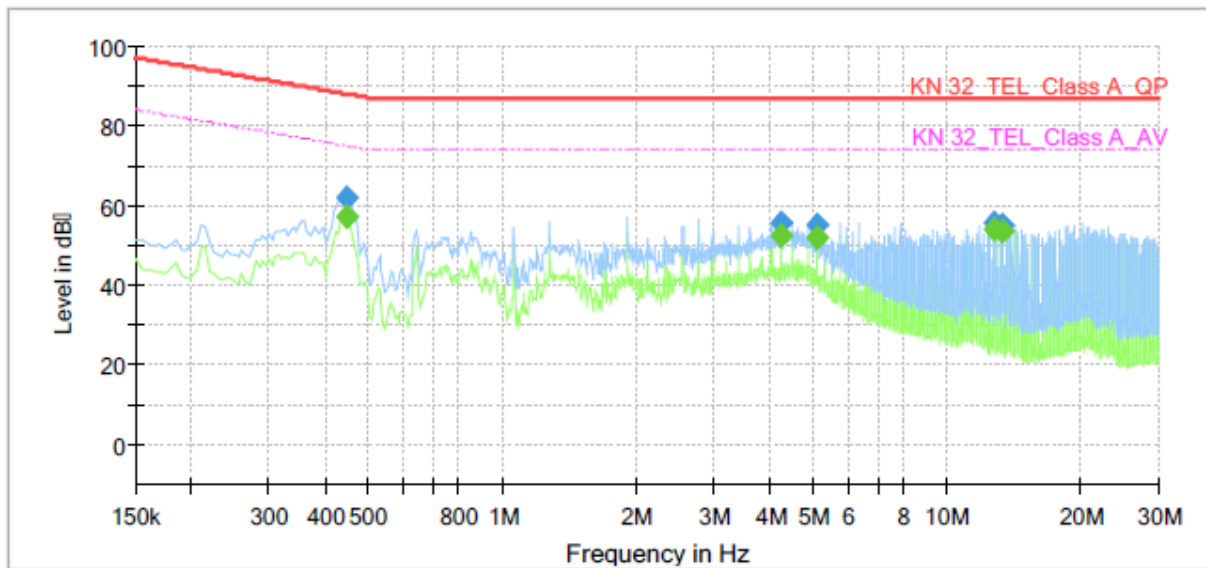
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- PoE Mode

**[10 Mbps]**

## Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | QND-7080RP                 |
| Mode              | PoE , 10 Mbps              |
| Operator Name:    | KES                        |



## Final Result

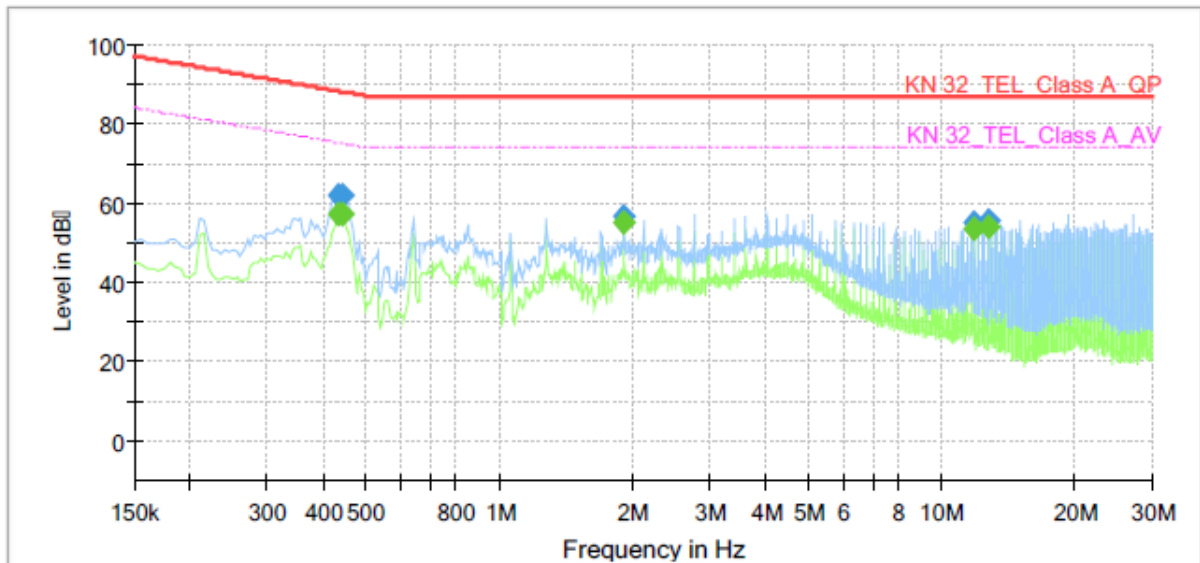
| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | CAverage (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------------|-----------------------|--------------------|-------------|-----------------|-----------------|-------------|------------|
| 0.445000        | ---                    | 57.24                 | 74.97              | 17.73       | 1000.0          | 9.000           | Single Line | 10.0       |
| 0.445000        | 61.90                  | ---                   | 87.97              | 26.07       | 1000.0          | 9.000           | Single Line | 10.0       |
| 4.255000        | ---                    | 52.34                 | 74.00              | 21.66       | 1000.0          | 9.000           | Single Line | 9.8        |
| 4.255000        | 55.61                  | ---                   | 87.00              | 31.39       | 1000.0          | 9.000           | Single Line | 9.8        |
| 5.105000        | ---                    | 52.05                 | 74.00              | 21.95       | 1000.0          | 9.000           | Single Line | 9.9        |
| 5.105000        | 55.31                  | ---                   | 87.00              | 31.69       | 1000.0          | 9.000           | Single Line | 9.9        |
| 12.760000       | ---                    | 53.95                 | 74.00              | 20.05       | 1000.0          | 9.000           | Single Line | 10.1       |
| 12.760000       | 55.43                  | ---                   | 87.00              | 31.57       | 1000.0          | 9.000           | Single Line | 10.1       |
| 13.400000       | ---                    | 53.70                 | 74.00              | 20.30       | 1000.0          | 9.000           | Single Line | 10.1       |
| 13.400000       | 55.05                  | ---                   | 87.00              | 31.95       | 1000.0          | 9.000           | Single Line | 10.1       |

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## [100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | QND-7080RP                 |
| Mode              | PoE , 100 Mbps             |
| Operator Name:    | KES                        |



### Final Result

| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | CAverage (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------------|-----------------------|--------------------|-------------|-----------------|-----------------|-------------|------------|
| 0.435000        | ---                    | 57.12                 | 75.16              | 18.04       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.435000        | 61.81                  | ---                   | 88.16              | 26.35       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.440000        | ---                    | 57.34                 | 75.06              | 17.72       | 1000.0          | 9.000           | Single Line | 9.5        |
| 0.440000        | 61.93                  | ---                   | 88.06              | 26.13       | 1000.0          | 9.000           | Single Line | 9.5        |
| 1.915000        | ---                    | 54.80                 | 74.00              | 19.20       | 1000.0          | 9.000           | Single Line | 9.3        |
| 1.915000        | 56.80                  | ---                   | 87.00              | 30.20       | 1000.0          | 9.000           | Single Line | 9.3        |
| 11.910000       | ---                    | 53.26                 | 74.00              | 20.74       | 1000.0          | 9.000           | Single Line | 9.6        |
| 11.910000       | 54.96                  | ---                   | 87.00              | 32.04       | 1000.0          | 9.000           | Single Line | 9.6        |
| 12.760000       | ---                    | 53.82                 | 74.00              | 20.18       | 1000.0          | 9.000           | Single Line | 9.6        |
| 12.760000       | 55.50                  | ---                   | 87.00              | 31.50       | 1000.0          | 9.000           | Single Line | 9.6        |



## Radiated Electric Field Emissions(Below 1 GHz)

- 12 V (dc) Mode

| Frequency | Amplitude    | ANT<br>Polar. | ANT.<br>Height | Correction Factor |               | Corrected<br>Amplitude | Applicable<br>Limit | Margin |
|-----------|--------------|---------------|----------------|-------------------|---------------|------------------------|---------------------|--------|
| [MHz]     | [dB $\mu$ V] | (H/V)         | [m]            | ANT.<br>[dB/m]    | Cable<br>[dB] | [dB $\mu$ V/m]         | [dB $\mu$ V/m]      | [dB]   |
| 148.51    | 12.84        | V             | 1.05           | 8.15              | 2.76          | 23.75                  | 40.00               | 16.25  |
| 216.01    | 8.91         | H             | 4.00           | 11.66             | 3.44          | 24.01                  | 40.00               | 15.99  |
| 375.00    | 13.46        | H             | 3.86           | 15.12             | 4.85          | 33.43                  | 47.00               | 13.57  |
| 455.99    | 14.51        | V             | 1.00           | 16.48             | 5.44          | 36.43                  | 47.00               | 10.57  |
| 456.00    | 8.14         | H             | 3.91           | 16.48             | 5.44          | 30.06                  | 47.00               | 16.94  |
| 504.00    | 11.02        | V             | 1.00           | 17.19             | 5.77          | 33.98                  | 47.00               | 13.02  |
| 504.02    | 7.31         | H             | 3.45           | 17.19             | 5.77          | 30.27                  | 47.00               | 16.73  |

