# EU Declaration of Conformity

SAMSUNG

CE

***We hereby declare that the product***

| | | |
|---|---|---|
| *Type of equipment* | : | *NETWORK CAMERA* |
| *Brand Name / Trade Mark* | : | *SAMSUNG* |
| *Model number* | : | *QNO-7080RP* |
| *Variant Model* | : | *-* |

***satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/30/EU***

| | | |
|---|---|---|
| *EN 55022:2010* | : | *Limits and methods of measurement of radio disturbance characteristics of information technology equipment* |
| *EN 50581:2012* | | *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances* |
| *EN 50130-4:2011+A1:2014* | | *Product family standard: Immunity requirements for components of fire,intruder and social alarm systems* |
| *EN 61000-4-2:2009* | : | *Electrostatic discharge immunity test* |
| *EN 61000-4-3:2006+A2:2010* | : | *Radiated, radio-frequency, electromagnetic field immunity test* |
| *EN 61000-4-4:2012* | : | *Electrical fast transient/burst immunity test* |
| *EN 61000-4-5:2014* | : | *Surge immunity test* |
| *EN 61000-4-6:2009* | : | *Immunity to conducted disturbances, induced by radio-frequency fields* |

***All essential testing suites have been carrier out.***

| | | |
|---|---|---|
| *Manufacturer* | : | *Tianjin Samsung Techwin Opto-Electronic Co., Ltd.* |
| *Manufacturer address* | : | *No.11 Weiliu Rd,Micro-Electronic Industrial Park, TEDA, Tianjin, 300385, People's Republic of China* |
| *Telephone / Fax* | : | *82-02-729-2900 /82-02-729-2904 (www.hanwhatechwin.com)* |
| *Applicant* | : | *Hanwha Techwin Co., Ltd.* |
| *Applicant address* | : | *1204, Changwon-daero, Seongsan-gu, Chang-won-si, Gyeongsangnam-do, korea* |

***This declaration is issued under the sole responsibility of the manufacturer and his authorised representative.***

*Authorized signatory*

| | | |
|---|---|---|
| *Name / Title* | : | *Jei Soon, Kang / Principal Research Engineer* |
| *Date of issue* | : | *Jul. 05, 2016* |

# EMC TEST REPORT For CE

| | | |
|---|---|---|
| Test Report No. | : | KES-E1-16T0306 |
| Date of Issue | : | Jul. 05. 2016 |
| Product name | : | NETWORK CAMERA |
| Model/Type No. | : | QNO-7080RP |
| Variant Model | : | - |
| Applicant | : | Hanwha Techwin Co., Ltd. |
| Applicant Address | : | 1204, Changwon-daero, Seongsan-gu Changwon-si, Gyeongsangnam-do, Korea |
| Manufacturer | : | Tianjin Samsung Techwin Opto-Electronic Co.,Ltd. |
| Manufacturer Address | : | No.11 Weiliu Rd,Micro-Electronic industrial Park, TEDA, Tianjin,300385,People's Republic of China |
| Date of Receipt | : | Jun. 16. 2016 |
| Test date | : | Jun. 29. 2016 ~ Jul. 03. 2016 |
| Test Results | : | ☒ **In Compliance** ☐ **Not in Compliance** |

*Tested by*

Dong Il, Lee
EMC Test Engineer

*Reviewed by*

Dong-Hun, Jang
EMC Technical Manager

# REPORT REVISION HISTORY

| Date | Test Report No. | Revision History |
|---|---|---|
| Jul. 05, 2016 | KES-E1-16T0306 | Issued |
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# 1.0 General Product Description

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

| | QNO-7080R |
|---|---|
| **Video** | |
| Imaging Device | 1/3" 4M CMOS |
| Total Pixels | 2720x1536 |
| Effective Pixels | 2688x1520 |
| Scanning System | Progressive |
| Min. Illumination | Color : 0.15Lux, B/W : 0Lux |
| **Lens** | |
| 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 |
| **Pan / Tilt / Rotate** | |
| Pan Range | 0 |
| Tilt Range | 0 |
| Rotate Range | 0 |
| **Operational** | |
| IR Viewable Length | 30m |
| 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), Transparency, Auto Scale by Resolution |
| Day & Night | True Day & Night |
| Backlight Compensation | Off / BLC |
| Highlight Compensation | (미지원) |
| Wide Dynamic Range | 120dB |
| Digital Noise Reduction | SSNR(Off / On) |
| Motion Detection | Off / On (4ea polygoon zones) |
| Privacy Masking | Off / On (6ea rectangler 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, 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 |

| Network | |
|---|---|
| Ethernet | RJ-45 (10/100BASE-T) |
| Video Compression Format | H.265, H.264, MJPEG |
| Resolution | 2592x1520, 2560x1440(16:9) / 2304x1296 / 1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 720x576 / 720x480 / 640x480 / 640x360 / 320x240 |
| Max. Framerate | H.265 : Max 20fps at 4M, Max 30fps at 3M all resolutions<br>H.264 : Max 20fps at 4M, Max 30fps at 3M all resolutions<br>MJPEG : Max 5fps |
| 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 | Line in |
| 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 Inte | 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 |
| Pixel Counter | Support ( plug-in viewer only ) |

| | |
|---|---|
| **Environmental** | |
| Operating Temperature / Hum | -30°C ~ +55°C / Less than 90% RH * Start up should be done at above -20°C |
| Storage Temperature / Humidi | -30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH |
| Ingress Protection | IP66 |
| Vandal Resistance | IK10 |
| **Electrical** | |
| Input Voltage / Current | PoE(IEEE802.3af, Class3), DC 12V |
| Power Consumption | Max.8W(PoE), Max.7W(DC12V) |
| **Mechanical** | |
| Color / Material | Gray / Metal |
| Dimension (WxHxD) | ϕ70.0x246mm |
| Weight | 750g |

## 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

N/A

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description | Model Number | Serial Number | Manufacturer | ReMarks |
|---|---|---|---|---|
| NETWORK CAMERA | QNO-7080RP | - | Hanwha Techwin Co., Ltd. | E.U.T |

## 1.5 Support Equipments

| Description | Model Number | Serial Number | Manufacturer | ReMarks |
|---|---|---|---|---|
| Notebook | NT63025J | JK9091EF400432X | SAMSUNG ELECTRONICS CO., LTD. | - |
| Notebook Adapter | A13-040N2A | CN60BA4400313AD0N843KO243 | Chicony Power Technology (suzhou)Co., Ltd. | - |
| Alarm Jig | SIE-0001 D0 | - | - | - |
| PoE Adapter | POE36U-1AT-R | - | PHIHONG | - |
| MIC | CMK-303 | - | CAMAC | - |

## 1.6 External I/O Cabling

- DC 12 V Mode

| Start | | END | | Cable Spec. | |
|---|---|---|---|---|---|
| **Description** | **I/O Port** | **Description** | **I/O Port** | **Length** | **Shield** |
| NETWORK CAMERA (E.U.T) | RJ-45 | Notebook | RJ-45 | 3.0 | U |
| | Audio IN | MIC | Audio IN | 1.9 | U |
| | Alarm | Alarm Jig | 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) | RJ-45 | PoE Adapter | RJ-45 | 3.0 | U |
| | Audio IN | MIC | Audio IN | 1.9 | U |
| | Alarm | Alarm Jig | Alarm | 3.0 | U |
| PoE Adapter | RJ-45 | Notebook | RJ-45 | 1.2 | 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:

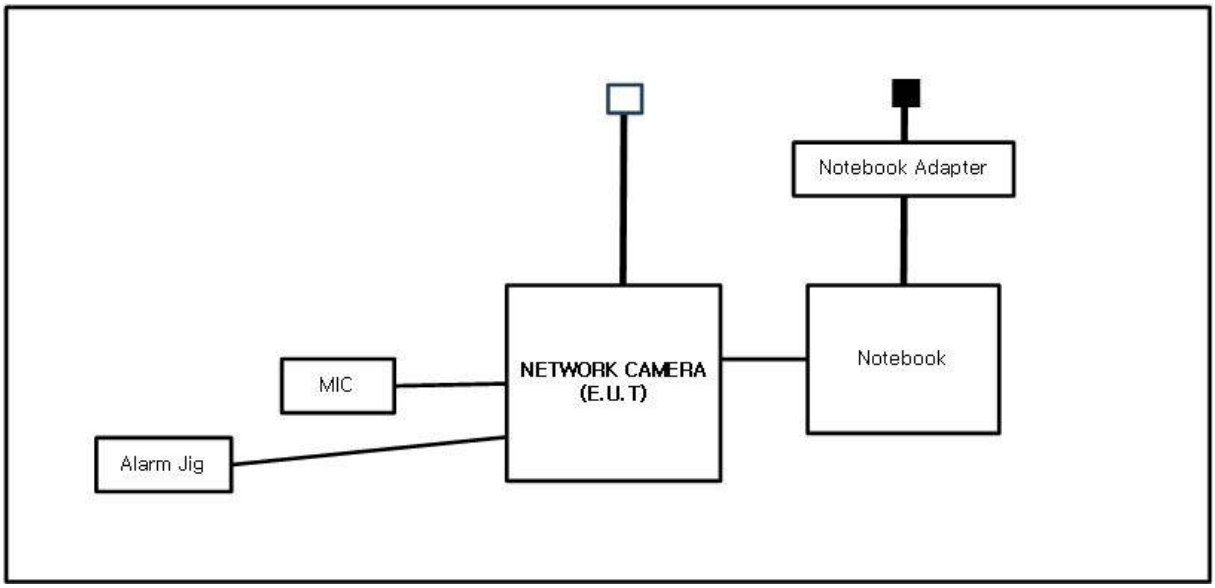
| Test mode | Normal operating |
|---|---|
| OP | MONITORING<br>PING TEST |

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

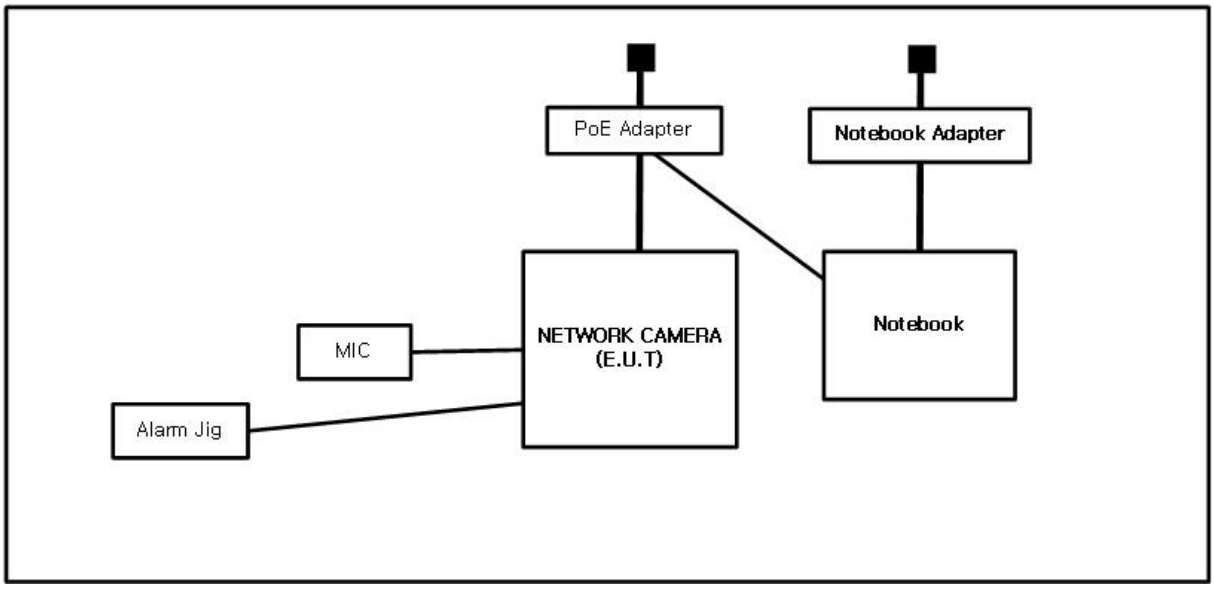
## 1.8 Configuration

■ AC Main
□ DC Main

- DC 12 V 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, Yeoju-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 | **FCC** | 3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements. | |
| JAPAN | **VCCI** | Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz | R-4308, C-4798, T-2311, G-914 |
| KOREA | **MSIP** | 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) | KR0100 |
| Canada | **IC** | 3 & 10 meter Open Area Test Sites and one conducted site | 4769B-1 |
| Europe | **CE** | 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 | **KOLAS** | 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) | KOREA LABORATORY ACCREDITATION SCHEME KOLAS TESTING NO. 489 |

# 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 55011:2009 +A1:2010 | ☐ Group 1<br>☐ Class A | ☐ Group 2<br>☐ Class B |
| ☐ EN 55014-1:2006 +A2:2011 | | |
| ☐ EN 55014-2:1997 +A2:2008 | | |
| ☐ EN 55015:2013 | | |
| ☐ EN 61547 :2009 | | |
| ☒ EN 55022:2010 | ☒ 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 | | |

☐ **VCCI V-3 / 2015.04** ☐ Class A ☐ Class B

☐ **AS / NZS CISPR22:2009 +A1:2010** ☐ Class A ☐ Class B

☐ **47 CFR Part 15, Subpart B**

- ☐ CISPR 22:2009 +A1:2010 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2009

☐ **IC Regulation ICES-003 : 2016**

- ☐ CAN/CSA CISPR 22-10 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ **CISPR 22:2009 +A1:2010** ☐ Class A ☐ Class B

☐ **RE- Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ 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 |
|---|---|---|---|---|---|
| ☐ | EMI Test Receiver | ESR3 | R & S | 101783 | 05, 03, 2017 |
| ☐ | LISN | ENV216 | R & S | 101137 | 02, 04, 2017 |
| ☐ | LISN | ENV216 | R & S | 101786 | 05, 02, 2017 |
| ☐ | Electro wave Shieldroom | - | SEMITEC | - | - |

**Test Conditions**
Temperature: ℃
Relative Humidity: %

.