\* H : Horizontal, V : Vertical

- PoE Mode

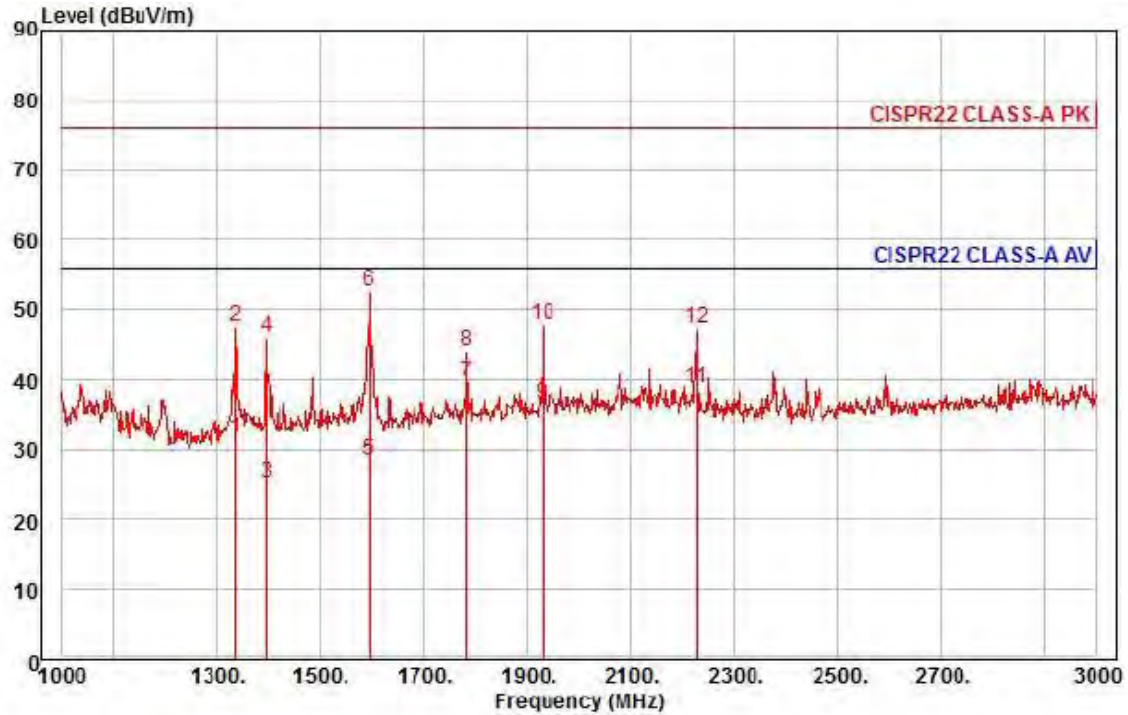
| Frequency | Amplitude    | ANT<br>Polar. | ANT.<br>Height | Correction Factor |               | Corrected<br>Amplitude | Applicable<br>Limit | Margin |
|-----------|--------------|---------------|----------------|-------------------|---------------|------------------------|---------------------|--------|
| [MHz]     | [dB $\mu$ V] | (H/V)         | [m]            | ANT.<br>[dB/m]    | Cable<br>[dB] | [dB $\mu$ V/m]         | [dB $\mu$ V/m]      | [dB]   |
| 49.01     | 11.18        | V             | 1.03           | 13.90             | 1.44          | 26.52                  | 40.00               | 13.48  |
| 148.51    | 11.25        | V             | 1.10           | 8.15              | 2.76          | 22.16                  | 40.00               | 17.84  |
| 216.00    | 8.70         | H             | 4.00           | 11.66             | 3.44          | 23.80                  | 40.00               | 16.20  |
| 374.99    | 13.02        | H             | 3.79           | 15.12             | 4.85          | 32.99                  | 47.00               | 14.01  |
| 456.00    | 8.42         | H             | 3.84           | 16.48             | 5.44          | 30.34                  | 47.00               | 16.66  |
| 456.00    | 14.59        | V             | 1.00           | 16.48             | 5.44          | 36.51                  | 47.00               | 10.49  |
| 503.99    | 9.53         | V             | 1.00           | 17.19             | 5.77          | 32.49                  | 47.00               | 14.51  |
| 504.01    | 7.90         | H             | 3.38           | 17.19             | 5.77          | 30.86                  | 47.00               | 16.14  |

\* H : Horizontal, V : Vertical



## Radiated Electric Field Emissions(Above 1 GHz)

- 12 V (dc) Mode



Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : 12 V (dc)  
Memo : (1 ~ 3) GHz

|      | Read<br>Freq | Ant<br>Level | Ant<br>Factor | Cable<br>Loss | Preamp<br>Factor | TPos | Limit<br>Line | Over<br>Limit | Pol/Phase  | Remark  |
|------|--------------|--------------|---------------|---------------|------------------|------|---------------|---------------|------------|---------|
|      | MHz          | dBuV         | dB/m          | dB            | dB               | deg  | dBuV/m        | dB            |            |         |
| 1    | 1336.00      | 38.76        | 25.24         | 7.48          | 39.96            | 336  | 56.00         | -24.48        | horizontal | Average |
| 2    | 1336.00      | 54.87        | 25.24         | 7.48          | 39.96            | 336  | 76.00         | -28.37        | horizontal | Peak    |
| 3    | 1396.00      | 31.93        | 25.48         | 7.66          | 39.93            | 111  | 56.00         | -30.86        | horizontal | Average |
| 4    | 1396.00      | 52.92        | 25.48         | 7.66          | 39.93            | 111  | 76.00         | -29.87        | horizontal | Peak    |
| 5    | 1596.00      | 33.70        | 26.28         | 8.24          | 39.83            | 88   | 56.00         | -27.61        | horizontal | Average |
| 6 pk | 1596.00      | 56.14        | 26.28         | 8.24          | 39.83            | 88   | 76.00         | -23.17        | horizontal | Peak    |
| 7 pp | 1782.00      | 43.66        | 27.01         | 8.75          | 39.74            | 33   | 56.00         | -16.32        | horizontal | Average |
| 8    | 1782.00      | 48.07        | 27.01         | 8.75          | 39.74            | 33   | 76.00         | -31.91        | horizontal | Peak    |
| 9    | 1930.00      | 39.38        | 27.60         | 9.16          | 39.66            | 5    | 56.00         | -19.52        | horizontal | Average |
| 10   | 1930.00      | 50.66        | 27.60         | 9.16          | 39.66            | 5    | 76.00         | -28.24        | horizontal | Peak    |
| 11   | 2228.00      | 40.46        | 28.44         | 9.70          | 39.76            | 356  | 56.00         | -17.16        | horizontal | Average |
| 12   | 2228.00      | 48.93        | 28.44         | 9.70          | 39.76            | 356  | 76.00         | -28.69        | horizontal | Peak    |

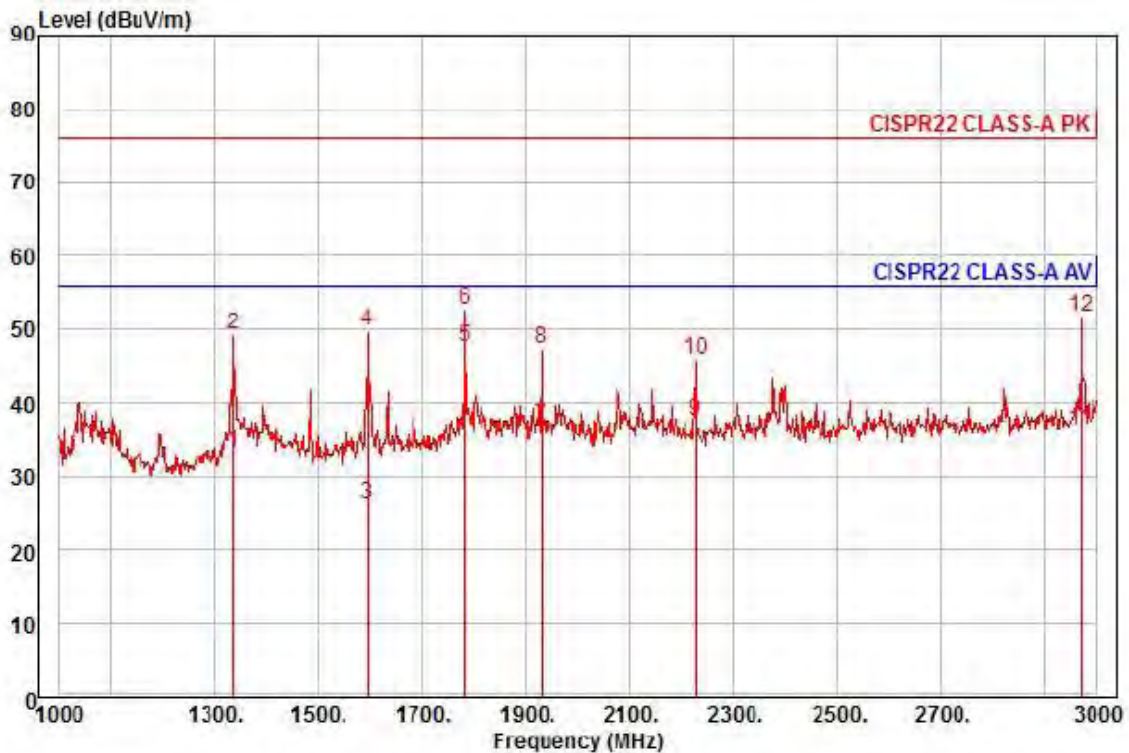
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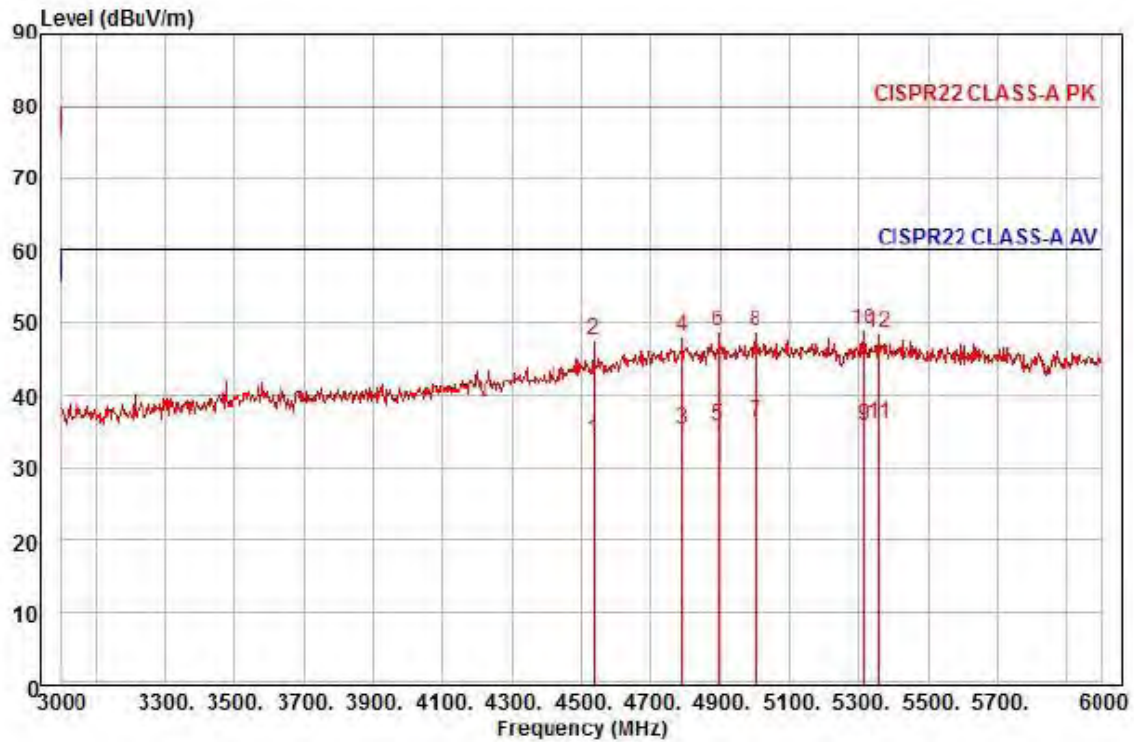
Test report No.:  
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Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : 12 V (dc)  
Memo : (1 - 3) GHz

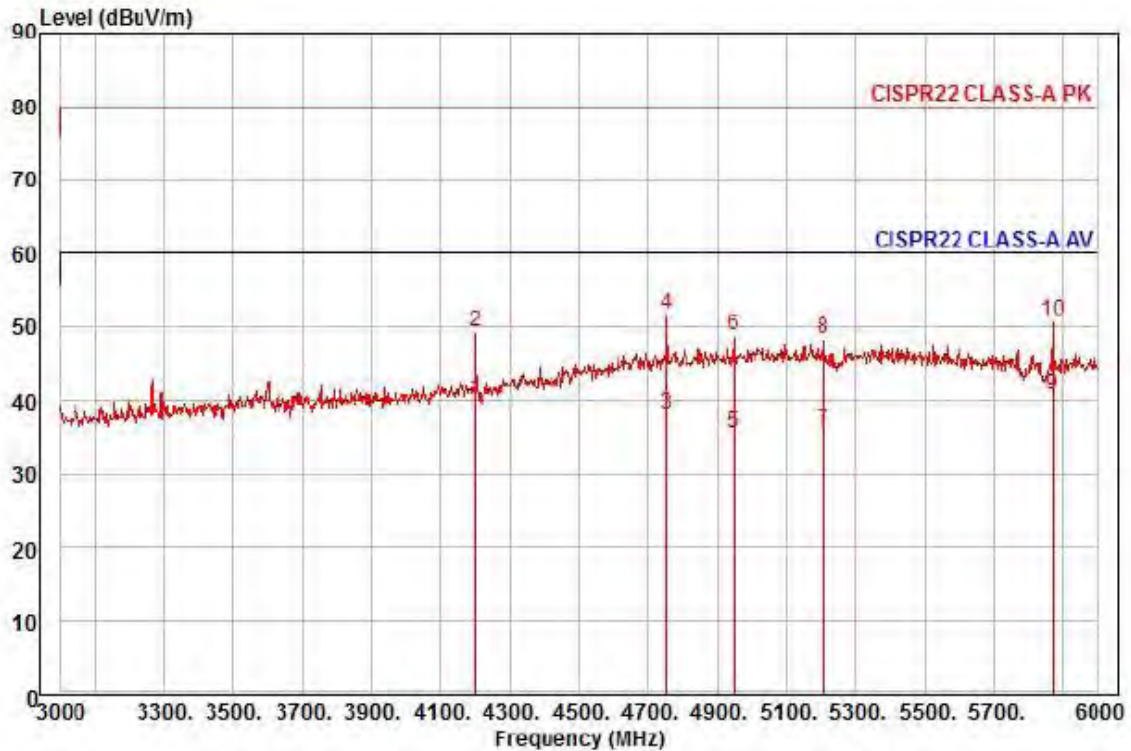
|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase | Remark  |
|------|---------|------------|------------|------------|---------------|------|------------|------------|-----------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB            | deg  | dBuV/m     | dB         |           |         |
| 1    | 1336.00 | 40.62      | 25.24      | 7.48       | 39.96         | 263  | 56.00      | -22.62     | vertical  | Average |
| 2    | 1336.00 | 56.64      | 25.24      | 7.48       | 39.96         | 263  | 76.00      | -26.60     | vertical  | Peak    |
| 3    | 1596.00 | 31.62      | 26.28      | 8.24       | 39.83         | 41   | 56.00      | -29.69     | vertical  | Average |
| 4    | 1596.00 | 55.17      | 26.28      | 8.24       | 39.83         | 41   | 76.00      | -26.14     | vertical  | Peak    |
| 5 pp | 1782.00 | 51.54      | 27.01      | 8.75       | 39.74         | 283  | 56.00      | -8.44      | vertical  | Average |
| 6 pk | 1782.00 | 56.71      | 27.01      | 8.75       | 39.74         | 283  | 76.00      | -23.27     | vertical  | Peak    |
| 7    | 1930.00 | 39.66      | 27.60      | 9.16       | 39.66         | 110  | 56.00      | -19.24     | vertical  | Average |
| 8    | 1930.00 | 50.28      | 27.60      | 9.16       | 39.66         | 110  | 76.00      | -28.62     | vertical  | Peak    |
| 9    | 2228.00 | 39.19      | 28.44      | 9.70       | 39.76         | 86   | 56.00      | -18.43     | vertical  | Average |
| 10   | 2228.00 | 47.49      | 28.44      | 9.70       | 39.76         | 86   | 76.00      | -30.13     | vertical  | Peak    |
| 11   | 2970.00 | 35.19      | 30.26      | 11.15      | 40.19         | 154  | 56.00      | -19.59     | vertical  | Average |
| 12   | 2970.00 | 50.61      | 30.26      | 11.15      | 40.19         | 154  | 76.00      | -24.17     | vertical  | Peak    |

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Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : 12 V (dc)  
Memo : (3 - 6) GHz