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

**Instrument Settings**
IF Band Width: 9 ㎑

**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. 29, 2016

**Test Location**
Electro wave Shieldroom

**Test Equipment**

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

**Test Conditions**
Temperature: 23,8 ℃
Relative Humidity: 49,2 %

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

**Instrument Settings**
IF Band Width: 9 ㎑

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

# 2.3 Radiated Electric Field Emissions(Below 1 ㎓)

**Test Date**
Jul. 01, 2016

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

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI TEST Receiver | ESR3 | R&S | 101781 | 05, 03, 2017 |
| ☒ | Trilog-Broadband ANT | VULB 9163 | Schwarzbeck | 9163-713 | 05, 15, 2017 |
| ☒ | OATS | - | KES | - | - |
| ☒ | Antenna Mast | - | DAEIL EMC | - | - |
| ☒ | Turn Table | - | DAEIL EMC | - | - |

**Test Conditions**
Temperature: 20,4 ℃
Relative Humidity: 76,0 %

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

**Instrument Settings**
IF Band Width: 120 ㎑

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

# 2.4 Radiated Electric Field Emissions(Above 1 ㎓)

**Test Date**
Jul. 01, 2016

**Test Location**
Semi Anachoic Chamber #2

**Test Equipment**

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

**Test Conditions**
Temperature: 23,7 ℃
Relative Humidity: 53,4 %

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

**Instrument Settings**
IF Band Width: 1 ㎒

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

# 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 |
|---|---|---|---|---|---|
| ☐ | AC Source | ACS 500 N | EM TEST | V1024106760 | 08, 13, 2016 |
| ☐ | Digital Power Analyzer | DPA 500 N | EM TEST | V1024106759 | 08, 13, 2016 |

**Test Conditions**
Temperature: ℃
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 |
|---|---|---|---|---|---|
| ☐ | AC Source | ACS 500 N | EM test | V1024106760 | 08, 13, 2016 |
| ☐ | Digital Power Analyzer | DPA 500 N | EM test | V1024106759 | 08, 13, 2016 |

### Test Conditions
Temperature: ℃
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 $dB\mu V$.

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 $dB\mu V$, 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 $dB\mu V$, 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 $dB\mu V$.

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**
Jul. 03, 2016

**Test Location**
EMS-ESD: Electro wave Shieldroom

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | ESD SIMULATOR | ESS-2000 | Noise Ken | ESS05X4620 | 02, 24, 2017 |
| ☒ | HCP | - | Noise Ken | - | - |
| ☒ | VCP | - | Noise Ken | - | - |

**Test Conditions**
Temperature: 21,9 ℃
Relative Humidity: 50,8 %
Atmospheric Pressure: 99,1 kPa

**Test Specifications**
Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:

| Contact | Air | HCP | VCP |
|---|---|---|---|
| ☐ 2 kV | ☒ 2 kV | ☐ 2 kV | ☐ 2 kV |
| ☐ 4 kV | ☒ 4 kV | ☐ 4 kV | ☐ 4 kV |
| ☒ 6 kV | ☐ 6 kV | ☒ 6 kV | ☒ 6 kV |
| ☐ 8 kV | ☒ 8 kV | ☐ 8 kV | ☐ 8 kV |
| ☐ 15 kV | ☐ 15 kV | ☐ 15 kV | ☐ 15 kV |

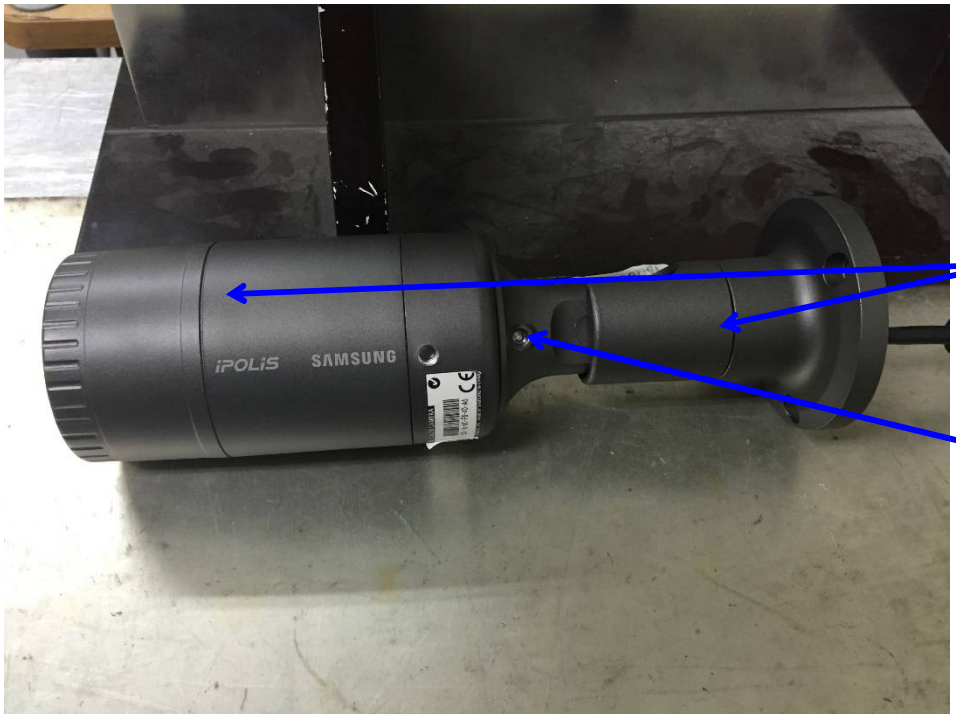
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

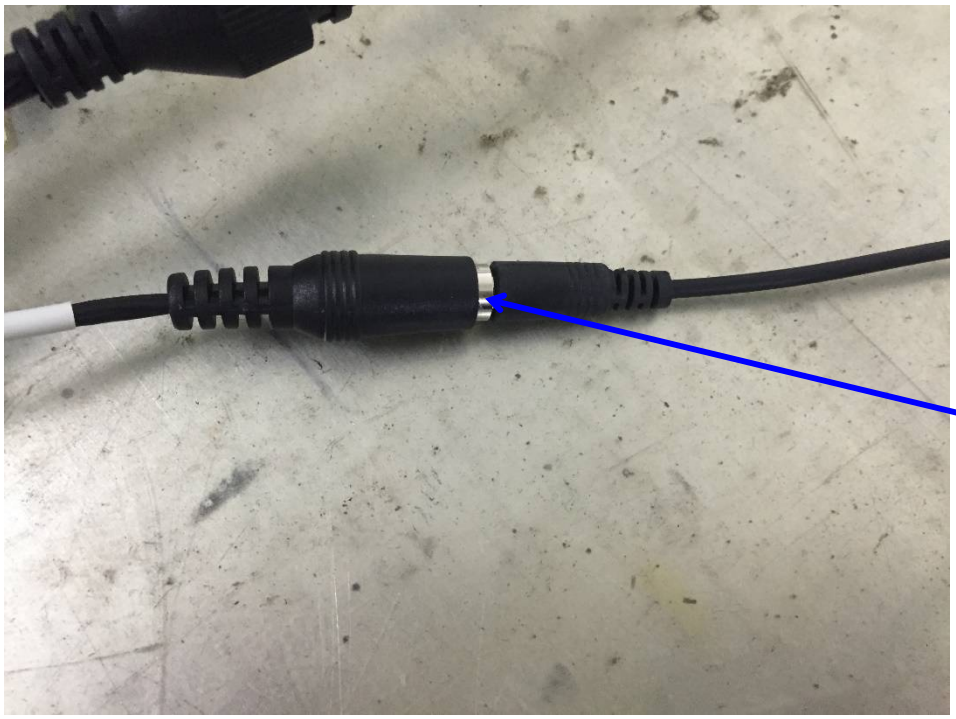
Required Performance Criteria: ☒ Complied

## Location of Discharge:

Air
Contact

■ DC 12 V, PoE Mode



## Test Data

- DC 12 V Mode

Indirect Discharge

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

Direct Discharge

| No. | Test Point | Discharge Method | Performance Observation | ReMarks |
|---|---|---|---|---|
| 1 | Screw | Contact Discharge | Complied | - |
| 2 | MIC Port | Contact Discharge | Complied | - |
| 3 | Enclosure | Contact Discharge | Complied | - |

- PoE Mode

Indirect Discharge

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

Direct Discharge

| No. | Test Point | Discharge Method | Performance Observation | ReMarks |
|---|---|---|---|---|
| 1 | Screw | Contact Discharge | Complied | - |
| 2 | MIC Port | Contact Discharge | Complied | - |
| 3 | Enclosure | Contact Discharge | Complied | - |

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

## Test Results

☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

## ReMarks

PASS Required Performance Criteria

# 3.2 Radiated Electric Field Immunity

**Reference Standard**
EN 61000-4-3:2006 +A2:2010

**Test Date**
Jun. 30, 2016

**Test Location**
EMS-RS: ☐ Semi Anachoic Chamber #1 ☒ Semi Anachoic Chamber #2

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | SIGNAL GENERATOR | SMB 100A | Rohde & Schwarz | 108252 | 08, 13, 2016 |
| ☒ | BROADBAND AMPLIFIER | BBA100 | Rohde & Schwarz | 101239 | 08, 13, 2016 |
| ☒ | BROADBAND AMPLIFIER | 100S1G6M1 | AR | 579931 | 08, 13, 2016 |
| ☒ | POWER METER | NRP2 | Rohde & Schwarz | 103475 | 08, 13, 2016 |
| ☒ | AVG POWER SENSOR | NRP-Z91 | Rohde & Schwarz | 102526 | 08, 13, 2016 |
| ☒ | AVG POWER SENSOR | NRP-Z91 | Rohde & Schwarz | 102527 | 08, 13, 2016 |
| ☒ | Stacked Log.-Per.Antenna | STLP 9128 D | Schwarzbeck | 9128D038 | - |
| ☒ | DIRECTIONAL COUPLER | KYDC-D1070-DX40 | Kytelecom Co., Ltd. | KY150001 | 09, 25, 2016 |
| ☒ | Semi Anachoic Chamber #2 | - | SEMITEC | - | - |

**Test Conditions**

| | |
|---|---|
| Temperature: | 23,9 ℃ |
| Relative Humidity: | 49,4 % |
| Atmospheric Pressure: | 99,0 kPa |

## Test Conditions

Temperature: 23,9 ℃
Relative Humidity: 49,4 %
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

- DC 12 V Mode

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

- 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

# 3.3 Electrical Fast Transients/Bursts

**Reference Standard**
EN 61000-4-4:2012

**Test Date**
Jul. 03, 2016

**Test Location**
EMS-EFT: Electro wave Shieldroom

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | Ultra Compact Simulator | UCS 500 N5 | EM TEST | V0936105120 | 06, 27, 2017 |
| ☒ | Capacitive Coupling Clamp | HFK | EM TEST | 070925 | 06, 27, 2017 |
| ☒ | Motor Variac | MV2616 | EM TEST | V0936105123 | 06, 27, 2017 |

**Test Conditions**

| | |
|---|---|
| Temperature: | 21,9 ℃ |
| Relative Humidity: | 50,8 % |
| Atmospheric Pressure: | 99,1 ㎪ |

**Test Specifications**

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

## Test Data

- DC 12 V Mode

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

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

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

| Mode of Application | OBSERVATIONS | |
|---|---|---|
| | (+) Burst (㎸) | (-) Burst (㎸) |
| L1 – L2 | Complied | Complied |

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

- PoE Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | OBSERVATIONS | |
|---|---|---|
| | (+) Burst (㎸) | (-) Burst (㎸) |
| RJ – 45 | 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**
Jul. 03, 2016