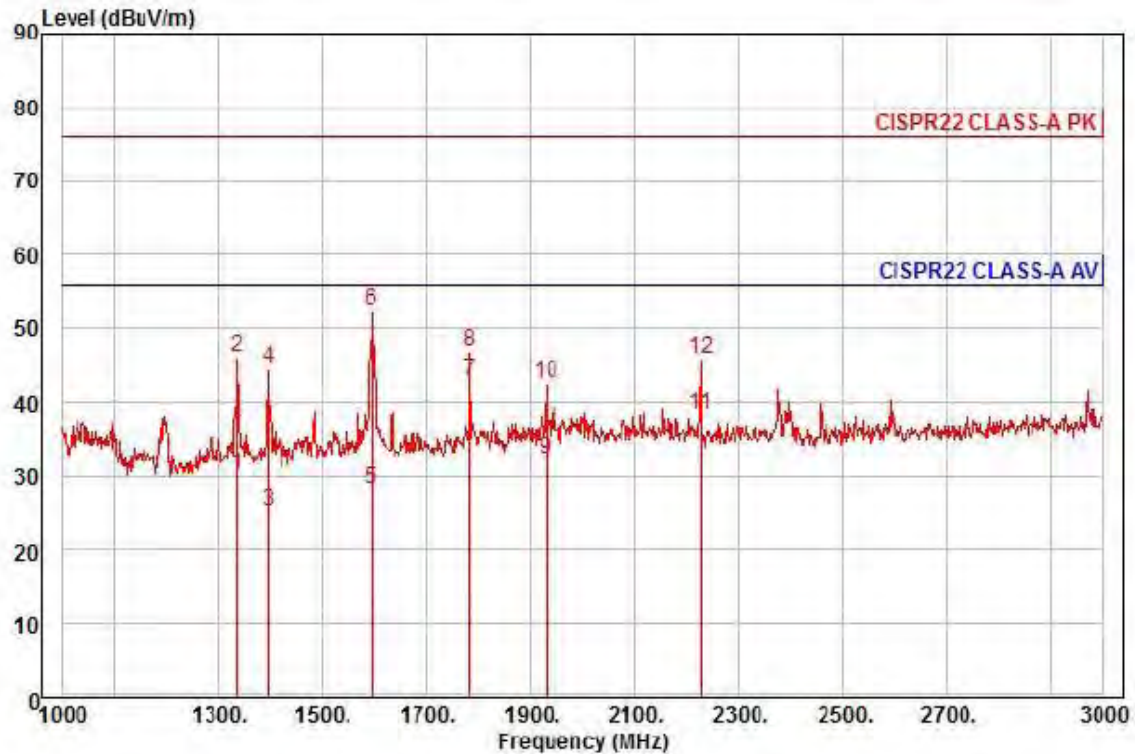
|       | Freq    | Read Level | Ant Factor | Cable Loss | Preamplifier Factor | TPos | Limit Line | Over Limit | Pol/Phase  | Remark  |
|-------|---------|------------|------------|------------|---------------------|------|------------|------------|------------|---------|
|       | MHz     | dBuV       | dB/m       | dB         | dB                  | deg  | dBuV/m     | dB         |            |         |
| 1     | 4536.00 | 24.71      | 35.07      | 14.49      | 40.41               | 33   | 60.00      | -26.14     | horizontal | Average |
| 2     | 4536.00 | 38.32      | 35.07      | 14.49      | 40.41               | 33   | 80.00      | -32.53     | horizontal | Peak    |
| 3     | 4788.00 | 24.26      | 36.51      | 14.95      | 40.41               | 128  | 60.00      | -24.69     | horizontal | Average |
| 4     | 4788.00 | 37.11      | 36.51      | 14.95      | 40.41               | 128  | 80.00      | -31.84     | horizontal | Peak    |
| 5     | 4896.00 | 24.01      | 37.13      | 15.14      | 40.41               | 157  | 60.00      | -24.13     | horizontal | Average |
| 6     | 4896.00 | 36.87      | 37.13      | 15.14      | 40.41               | 157  | 80.00      | -31.27     | horizontal | Peak    |
| 7 pp  | 5001.00 | 23.54      | 37.72      | 15.33      | 40.41               | 45   | 60.00      | -23.82     | horizontal | Average |
| 8     | 5001.00 | 36.20      | 37.72      | 15.33      | 40.41               | 45   | 80.00      | -31.16     | horizontal | Peak    |
| 9     | 5316.00 | 23.49      | 37.08      | 15.70      | 40.37               | 33   | 60.00      | -24.10     | horizontal | Average |
| 10 pk | 5316.00 | 36.65      | 37.08      | 15.70      | 40.37               | 33   | 80.00      | -30.94     | horizontal | Peak    |
| 11    | 5358.00 | 23.55      | 37.00      | 15.75      | 40.36               | 56   | 60.00      | -24.06     | horizontal | Average |
| 12    | 5358.00 | 36.19      | 37.00      | 15.75      | 40.36               | 56   | 80.00      | -31.42     | horizontal | Peak    |



Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : 12 V (dc)  
Memo : (3 - 6) GHz

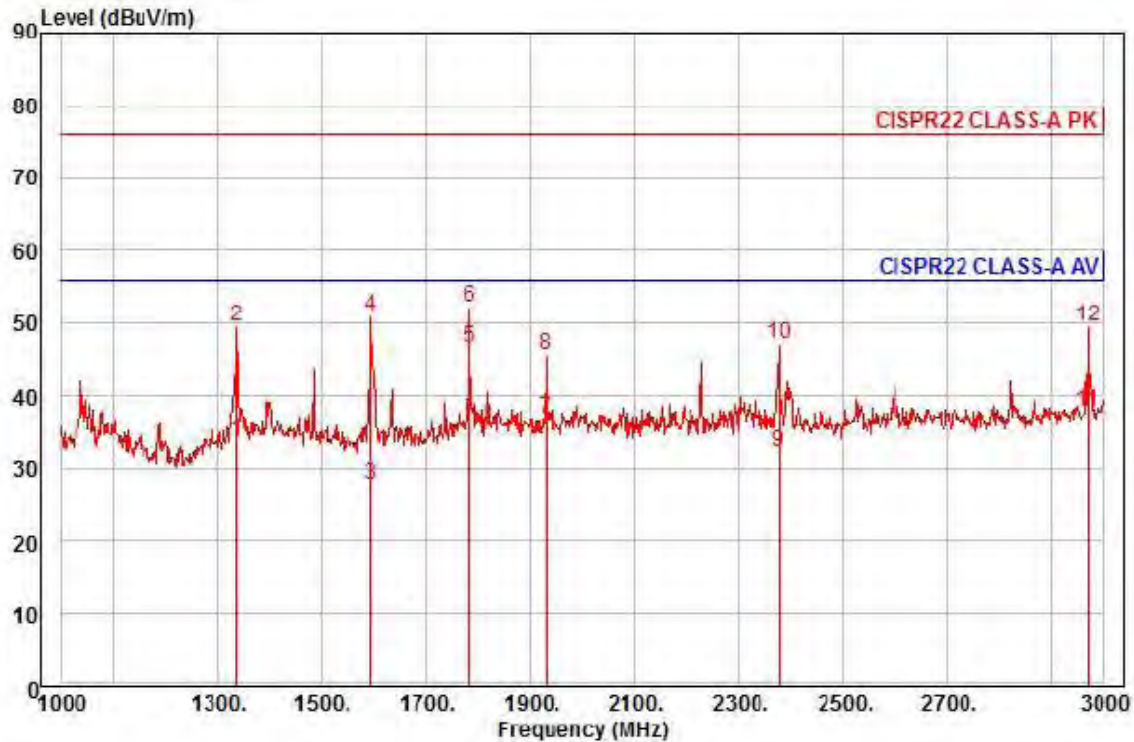
|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase | Remark  |
|------|---------|------------|------------|------------|---------------|------|------------|------------|-----------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB            | deg  | dBuV/m     | dB         |           |         |
| 1    | 4200.00 | 33.55      | 33.15      | 13.88      | 40.41         | 223  | 60.00      | -19.83     | vertical  | Average |
| 2    | 4200.00 | 42.76      | 33.15      | 13.88      | 40.41         | 223  | 80.00      | -30.62     | vertical  | Peak    |
| 3    | 4752.00 | 27.30      | 36.30      | 14.88      | 40.41         | 205  | 60.00      | -21.93     | vertical  | Average |
| 4 pk | 4752.00 | 41.06      | 36.30      | 14.88      | 40.41         | 205  | 80.00      | -28.17     | vertical  | Peak    |
| 5    | 4947.00 | 23.44      | 37.42      | 15.23      | 40.41         | 1    | 60.00      | -24.32     | vertical  | Average |
| 6    | 4947.00 | 36.47      | 37.42      | 15.23      | 40.41         | 1    | 80.00      | -31.29     | vertical  | Peak    |
| 7    | 5208.00 | 23.36      | 37.30      | 15.58      | 40.38         | 122  | 60.00      | -24.14     | vertical  | Average |
| 8    | 5208.00 | 35.87      | 37.30      | 15.58      | 40.38         | 122  | 80.00      | -31.63     | vertical  | Peak    |
| 9 pp | 5871.00 | 28.53      | 35.96      | 16.62      | 40.29         | 65   | 60.00      | -19.18     | vertical  | Average |
| 10   | 5871.00 | 38.37      | 35.96      | 16.62      | 40.29         | 65   | 80.00      | -29.34     | vertical  | Peak    |

- PoE Mode



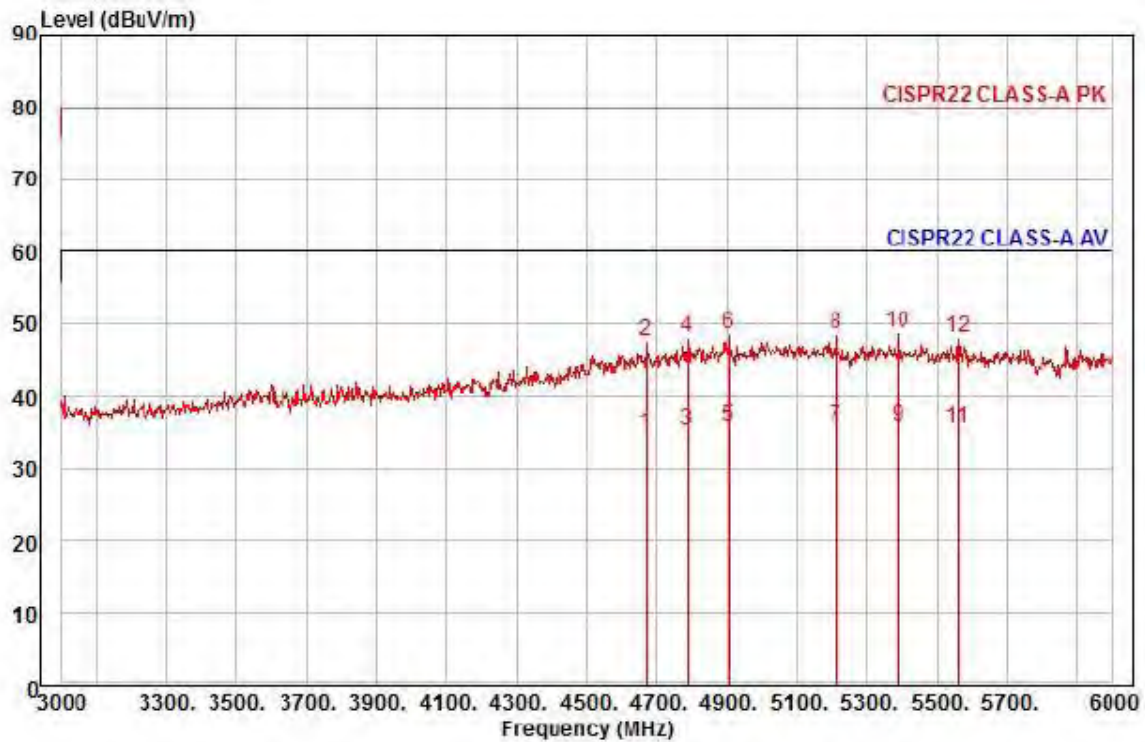
Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : PoE  
Memo : (1 - 3) GHz

|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase  | Remark  |
|------|---------|------------|------------|------------|---------------|------|------------|------------|------------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB            | deg  | dBuV/m     | dB         |            |         |
| 1    | 1336.00 | 37.49      | 25.24      | 7.48       | 39.96         | 274  | 56.00      | -25.75     | horizontal | Average |
| 2    | 1336.00 | 53.26      | 25.24      | 7.48       | 39.96         | 274  | 76.00      | -29.98     | horizontal | Peak    |
| 3    | 1396.00 | 31.93      | 25.48      | 7.66       | 39.93         | 118  | 56.00      | -30.86     | horizontal | Average |
| 4    | 1396.00 | 51.40      | 25.48      | 7.66       | 39.93         | 118  | 76.00      | -31.39     | horizontal | Peak    |
| 5    | 1596.00 | 33.61      | 26.28      | 8.24       | 39.83         | 271  | 56.00      | -27.70     | horizontal | Average |
| 6 pk | 1596.00 | 57.66      | 26.28      | 8.24       | 39.83         | 271  | 76.00      | -23.45     | horizontal | Peak    |
| 7 pp | 1782.00 | 46.83      | 27.01      | 8.75       | 39.74         | 199  | 56.00      | -13.15     | horizontal | Average |
| 8    | 1782.00 | 50.82      | 27.01      | 8.75       | 39.74         | 199  | 76.00      | -29.16     | horizontal | Peak    |
| 9    | 1930.00 | 35.23      | 27.60      | 9.16       | 39.66         | 210  | 56.00      | -23.67     | horizontal | Average |
| 10   | 1930.00 | 45.51      | 27.60      | 9.16       | 39.66         | 210  | 76.00      | -33.39     | horizontal | Peak    |
| 11   | 2228.00 | 39.77      | 28.44      | 9.70       | 39.76         | 342  | 56.00      | -17.85     | horizontal | Average |
| 12   | 2228.00 | 47.39      | 28.44      | 9.70       | 39.76         | 342  | 76.00      | -30.23     | horizontal | Peak    |



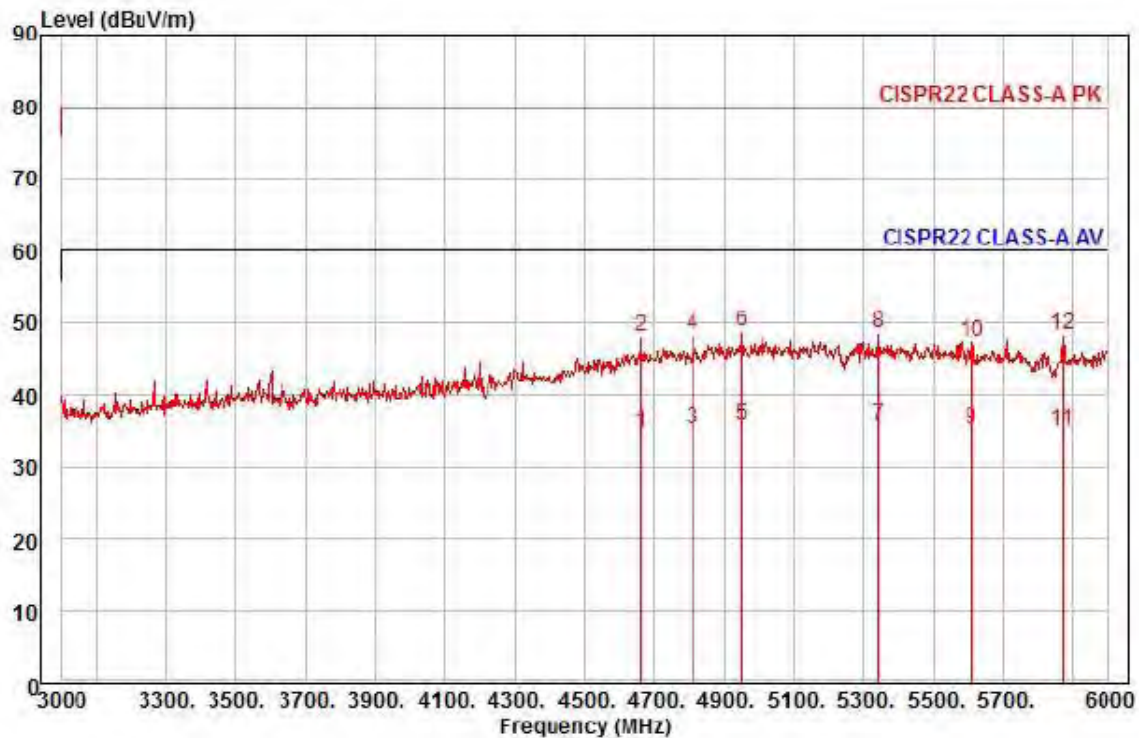
Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project : NETWORK CAMERA  
Model : QND-7080RP  
Mode : PoE  
Memo : (1 - 3) GHz

|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamplifier Factor | TPos | Limit Line | Over Limit | Pol/Phase | Remark  |
|------|---------|------------|------------|------------|---------------------|------|------------|------------|-----------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB                  | deg  | dBuV/m     | dB         |           |         |
| 1    | 1336.00 | 41.10      | 25.24      | 7.48       | 39.96               | 189  | 56.00      | -22.14     | vertical  | Average |
| 2    | 1336.00 | 56.83      | 25.24      | 7.48       | 39.96               | 189  | 76.00      | -26.41     | vertical  | Peak    |
| 3    | 1594.00 | 33.08      | 26.27      | 8.23       | 39.83               | 14   | 56.00      | -28.25     | vertical  | Average |
| 4    | 1594.00 | 56.22      | 26.27      | 8.23       | 39.83               | 14   | 76.00      | -25.11     | vertical  | Peak    |
| 5 pp | 1782.00 | 50.50      | 27.01      | 8.75       | 39.74               | 270  | 56.00      | -9.48      | vertical  | Average |
| 6 pk | 1782.00 | 56.17      | 27.01      | 8.75       | 39.74               | 270  | 76.00      | -23.81     | vertical  | Peak    |
| 7    | 1930.00 | 39.56      | 27.60      | 9.16       | 39.66               | 25   | 56.00      | -19.34     | vertical  | Average |
| 8    | 1930.00 | 48.47      | 27.60      | 9.16       | 39.66               | 25   | 76.00      | -30.43     | vertical  | Peak    |
| 9    | 2378.00 | 33.53      | 28.81      | 9.93       | 39.85               | 276  | 56.00      | -23.58     | vertical  | Average |
| 10   | 2378.00 | 48.16      | 28.81      | 9.93       | 39.85               | 276  | 76.00      | -28.95     | vertical  | Peak    |
| 11   | 2970.00 | 36.43      | 30.26      | 11.15      | 40.19               | 201  | 56.00      | -18.35     | vertical  | Average |
| 12   | 2970.00 | 48.40      | 30.26      | 11.15      | 40.19               | 201  | 76.00      | -26.38     | vertical  | Peak    |



Site : chamber  
 Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
 : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
 Project : NETWORK CAMERA  
 Model : QND-7080RP  
 Mode : PoE  
 Memo : (3 - 6) GHz

|       | Freq    | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase  | Remark  |
|-------|---------|------------|------------|------------|---------------|------|------------|------------|------------|---------|
|       | MHz     | dBuV       | dB/m       | dB         | dB            | deg  | dBuV/m     | dB         |            |         |
| 1     | 4671.00 | 24.68      | 35.84      | 14.74      | 40.41         | 213  | 60.00      | -25.15     | horizontal | Average |
| 2     | 4671.00 | 37.47      | 35.84      | 14.74      | 40.41         | 213  | 80.00      | -32.36     | horizontal | Peak    |
| 3     | 4785.00 | 24.20      | 36.49      | 14.94      | 40.41         | 141  | 60.00      | -24.78     | horizontal | Average |
| 4     | 4785.00 | 37.00      | 36.49      | 14.94      | 40.41         | 141  | 80.00      | -31.98     | horizontal | Peak    |
| 5     | 4905.00 | 23.77      | 37.18      | 15.16      | 40.41         | 46   | 60.00      | -24.30     | horizontal | Average |
| 6     | 4905.00 | 36.73      | 37.18      | 15.16      | 40.41         | 46   | 80.00      | -31.34     | horizontal | Peak    |
| 7 pp  | 5214.00 | 23.37      | 37.29      | 15.58      | 40.38         | 279  | 60.00      | -24.14     | horizontal | Average |
| 8     | 5214.00 | 36.14      | 37.29      | 15.58      | 40.38         | 279  | 80.00      | -31.37     | horizontal | Peak    |
| 9     | 5388.00 | 23.47      | 36.94      | 15.79      | 40.36         | 152  | 60.00      | -24.16     | horizontal | Average |
| 10 pk | 5388.00 | 36.35      | 36.94      | 15.79      | 40.36         | 152  | 80.00      | -31.28     | horizontal | Peak    |
| 11    | 5559.00 | 23.23      | 36.59      | 16.03      | 40.33         | 342  | 60.00      | -24.48     | horizontal | Average |
| 12    | 5559.00 | 35.83      | 36.59      | 16.03      | 40.33         | 342  | 80.00      | -31.88     | horizontal | Peak    |