**Test Location**
EMS-Surge: Electro wave Shieldroom

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | Ultra Compact Simulator | UCS 500 N5 | EM TEST | V0936105120 | 06, 27, 2017 |
| ☒ | Motor Variac | MV2616 | EM TEST | V0936105123 | 06, 27, 2017 |
| ☐ | CDN | CNV 504N | EM TEST | V0936105121 | 03, 25, 2017 |
| ☒ | CDN | CNV 508N1 | EM TEST | P1551168979 | 04, 27, 2017 |
| ☐ | CDN | CNV 508T5 | EM TEST | P1549168422 | 04, 27, 2017 |

**Test Conditions**
Temperature: 21,9 ℃
Relative Humidity: 50,8 %
Atmospheric Pressure: 99,1 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

- DC 12 V Mode

### Power Lines

☐ 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) |
| RJ – 45 | Complied | Complied |
| Alarm | Complied | Complied |

- PoE Mode

**Power Lines**

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

**Signal Lines**

☒ Line to Earth – Common Mode

| Mode of Application | OBSERVATIONS | |
|---|---|---|
| | (+) Surge (㎸) | (-) Surge (㎸) |
| RJ – 45 | 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**
Jun. 29, 2016

**Test Location**
EMS-CS: Electro wave Shieldroom

**Test Equipment**

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

**Test Conditions**
Temperature: 23,8 ℃
Relative Humidity: 49,2 %
Atmospheric Pressure: 99,0 kPa

## Test Specifications

| | | |
|---|---|---|
| Frequency range: | ☒ 150 ㎑ to 100 ㎒ | ☐ 10 ㎑ to 30 ㎒ |
| | ☐ 150 ㎑ to 230 ㎒ | ☐ 10 ㎑ to 100 ㎒ |
| Voltage Level: | ☐ 1 Vrms | ☐ 3 Vrms |
| | ☒ 10 Vrms | |
| Modulation: | ☒ AM, 80 %, 1 ㎑ sine wave | |
| | ☒ PM, 1 ㎐ (0,5 s ON : 0,5 s OFF) | |
| Frequency step: | ☒ 1 % step | |
| Dwell Time: | ☒ 1 s | ☐ 3 s |
| Required Performance Criteria: | ☒ Complied | |

## Test Data

- DC 12 V Mode

☐ Input a.c. power ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| - | CDN (☐M2, ☐M3) | - |

☒ Input d.c. power ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| L1 – L2 | CDN (☒M2, ☐M3) | Complied |

☒ Signal ports and telecommunication ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| RJ – 45 | EM Injection Clamp | Complied |
| Alarm | EM Injection Clamp | Complied |

- PoE Mode

☐ Input a.c. power ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| - | CDN (☐M2, ☐M3) | - |

☐ Input d.c. power ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| - | CDN (☐M2, ☐M3) | - |

☒ Signal ports and telecommunication ports

| Coupling Location (Line Stressed) | Coupling Method | Observation |
|---|---|---|
| RJ – 45 | EM Injection Clamp | Complied |
| Alarm | EM Injection Clamp | Complied |

Notes: CDN = Coupling DecMoupling 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 |
|---|---|---|---|---|---|
| ☐ | Ultra Compact Simulator | UCS 500 N5 | EM TEST | V0936105120 | 06, 27, 2017 |
| ☐ | Motor Variac | MV2616 | EM TEST | V0936105123 | 06, 27, 2017 |

**Test Conditions**
Temperature: ℃
Relative Humidity: %
Atmospheric Pressure: kPa

## Test Specifications & Observations/ReMarks

| Test Level | Duration [in period/ms (50 ㎐)] | Results |
|---|---|---|
| ☐ 20 % dip | ☐ 250 /5000 | _____ |
| ☐ 30 % dip | ☐ 25 /500 | _____ |
| ☐ 60 % dip | ☐ 10 /200 | _____ |
| ☐ 100 % dip | ☐ 250 /5000 | _____ |

- Voltage cariations

| | | |
|---|---|---|
| ☐ Unom + 10 % | ☐ 253 V (ac) | _____ |
| ☐ Unom - 15 % | ☐ 195.5 V (ac) | _____ |

Observations:
Complied – No degradation of function

**Test Results**

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

**ReMarks**

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

# APPENDIX A – TEST DATA

## Conducted Emissions at Mains Power Ports

**[HOT]**

N/A

**[NEUTRAL]**

N/A

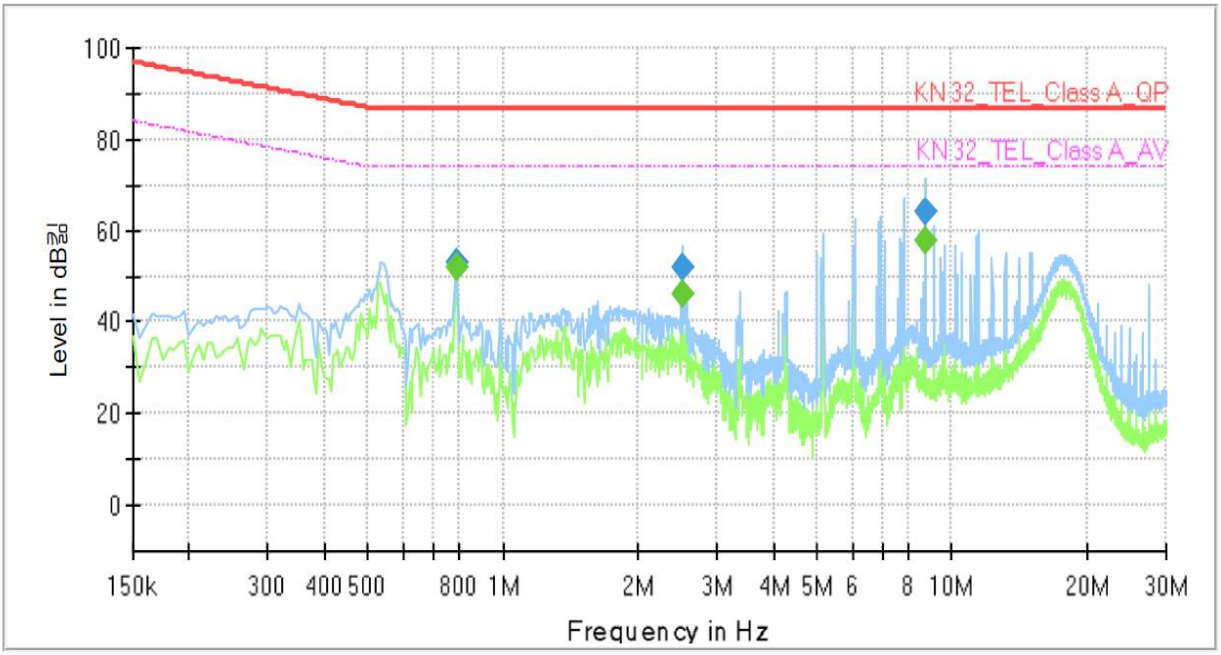
## Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

**[10 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QNO-7080RP |
| Mode | DC 12 V_10 Mbps |
| Operator Name: | KES |



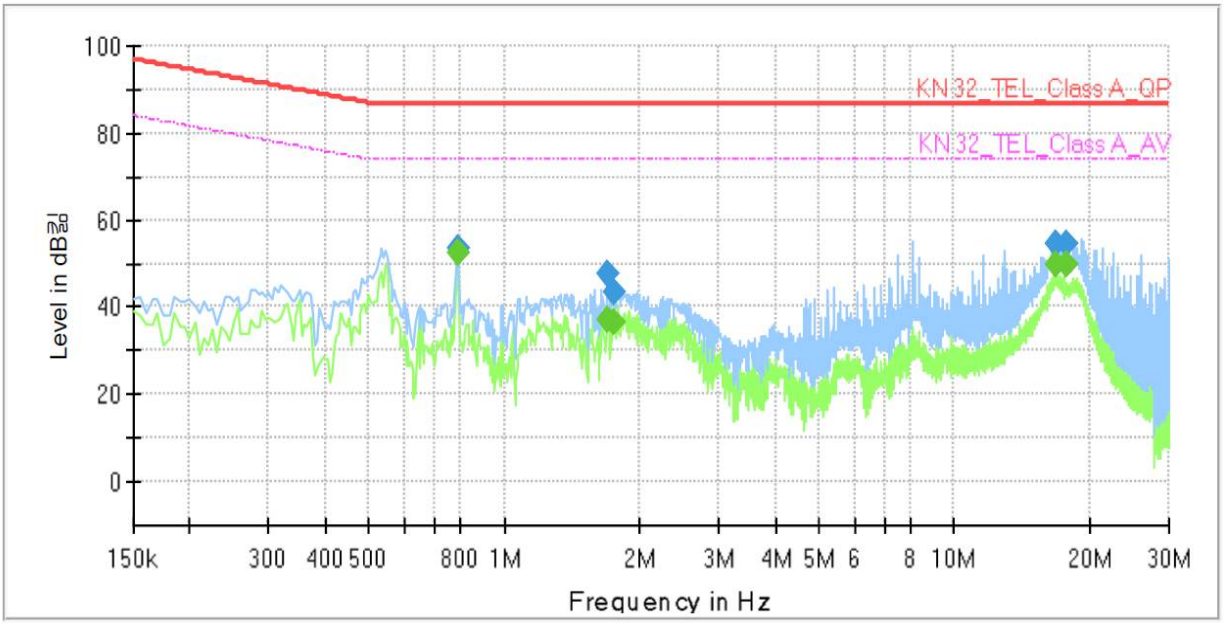

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.785000 | --- | 52.08 | 74.00 | 21.92 | 1000.0 | 9.000 | Single Line | 9.9 |
| 0.785000 | 53.06 | --- | 87.00 | 33.94 | 1000.0 | 9.000 | Single Line | 9.9 |
| 2.500000 | --- | 46.03 | 74.00 | 27.97 | 1000.0 | 9.000 | Single Line | 9.8 |
| 2.500000 | 51.99 | --- | 87.00 | 35.01 | 1000.0 | 9.000 | Single Line | 9.8 |
| 8.750000 | --- | 57.79 | 74.00 | 16.21 | 1000.0 | 9.000 | Single Line | 10.0 |
| 8.750000 | 64.05 | --- | 87.00 | 22.95 | 1000.0 | 9.000 | Single Line | 10.0 |

**[100 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QNO-7080RP |
| Mode | DC 12 V_100 Mbps |
| Operator Name: | KES |




## Final_Result

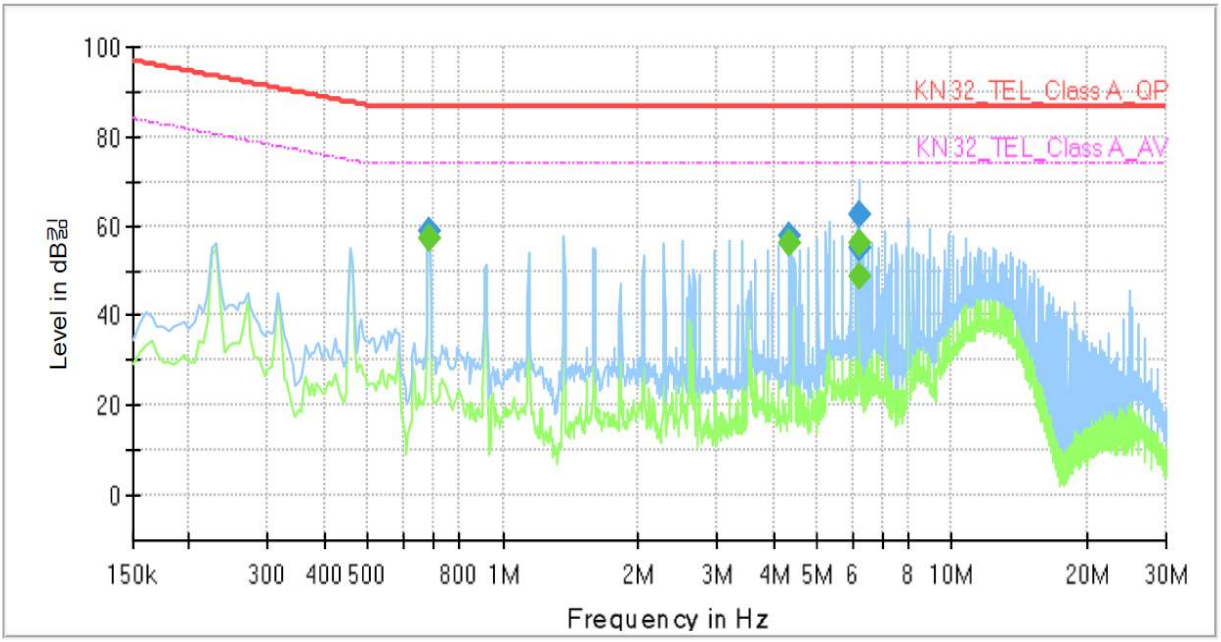
| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.785000 | --- | 52.35 | 74.00 | 21.65 | 1000.0 | 9.000 | Single Line | 9.4 |
| 0.785000 | 53.43 | --- | 87.00 | 33.57 | 1000.0 | 9.000 | Single Line | 9.4 |
| 1.690000 | --- | 37.18 | 74.00 | 36.82 | 1000.0 | 9.000 | Single Line | 9.3 |
| 1.690000 | 47.63 | --- | 87.00 | 39.37 | 1000.0 | 9.000 | Single Line | 9.3 |
| 1.755000 | --- | 36.69 | 74.00 | 37.31 | 1000.0 | 9.000 | Single Line | 9.3 |
| 1.755000 | 43.17 | --- | 87.00 | 43.83 | 1000.0 | 9.000 | Single Line | 9.3 |
| 16.810000 | --- | 49.69 | 74.00 | 24.31 | 1000.0 | 9.000 | Single Line | 9.6 |
| 16.810000 | 54.39 | --- | 87.00 | 32.61 | 1000.0 | 9.000 | Single Line | 9.6 |
| 17.830000 | --- | 49.96 | 74.00 | 24.04 | 1000.0 | 9.000 | Single Line | 9.5 |
| 17.830000 | 54.43 | --- | 87.00 | 32.57 | 1000.0 | 9.000 | Single Line | 9.5 |