Site : chamber

Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical

: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto

Project : NETWORK CAMERA

Model : QND-7080RP

Mode : PoE

Memo : (3 - 6) GHz

|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamplifier | TPos | Limit Line | Over Limit | Pol/Phase | Remark  |
|------|---------|------------|------------|------------|--------------|------|------------|------------|-----------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB           | deg  | dBuV/m     | dB         |           |         |
| 1    | 4662.00 | 24.69      | 35.79      | 14.72      | 40.41        | 309  | 60.00      | -25.21     | vertical  | Average |
| 2    | 4662.00 | 37.93      | 35.79      | 14.72      | 40.41        | 309  | 80.00      | -31.97     | vertical  | Peak    |
| 3    | 4812.00 | 24.02      | 36.65      | 14.99      | 40.41        | 209  | 60.00      | -24.75     | vertical  | Average |
| 4    | 4812.00 | 37.04      | 36.65      | 14.99      | 40.41        | 209  | 80.00      | -31.73     | vertical  | Peak    |
| 5    | 4950.00 | 23.44      | 37.43      | 15.24      | 40.41        | 75   | 60.00      | -24.30     | vertical  | Average |
| 6 pk | 4950.00 | 36.44      | 37.43      | 15.24      | 40.41        | 75   | 80.00      | -31.30     | vertical  | Peak    |
| 7 pp | 5340.00 | 23.52      | 37.03      | 15.73      | 40.36        | 212  | 60.00      | -24.08     | vertical  | Average |
| 8    | 5340.00 | 36.27      | 37.03      | 15.73      | 40.36        | 212  | 80.00      | -31.33     | vertical  | Peak    |
| 9    | 5610.00 | 22.97      | 36.49      | 16.13      | 40.32        | 130  | 60.00      | -24.73     | vertical  | Average |
| 10   | 5610.00 | 35.05      | 36.49      | 16.13      | 40.32        | 130  | 80.00      | -32.65     | vertical  | Peak    |
| 11   | 5871.00 | 22.90      | 35.96      | 16.62      | 40.29        | 87   | 60.00      | -24.81     | vertical  | Average |
| 12   | 5871.00 | 36.07      | 35.96      | 16.62      | 40.29        | 87   | 80.00      | -31.64     | vertical  | Peak    |

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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

### Average harmonic current results

| Hn | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
|----|----------------------|------------|-----------|--------|
| 1  | N/A                  |            |           |        |
| 2  |                      |            |           |        |
| 3  |                      |            |           |        |
| 4  |                      |            |           |        |
| 5  |                      |            |           |        |
| 6  |                      |            |           |        |
| 7  |                      |            |           |        |
| 8  |                      |            |           |        |
| 9  |                      |            |           |        |
| 10 |                      |            |           |        |
| 11 |                      |            |           |        |
| 12 |                      |            |           |        |
| 13 |                      |            |           |        |
| 14 |                      |            |           |        |
| 15 |                      |            |           |        |
| 16 |                      |            |           |        |
| 17 |                      |            |           |        |
| 18 |                      |            |           |        |
| 19 |                      |            |           |        |
| 20 |                      |            |           |        |
| 21 |                      |            |           |        |
| 22 |                      |            |           |        |
| 23 |                      |            |           |        |
| 24 |                      |            |           |        |
| 25 |                      |            |           |        |
| 26 |                      |            |           |        |
| 27 |                      |            |           |        |
| 28 |                      |            |           |        |
| 29 |                      |            |           |        |
| 30 |                      |            |           |        |
| 31 |                      |            |           |        |
| 32 |                      |            |           |        |
| 33 |                      |            |           |        |
| 34 |                      |            |           |        |
| 35 |                      |            |           |        |
| 36 |                      |            |           |        |
| 37 |                      |            |           |        |
| 38 |                      |            |           |        |
| 39 |                      |            |           |        |
| 40 |                      |            |           |        |

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

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## Test Data - Harmonics (continued)

**Maximum harmonic current results**

| Hn | I <sub>eff</sub> [A] | % of Limit | Limit [A] | Result |
|----|----------------------|------------|-----------|--------|
| 1  | N/A                  |            |           |        |
| 2  |                      |            |           |        |
| 3  |                      |            |           |        |
| 4  |                      |            |           |        |
| 5  |                      |            |           |        |
| 6  |                      |            |           |        |
| 7  |                      |            |           |        |
| 8  |                      |            |           |        |
| 9  |                      |            |           |        |
| 10 |                      |            |           |        |
| 11 |                      |            |           |        |
| 12 |                      |            |           |        |
| 13 |                      |            |           |        |
| 14 |                      |            |           |        |
| 15 |                      |            |           |        |
| 16 |                      |            |           |        |
| 17 |                      |            |           |        |
| 18 |                      |            |           |        |
| 19 |                      |            |           |        |
| 20 |                      |            |           |        |
| 21 |                      |            |           |        |
| 22 |                      |            |           |        |
| 23 |                      |            |           |        |
| 24 |                      |            |           |        |
| 25 |                      |            |           |        |
| 26 |                      |            |           |        |
| 27 |                      |            |           |        |
| 28 |                      |            |           |        |
| 29 |                      |            |           |        |
| 30 |                      |            |           |        |
| 31 |                      |            |           |        |
| 32 |                      |            |           |        |
| 33 |                      |            |           |        |
| 34 |                      |            |           |        |
| 35 |                      |            |           |        |
| 36 |                      |            |           |        |
| 37 |                      |            |           |        |
| 38 |                      |            |           |        |
| 39 |                      |            |           |        |
| 40 |                      |            |           |        |

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

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Test Data - Voltage Fluctuations

**Maximum Flicker results**

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | N/A        |       |        |
| Plt      |            |       |        |
| dc [%]   |            |       |        |
| dmax [%] |            |       |        |
| Tmax [s] |            |       |        |



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## **Test Setup Photos and Configuration**

### **Conducted Voltage Emissions**

N/A

N/A

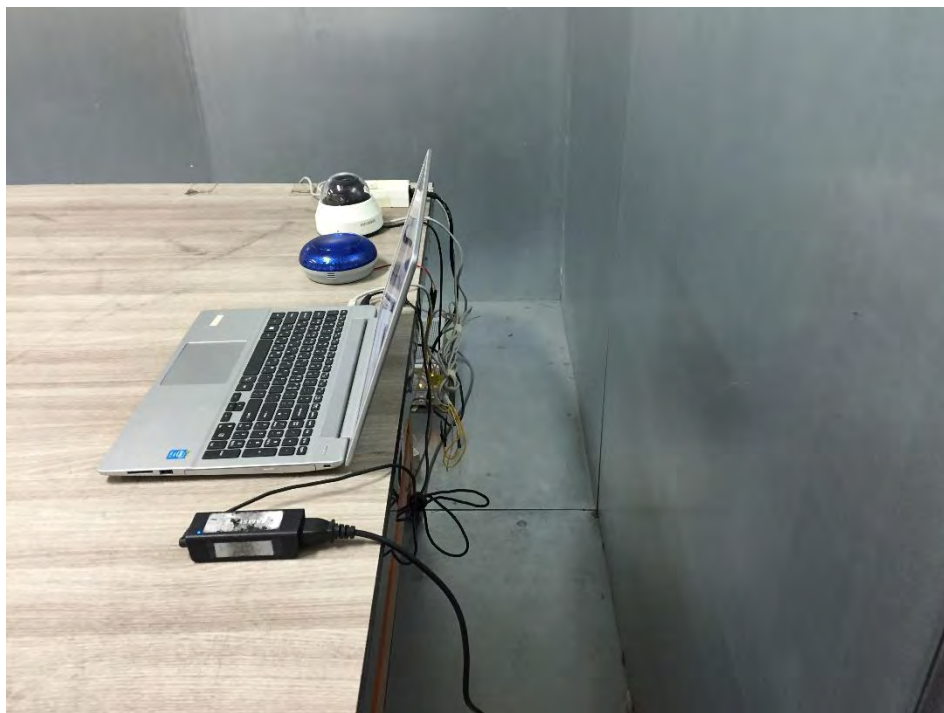
## Conducted Telecommunication Emissions

- 12 V (dc) Mode



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- PoE Mode



## Radiated Electric Field Emissions(Below 1 GHz)

- 12 V (dc) Mode



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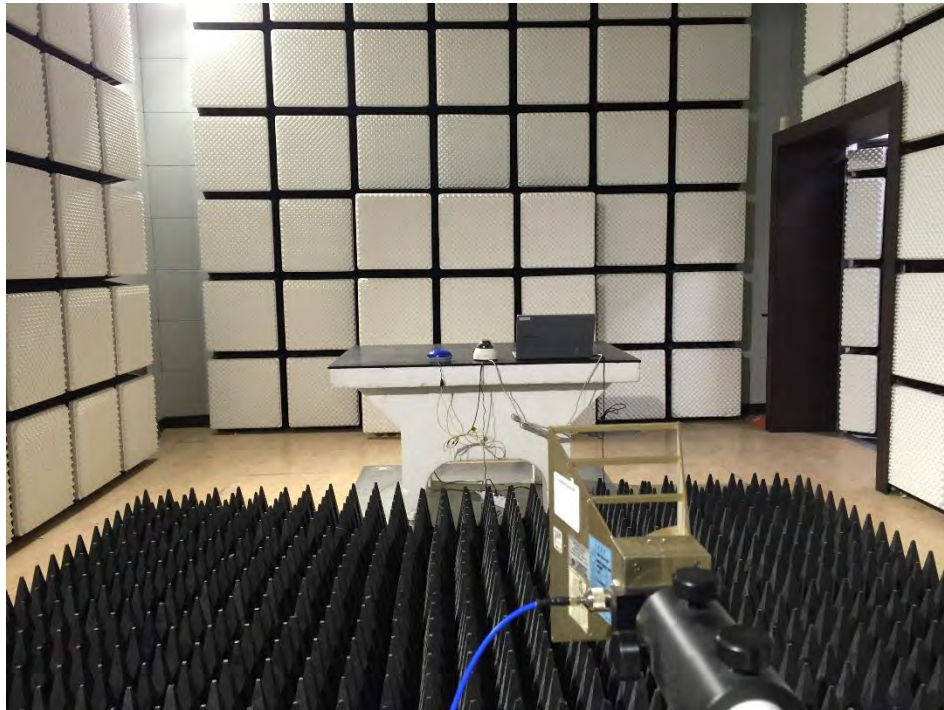
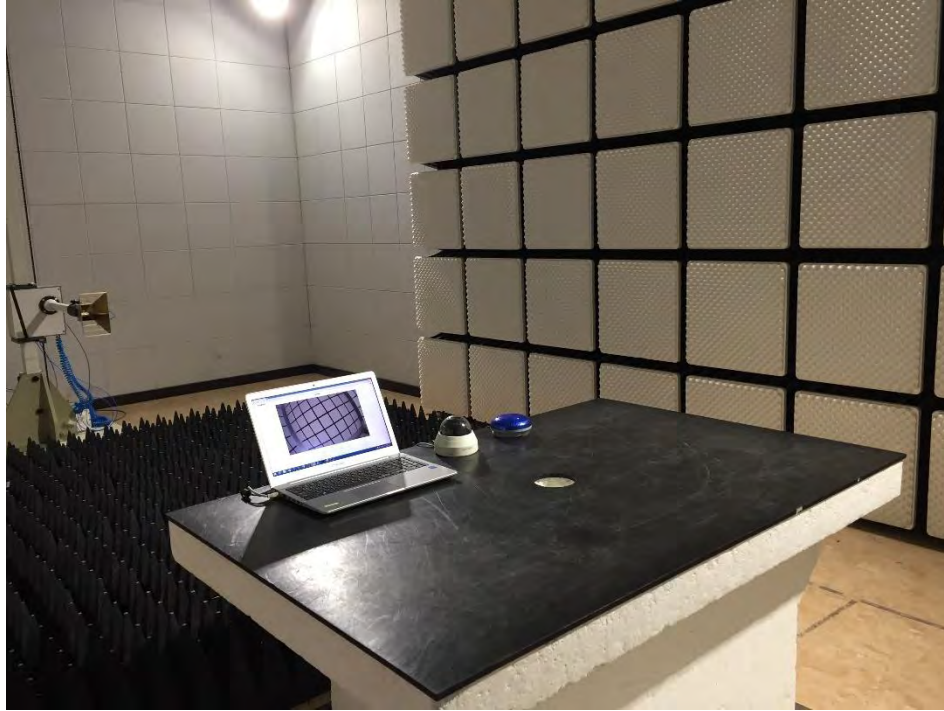
- PoE Mode



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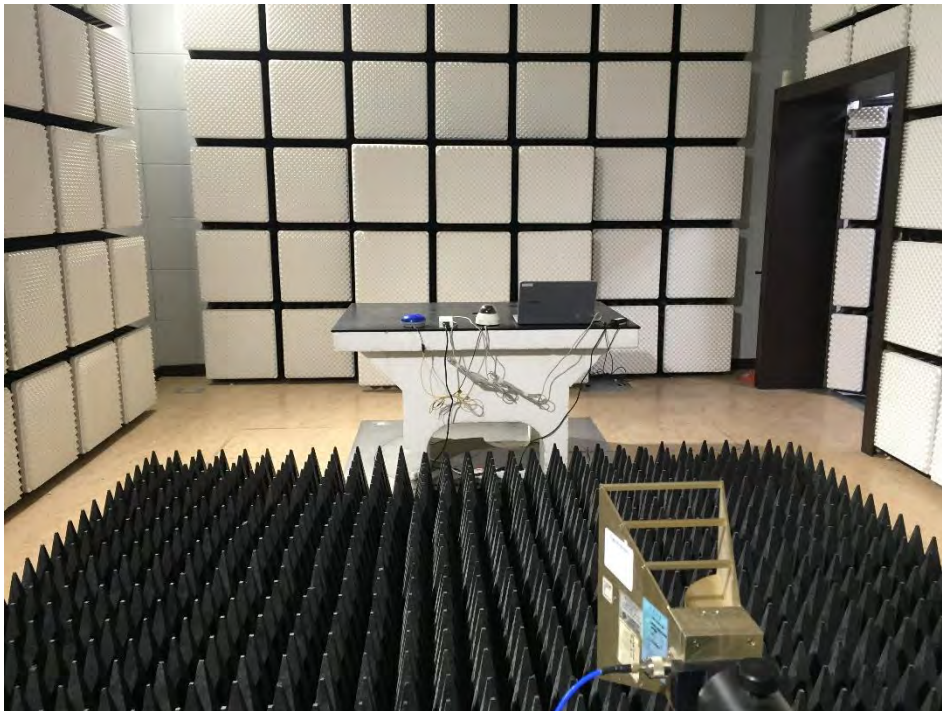
## Radiated Electric Field Emissions(Above 1 GHz)

- 12 V (dc) Mode



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- PoE Mode



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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

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## Electrostatic Discharge

- 12 V (dc) Mode



- PoE Mode



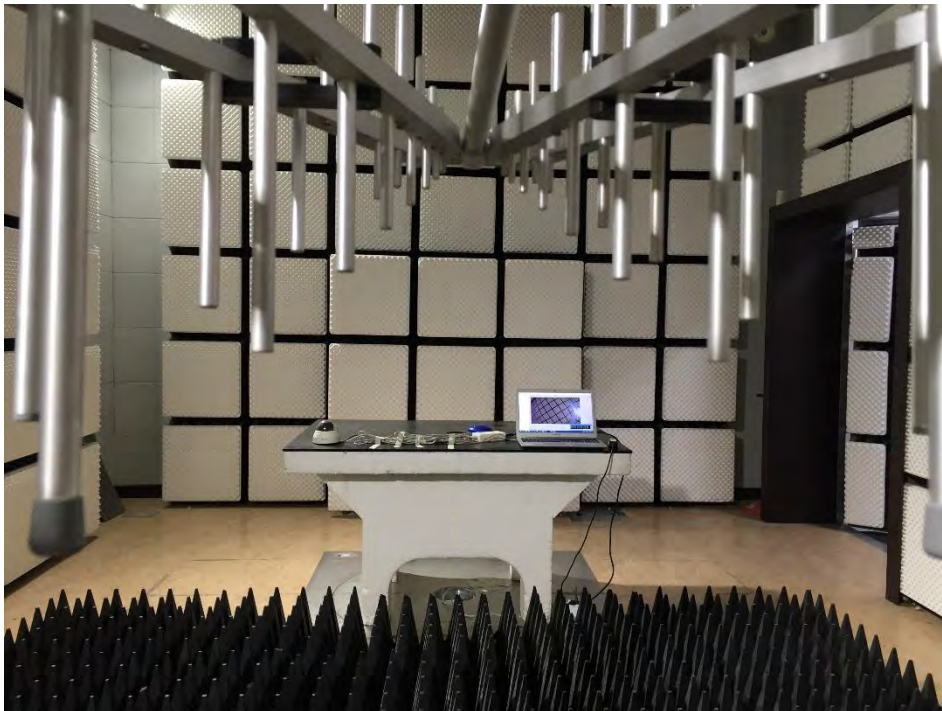
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## Radiated Electric Field Immunity

- 12 V (dc) Mode



- PoE Mode



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## Electrical Fast Transients/Bursts

- 12 V (dc) Mode



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- PoE Mode



## Surge Transients

- 12 V (dc) Mode



- PoE Mode



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## Conducted Disturbance

- 12 V (dc) Mode



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- PoE Mode





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## **Voltage Dips and Short Interruptions**

N/A

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## EUT External Photographs

(Top)



(Bottom)