- PoE Mode

**[10 Mbps]**

# Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QNO-7080RP |
| Mode | PoE_10 Mbps |
| Operator Name: | KES |



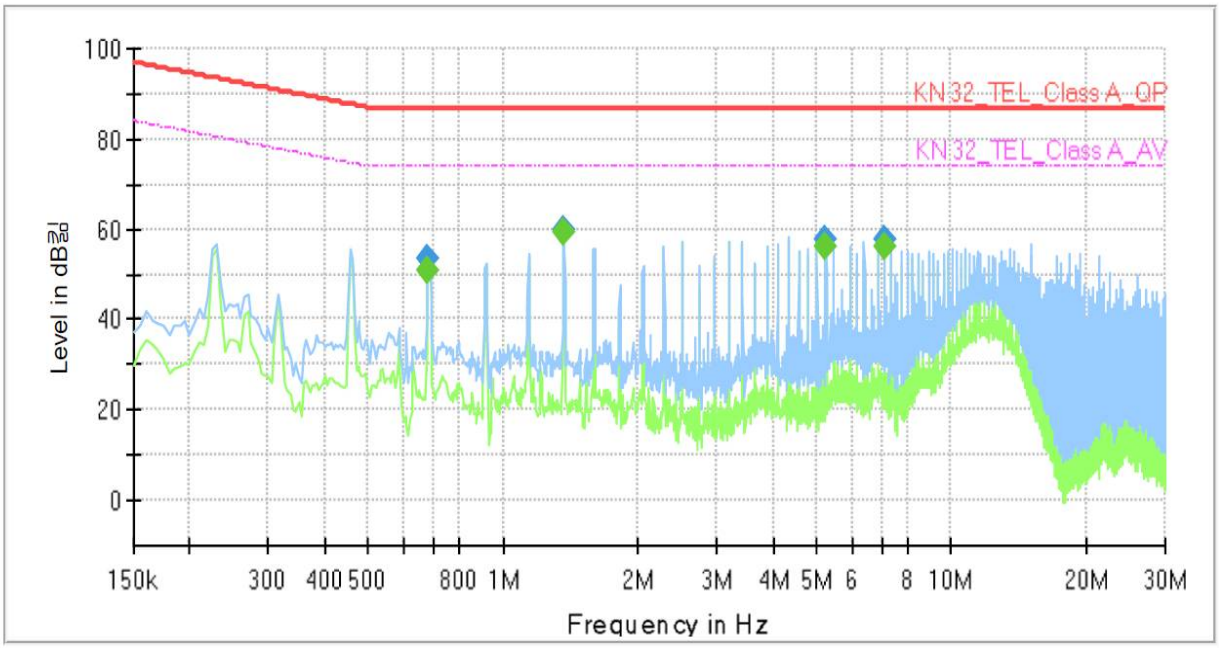

# Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.685000 | --- | 57.13 | 74.00 | 16.87 | 1000.0 | 9.000 | Single Line | 9.9 |
| 0.685000 | 59.01 | --- | 87.00 | 27.99 | 1000.0 | 9.000 | Single Line | 9.9 |
| 4.335000 | --- | 56.06 | 74.00 | 17.94 | 1000.0 | 9.000 | Single Line | 9.8 |
| 4.335000 | 57.44 | --- | 87.00 | 29.56 | 1000.0 | 9.000 | Single Line | 9.8 |
| 6.245000 | --- | 48.74 | 74.00 | 25.26 | 1000.0 | 9.000 | Single Line | 9.9 |
| 6.245000 | 54.84 | --- | 87.00 | 32.16 | 1000.0 | 9.000 | Single Line | 9.9 |
| 6.250000 | --- | 56.14 | 74.00 | 17.86 | 1000.0 | 9.000 | Single Line | 9.9 |
| 6.250000 | 62.22 | --- | 87.00 | 24.78 | 1000.0 | 9.000 | Single Line | 9.9 |

**[100 Mbps]**

# Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QNO-7080RP |
| Mode | PoE_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) |
|---|---|---|---|---|---|---|---|---|
| 0.680000 | --- | 51.04 | 74.00 | 22.96 | 1000.0 | 9.000 | Single Line | 9.4 |
| 0.680000 | 53.27 | --- | 87.00 | 33.73 | 1000.0 | 9.000 | Single Line | 9.4 |
| 1.370000 | --- | 59.34 | 74.00 | 14.66 | 1000.0 | 9.000 | Single Line | 9.3 |
| 1.370000 | 59.70 | --- | 87.00 | 27.30 | 1000.0 | 9.000 | Single Line | 9.3 |
| 5.250000 | --- | 55.99 | 74.00 | 18.01 | 1000.0 | 9.000 | Single Line | 9.4 |
| 5.250000 | 57.71 | --- | 87.00 | 29.29 | 1000.0 | 9.000 | Single Line | 9.4 |
| 7.075000 | --- | 56.11 | 74.00 | 17.89 | 1000.0 | 9.000 | Single Line | 9.5 |
| 7.075000 | 57.74 | --- | 87.00 | 29.26 | 1000.0 | 9.000 | Single Line | 9.5 |

## Radiated Electric Field Emissions(Below 1 ㎓)

- DC 12 V Mode

| Frequency | Amplitude | ANT Polar. (H/V) | ANT. Height | Correction Factor | | Corrected Amplitude | Applicable Limit | Jungin [dB] |
|---|---|---|---|---|---|---|---|---|
| [㎒] | [dBμV] | | [m] | ANT. [dB/m] | Cable [dB] | [dBμV/m] | [dBμV/m] | |
| 146.87 | 7.85 | V | 1.20 | 8.09 | 2.75 | 18.69 | 40.00 | 21.31 |
| 155.77 | 9.54 | V | 1.10 | 8.41 | 2.80 | 20.75 | 40.00 | 19.25 |
| 230.64 | 7.16 | H | 3.90 | 11.98 | 3.59 | 22.73 | 47.00 | 24.27 |
| 319.55 | 6.02 | H | 4.00 | 13.83 | 4.39 | 24.24 | 47.00 | 22.76 |
| 327.77 | 6.99 | H | 3.85 | 14.02 | 4.46 | 25.47 | 47.00 | 21.53 |
| 368.09 | 7.88 | V | 1.00 | 14.96 | 4.80 | 27.64 | 47.00 | 19.36 |

* H : Horizontal, V : Vertical

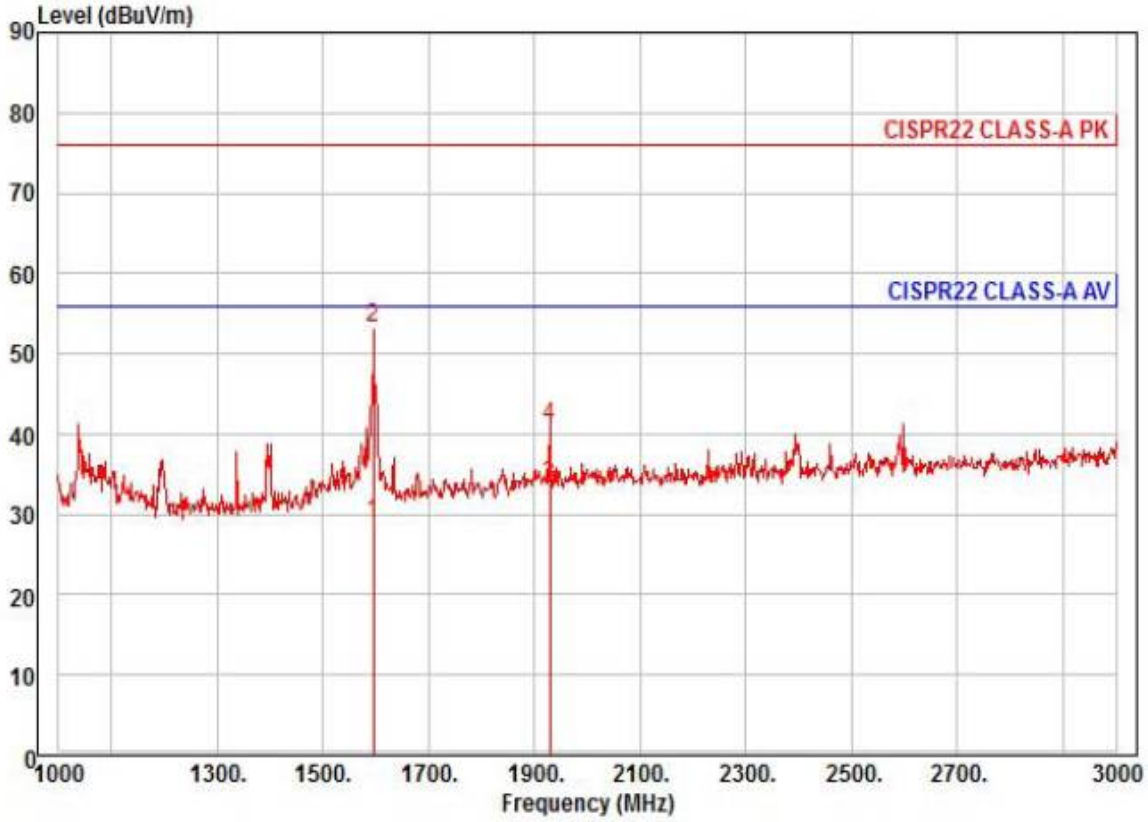
- PoE Mode

| Frequency | Amplitude | ANT Polar. (H/V) | ANT. Height | Correction Factor | | Corrected Amplitude | Applicable Limit | Jungin [dB] |
|---|---|---|---|---|---|---|---|---|
| [㎒] | [dBμV] | | [m] | ANT. [dB/m] | Cable [dB] | [dBμV/m] | [dBμV/m] | |
| 123.99 | 10.12 | H | 4.00 | 9.30 | 2.52 | 21.94 | 40.00 | 18.06 |
| 150.54 | 7.76 | V | 1.00 | 8.22 | 2.77 | 18.75 | 40.00 | 21.25 |
| 231.22 | 7.30 | H | 3.85 | 11.99 | 3.60 | 22.89 | 47.00 | 24.11 |
| 241.47 | 7.39 | V | 1.20 | 12.22 | 3.71 | 23.32 | 47.00 | 23.68 |
| 312.25 | 6.01 | V | 1.00 | 13.66 | 4.32 | 23.99 | 47.00 | 23.01 |
| 361.33 | 6.11 | H | 4.00 | 14.80 | 4.75 | 25.66 | 47.00 | 21.34 |

* H : Horizontal, V : Vertical

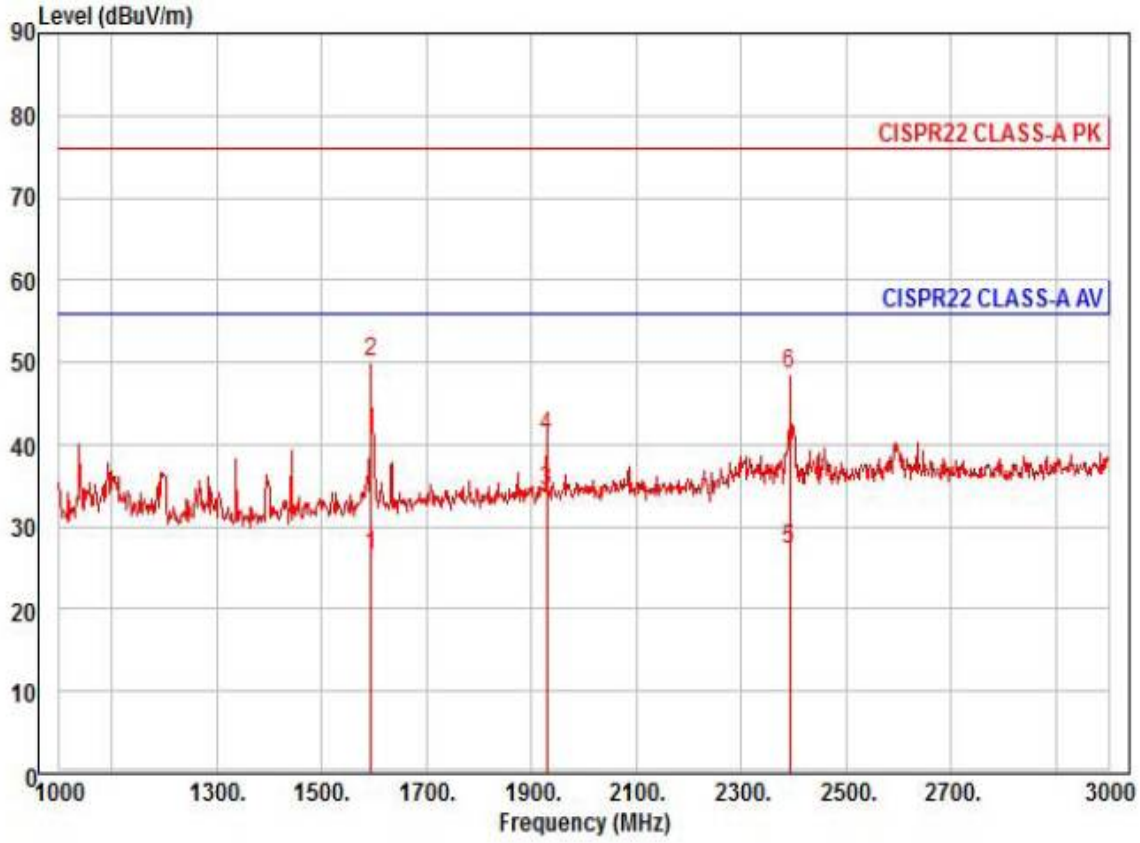
## Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



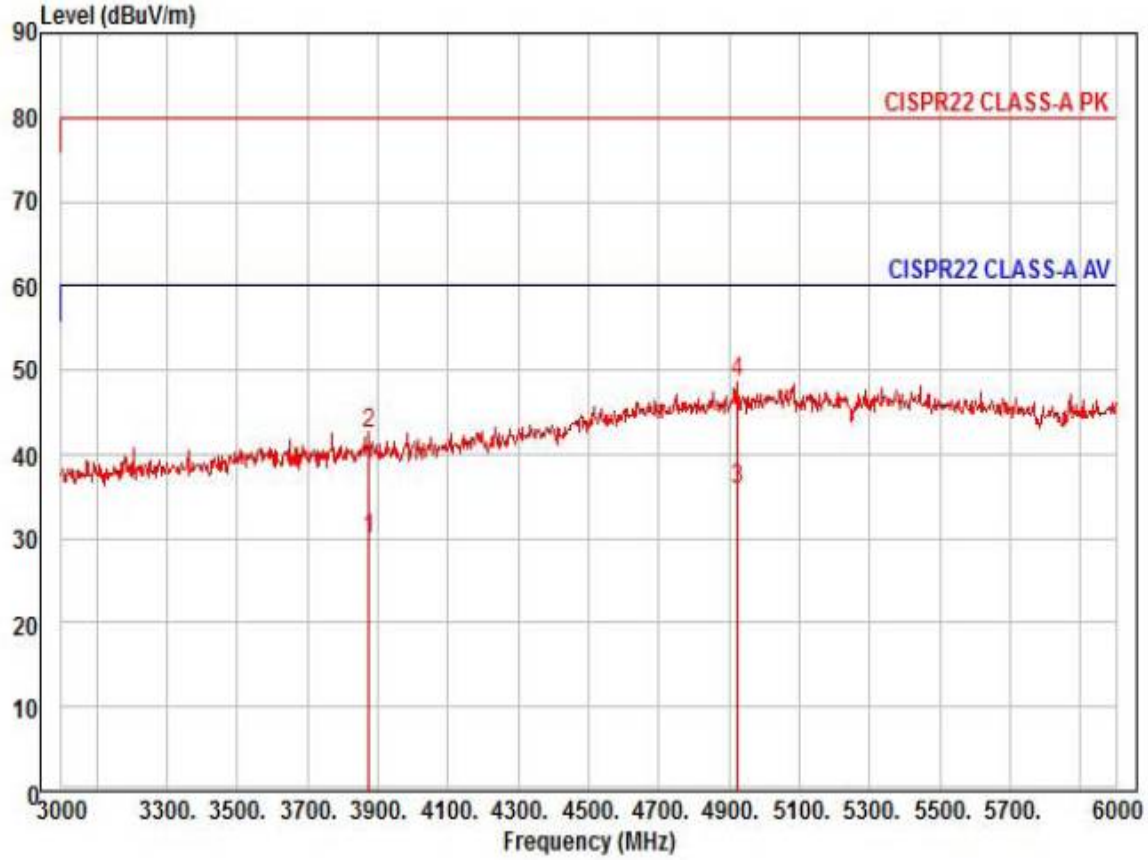

Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : DC 12 V
Memo :

| | 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 | 1596.00 | 34.22 | 26.28 | 8.24 | 39.83 | 110 | 56.00 | -27.09 | horizontal | Average |
| 2 pk | 1596.00 | 58.49 | 26.28 | 8.24 | 39.83 | 110 | 76.00 | -22.82 | horizontal | Peak |
| 3 pp | 1930.00 | 36.55 | 27.60 | 9.16 | 39.66 | 204 | 56.00 | -22.35 | horizontal | Average |
| 4 | 1930.00 | 43.86 | 27.60 | 9.16 | 39.66 | 204 | 76.00 | -35.04 | horizontal | Peak |



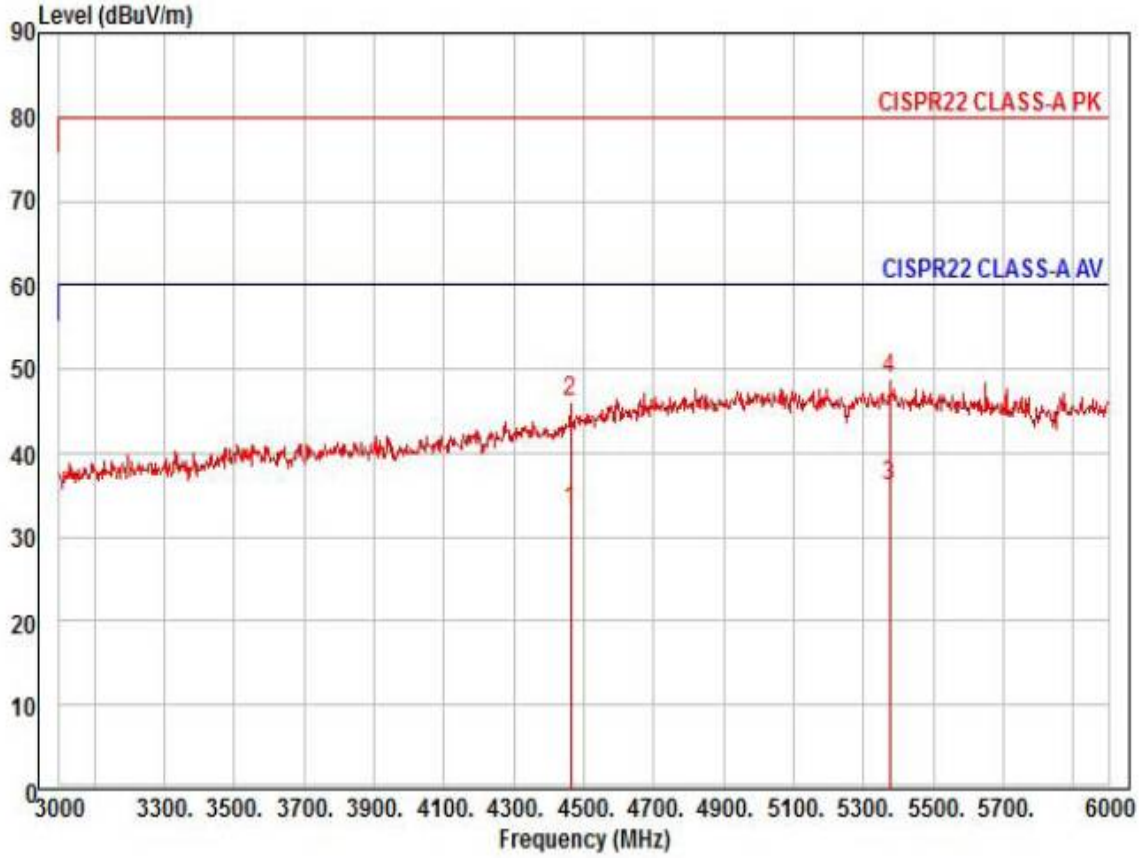

Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : DC 12 V
Memo :

| | 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 | 1594.00 | 31.71 | 26.27 | 8.23 | 39.83 | 235 | 56.00 | -29.62 | vertical | Average |
| 2 pk | 1594.00 | 55.28 | 26.27 | 8.23 | 39.83 | 235 | 76.00 | -26.05 | vertical | Peak |
| 3 pp | 1930.00 | 37.24 | 27.60 | 9.16 | 39.66 | 196 | 56.00 | -21.66 | vertical | Average |
| 4 | 1930.00 | 43.95 | 27.60 | 9.16 | 39.66 | 196 | 76.00 | -34.95 | vertical | Peak |
| 5 | 2392.00 | 28.27 | 28.84 | 9.95 | 39.86 | 213 | 56.00 | -28.80 | vertical | Average |
| 6 | 2392.00 | 49.58 | 28.84 | 9.95 | 39.86 | 213 | 76.00 | -27.49 | vertical | Peak |




Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : DC 12 V
Memo :

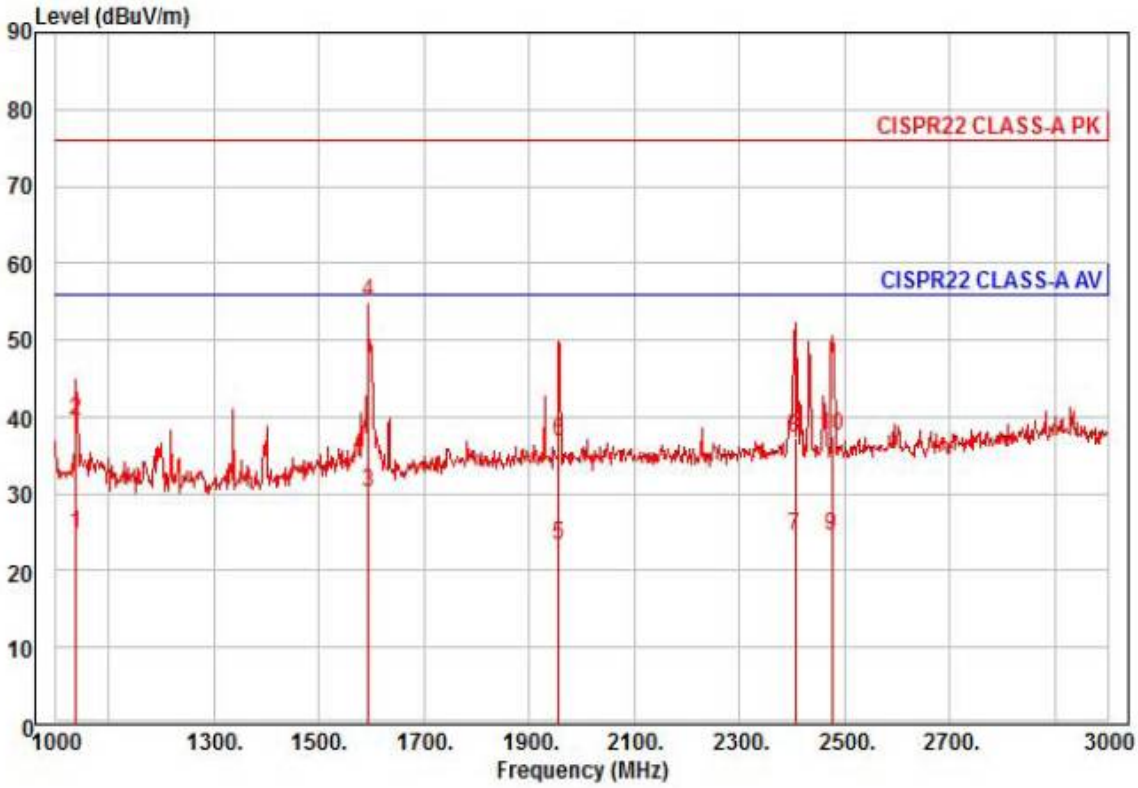
| | Freq | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | deg | dBuV/m | dB | | |
| 1 | 3876.00 | 25.35 | 31.80 | 13.26 | 40.39 | 122 | 60.00 | -29.98 | horizontal | Average |
| 2 | 3876.00 | 37.84 | 31.80 | 13.26 | 40.39 | 122 | 80.00 | -37.49 | horizontal | Peak |
| 3 pp | 4923.00 | 23.82 | 37.28 | 15.19 | 40.41 | 247 | 60.00 | -24.12 | horizontal | Average |
| 4 pk | 4923.00 | 36.56 | 37.28 | 15.19 | 40.41 | 247 | 80.00 | -31.38 | horizontal | Peak |




Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : DC 12 V
Memo :

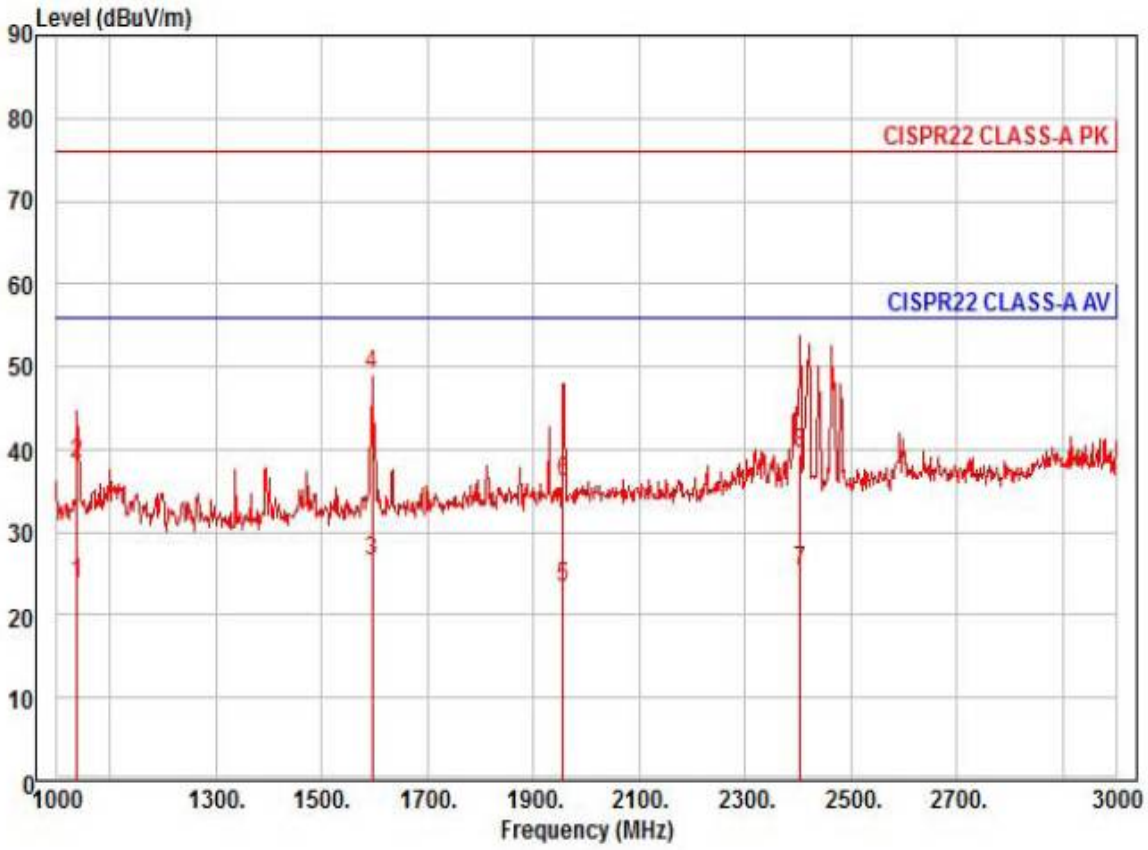
| | Freq | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | deg | dBuV/m | dB | | |
| 1 | 4461.00 | 24.55 | 34.64 | 14.36 | 40.41 | 270 | 60.00 | -26.86 | vertical | Average |
| 2 | 4461.00 | 37.60 | 34.64 | 14.36 | 40.41 | 270 | 80.00 | -33.81 | vertical | Peak |
| 3 pp | 5376.00 | 23.60 | 36.96 | 15.77 | 40.36 | 322 | 60.00 | -24.03 | vertical | Average |
| 4 pk | 5376.00 | 36.33 | 36.96 | 15.77 | 40.36 | 322 | 80.00 | -31.30 | vertical | Peak |

- PoE Mode



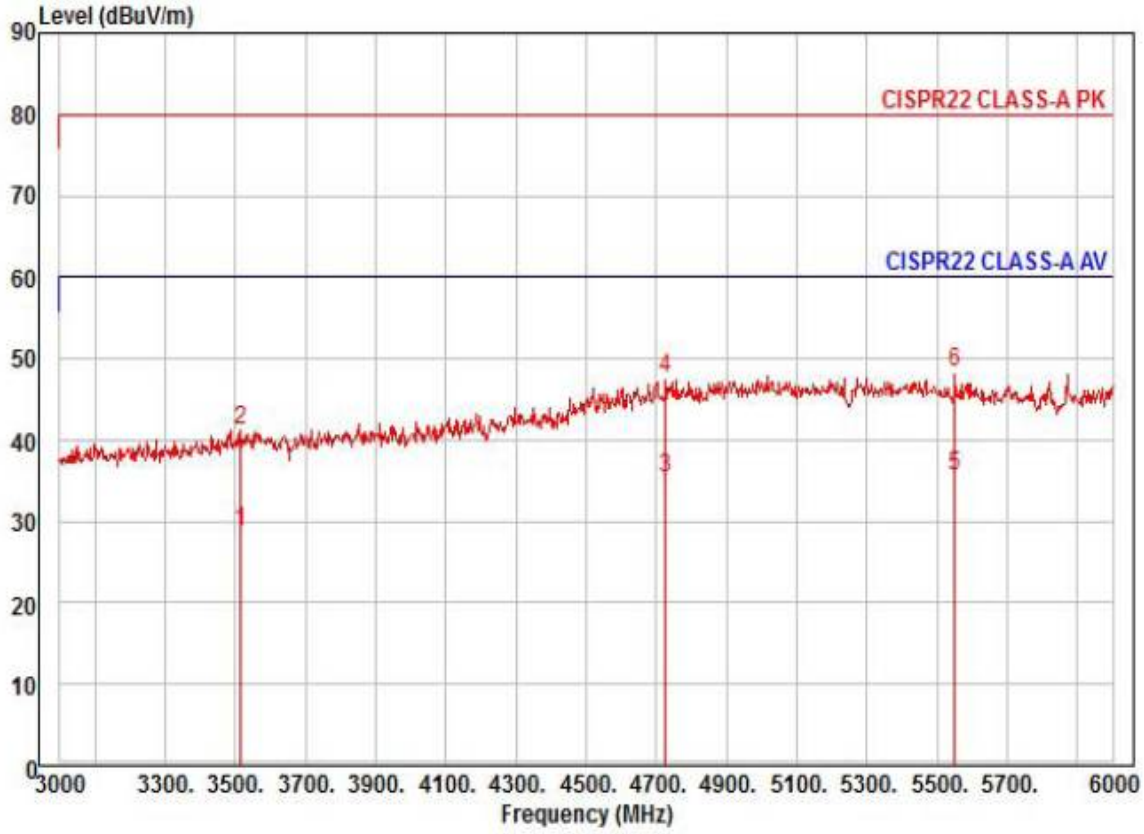

Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : PoE
Memo :

| | 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 | 1038.00 | 34.15 | 24.06 | 6.62 | 40.10 | 60 | 56.00 | -31.27 | horizontal | Average |
| 2 | 1038.00 | 48.81 | 24.06 | 6.62 | 40.10 | 60 | 76.00 | -36.61 | horizontal | Peak |
| 3 av | 1594.00 | 35.41 | 26.27 | 8.23 | 39.83 | 275 | 56.00 | -25.92 | horizontal | Average |
| 4 pp | 1594.00 | 60.32 | 26.27 | 8.23 | 39.83 | 275 | 76.00 | -21.01 | horizontal | Peak |
| 5 | 1956.00 | 26.10 | 27.71 | 9.23 | 39.65 | 247 | 56.00 | -32.61 | horizontal | Average |
| 6 | 1956.00 | 39.60 | 27.71 | 9.23 | 39.65 | 247 | 76.00 | -39.11 | horizontal | Peak |
| 7 | 2406.00 | 25.56 | 28.87 | 9.97 | 39.87 | 345 | 56.00 | -31.47 | horizontal | Average |
| 8 | 2406.00 | 38.34 | 28.87 | 9.97 | 39.87 | 345 | 76.00 | -38.69 | horizontal | Peak |
| 9 | 2476.00 | 25.38 | 29.05 | 10.08 | 39.91 | 282 | 56.00 | -31.40 | horizontal | Average |
| 10 | 2476.00 | 38.20 | 29.05 | 10.08 | 39.91 | 282 | 76.00 | -38.58 | horizontal | Peak |



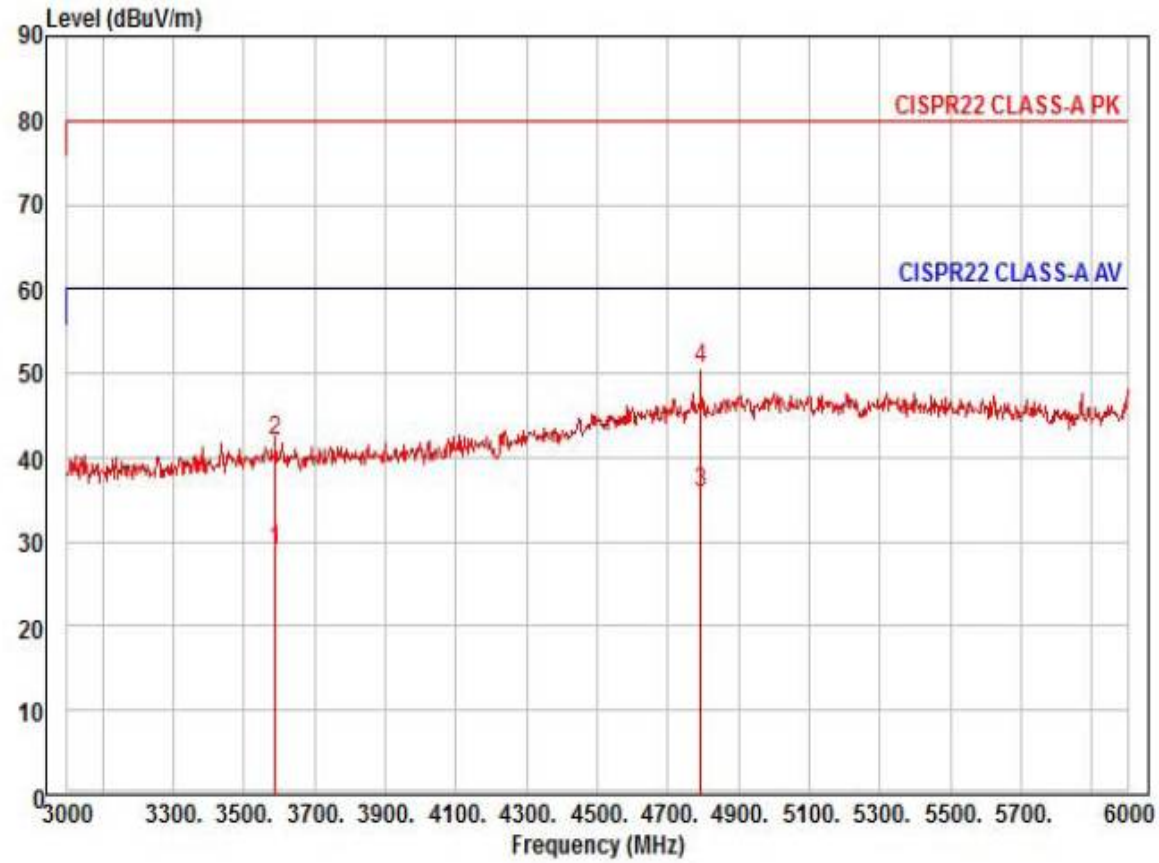

Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : QNO-7080RP
Mode : PoE
Memo :

| | 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 | 1038.00 | 33.15 | 24.06 | 6.62 | 40.10 | 336 | 56.00 | -32.27 | vertical | Average |
| 2 | 1038.00 | 47.69 | 24.06 | 6.62 | 40.10 | 336 | 76.00 | -37.73 | vertical | Peak |
| 3 av | 1596.00 | 31.84 | 26.28 | 8.24 | 39.83 | 289 | 56.00 | -29.47 | vertical | Average |
| 4 pp | 1596.00 | 54.24 | 26.28 | 8.24 | 39.83 | 289 | 76.00 | -27.07 | vertical | Peak |
| 5 | 1956.00 | 26.11 | 27.71 | 9.23 | 39.65 | 98 | 56.00 | -32.60 | vertical | Average |
| 6 | 1956.00 | 38.88 | 27.71 | 9.23 | 39.65 | 98 | 76.00 | -39.83 | vertical | Peak |
| 7 | 2404.00 | 26.40 | 28.87 | 9.97 | 39.86 | 162 | 56.00 | -30.62 | vertical | Average |
| 8 | 2404.00 | 40.55 | 28.87 | 9.97 | 39.86 | 162 | 76.00 | -36.47 | vertical | Peak |