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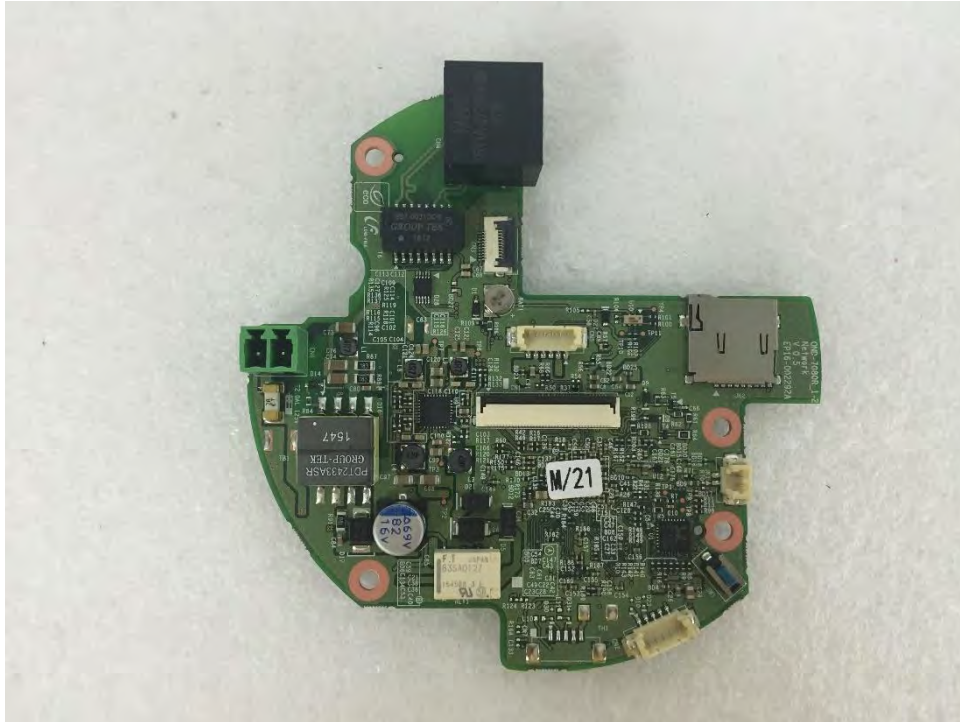
## **EUT Internal Photographs**

(Internal View)



## EUT Internal View – Main Board

(Top)



(Bottom)



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## EUT Internal View – IR LED Board

(Top)



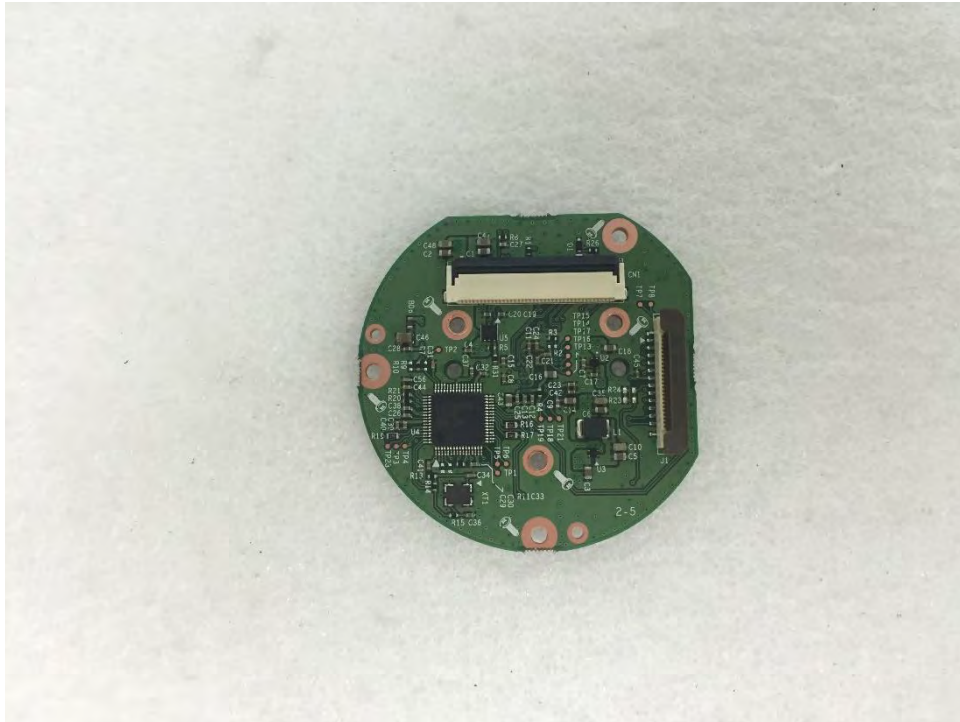
(Bottom)



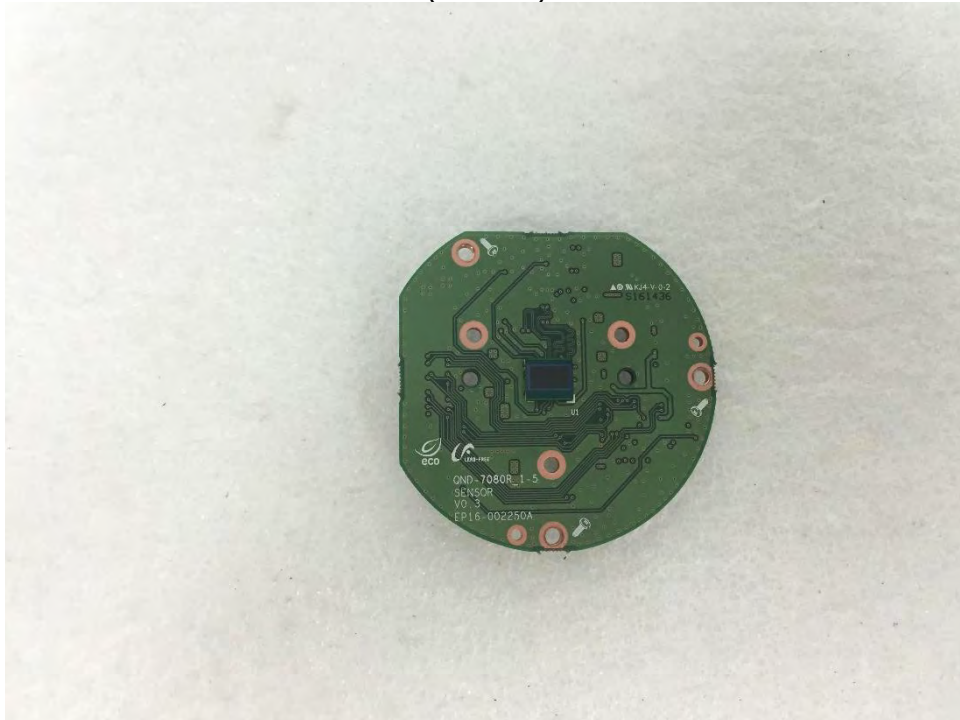
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## EUT Internal View – SENSOR Board

(Top)



(Bottom)



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## **EUT Internal View – Lens**

(Top)

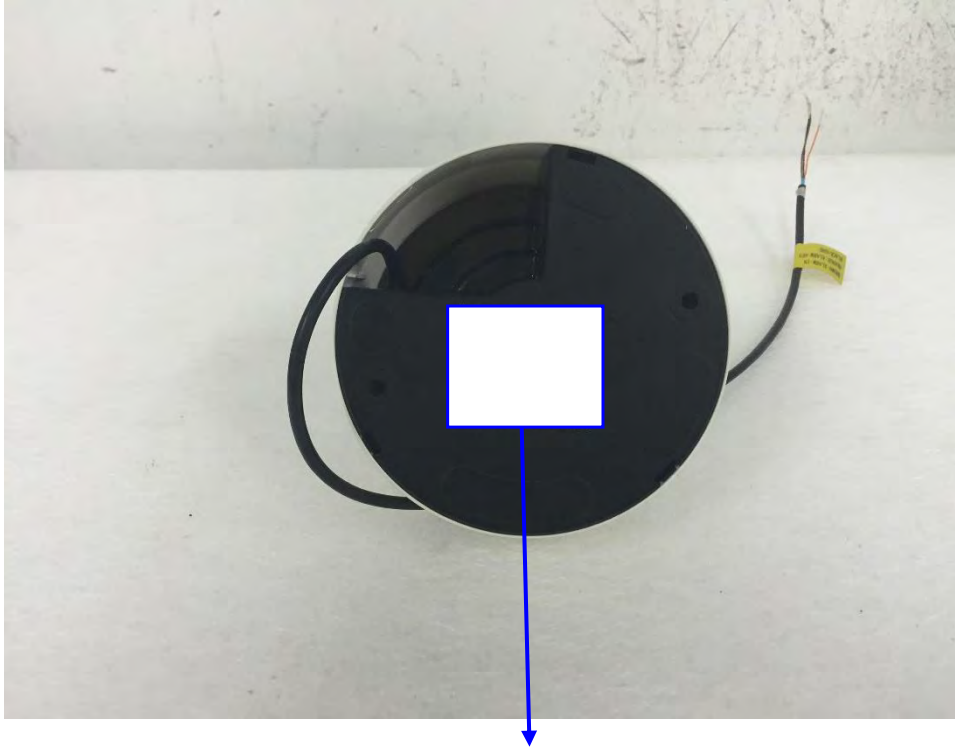


(Bottom)



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## Label and Location



### **NETWORK CAMERA**

Model No : QND-7080R

Manufacturer : Hanwha Techwin (Tianjin) Co., Ltd.

Made in China