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

| | 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 | 3516.00 | 25.22 | 31.20 | 12.54 | 40.31 | 262 | 60.00 | -31.35 | horizontal | Average |
| 2 | 3516.00 | 37.76 | 31.20 | 12.54 | 40.31 | 262 | 80.00 | -38.81 | horizontal | Peak |
| 3 | 4725.00 | 24.68 | 36.15 | 14.84 | 40.41 | 225 | 60.00 | -24.74 | horizontal | Average |
| 4 | 4725.00 | 36.93 | 36.15 | 14.84 | 40.41 | 225 | 80.00 | -32.49 | horizontal | Peak |
| 5 pp | 5550.00 | 23.33 | 36.61 | 16.01 | 40.33 | 89 | 60.00 | -24.38 | horizontal | Average |
| 6 pk | 5550.00 | 35.93 | 36.61 | 16.01 | 40.33 | 89 | 80.00 | -31.78 | horizontal | Peak |




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

| | 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 | 3588.00 | 25.33 | 31.32 | 12.69 | 40.33 | 192 | 60.00 | -30.99 | vertical | Average |
| 2 | 3588.00 | 38.29 | 31.32 | 12.69 | 40.33 | 192 | 80.00 | -38.03 | vertical | Peak |
| 3 pp | 4794.00 | 24.68 | 36.54 | 14.96 | 40.41 | 190 | 60.00 | -24.23 | vertical | Average |
| 4 pk | 4794.00 | 39.32 | 36.54 | 14.96 | 40.41 | 190 | 80.00 | -29.59 | vertical | Peak |

## Harmonic Current Emissions and Voltage Fluctuations and Flicker

### *Average harmonic current results*

| Hn | Ieff [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.

Test Data - Harmonics (continued)

## *Maximum harmonic current results*

| Hn | Ieff [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.

Test Data - Voltage Fluctuations

# Maximum Flicker results

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

# Test Setup Photos and Configuration

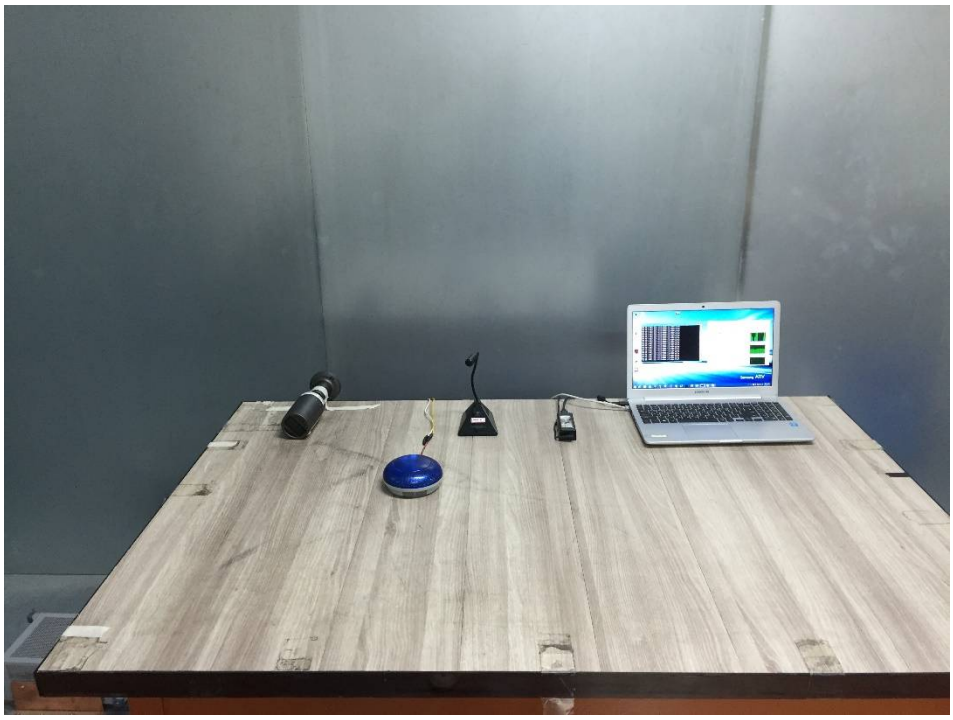
## Conducted Voltage Emissions

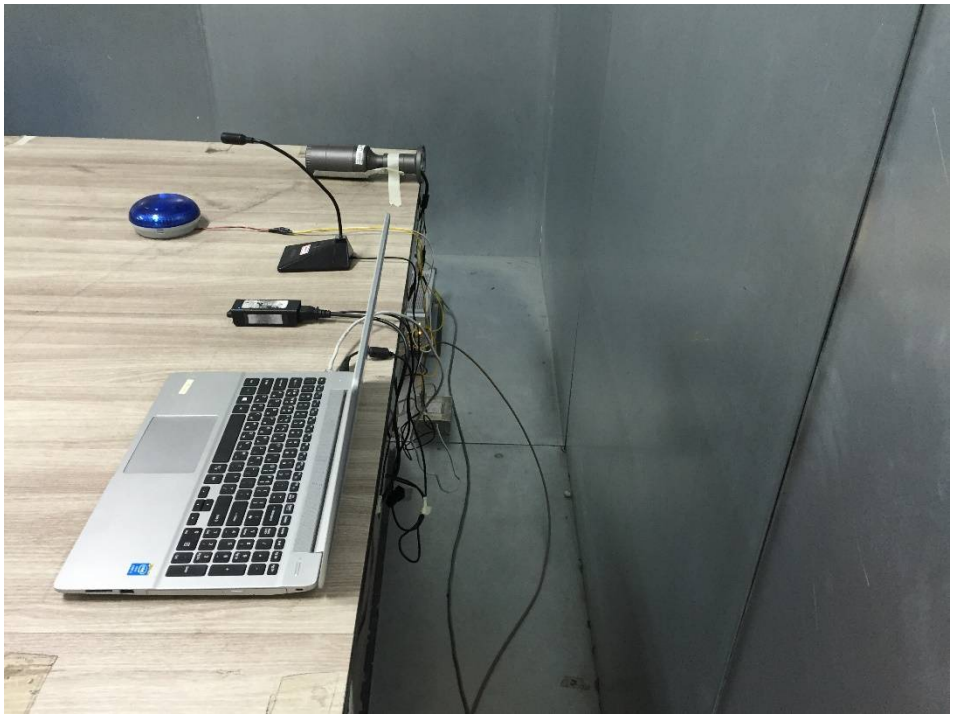
N/A

N/A

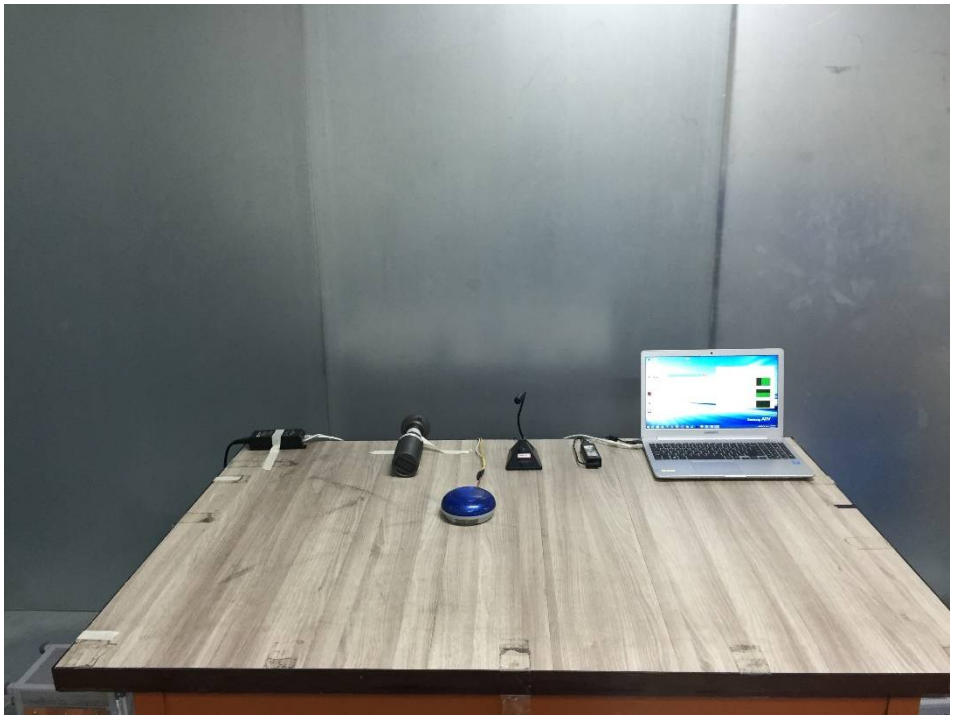
## Conducted Telecommunication Emissions

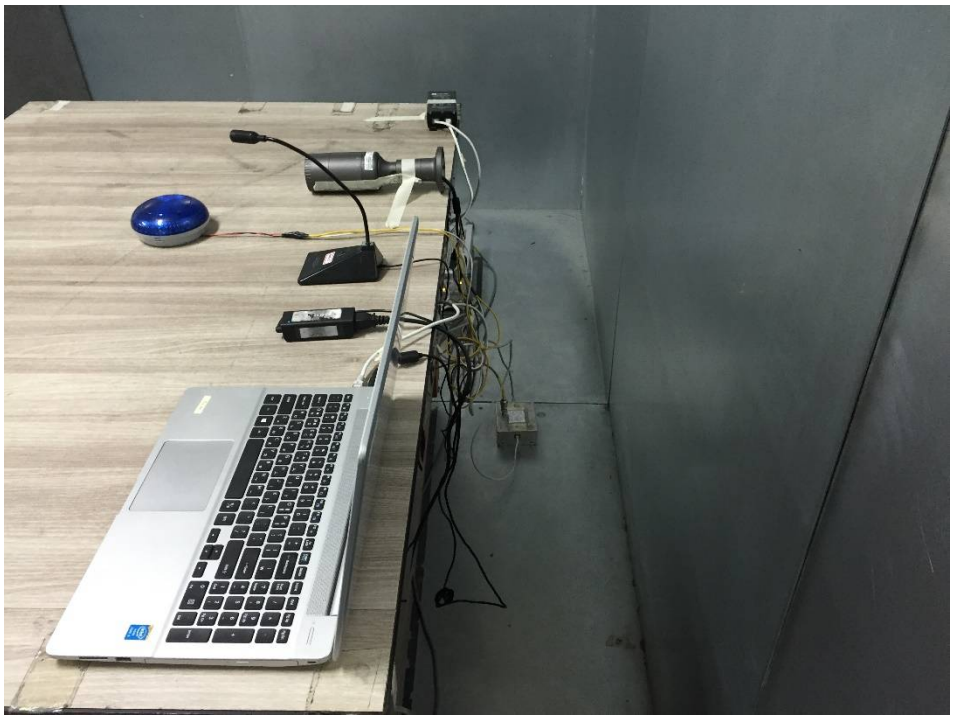
- DC 12 V Mode





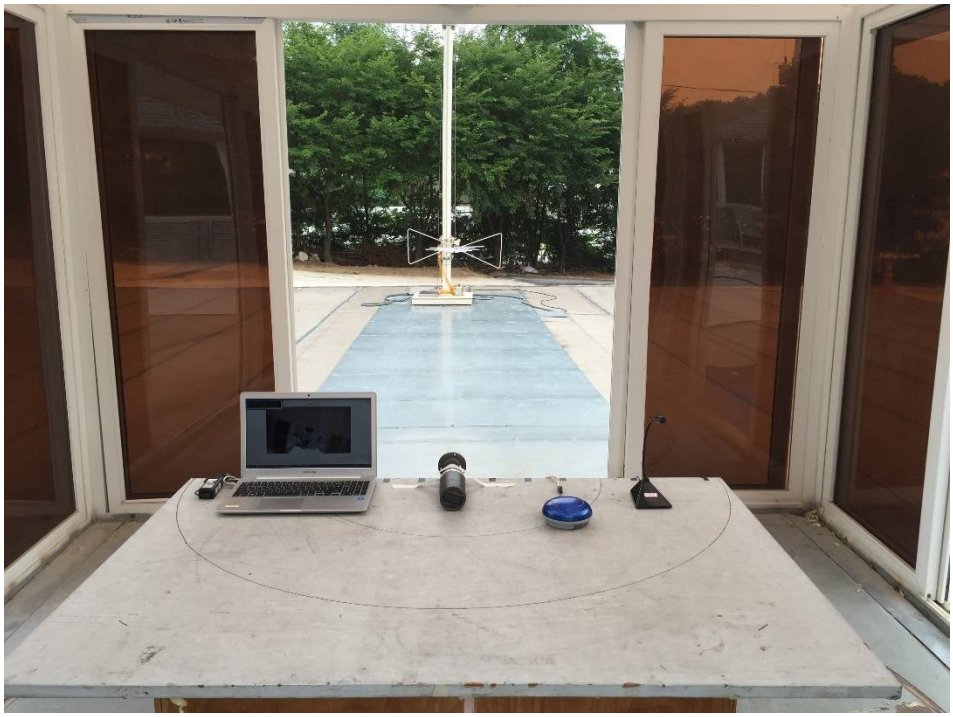
- PoE Mode





## Radiated Electric Field Emissions(Below 1 ㎓)

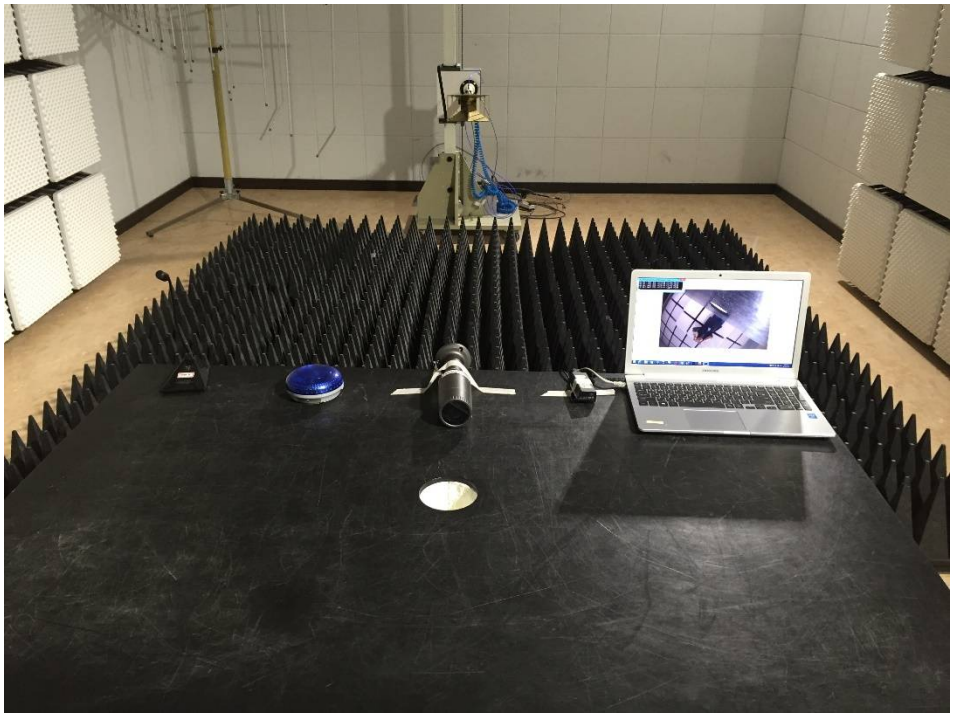
- DC 12 V Mode



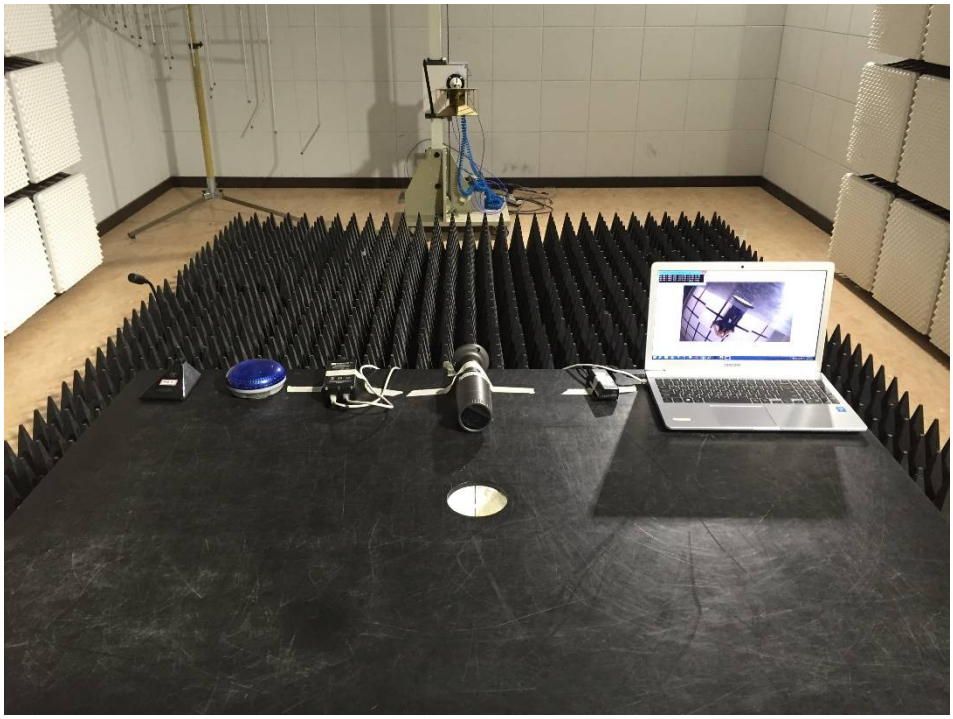
- PoE Mode

## Radiated Electric Field Emissions(Above 1 ㎓)

- DC 12 V Mode



- PoE Mode

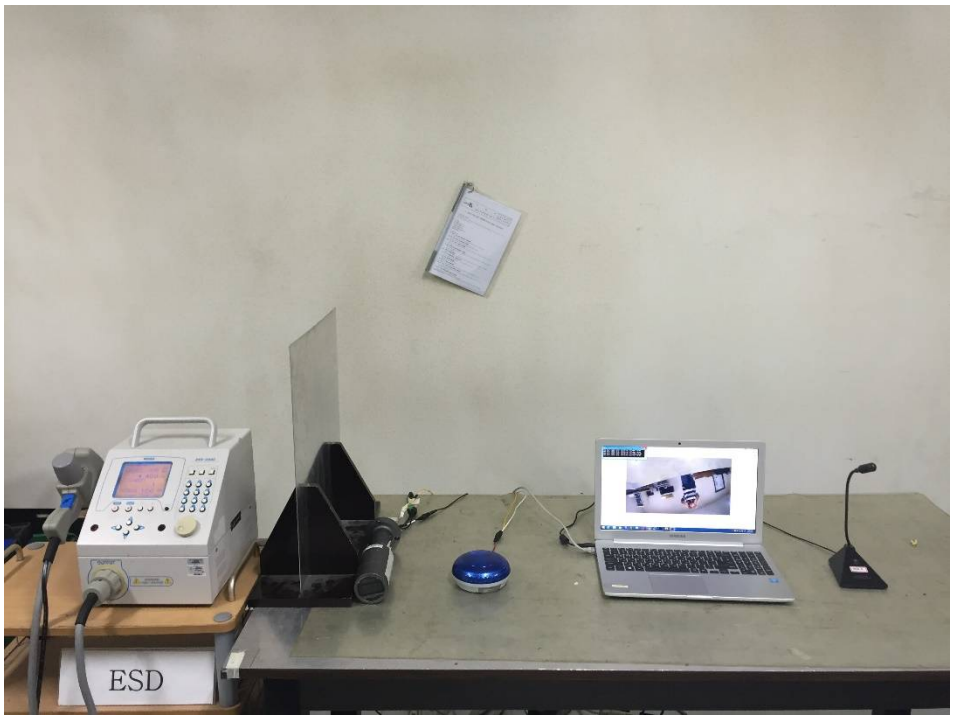


## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

## Electrostatic Discharge

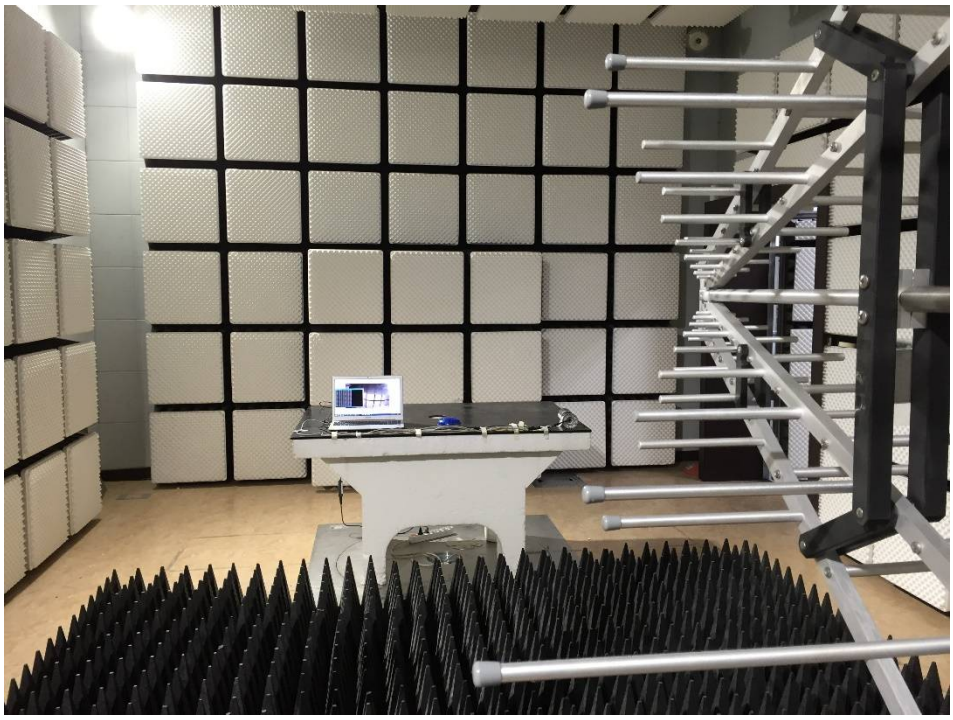
- DC 12 V Mode




- PoE Mode

## Radiated Electric Field Immunity

- DC 12 V Mode

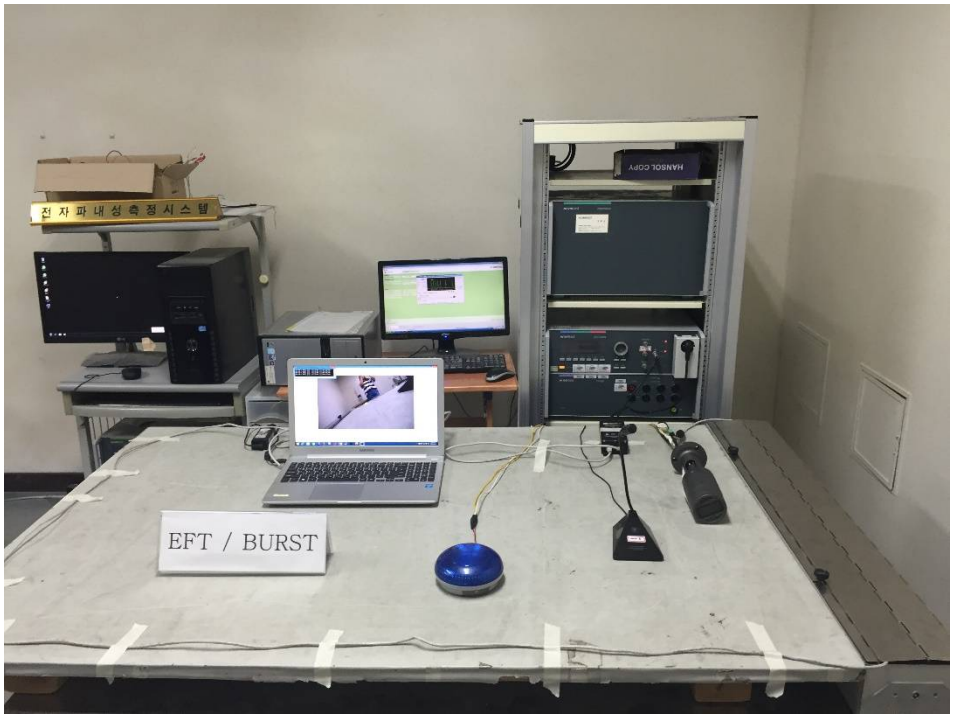


- PoE Mode

## Electrical Fast Transients/Bursts

- DC 12 V Mode

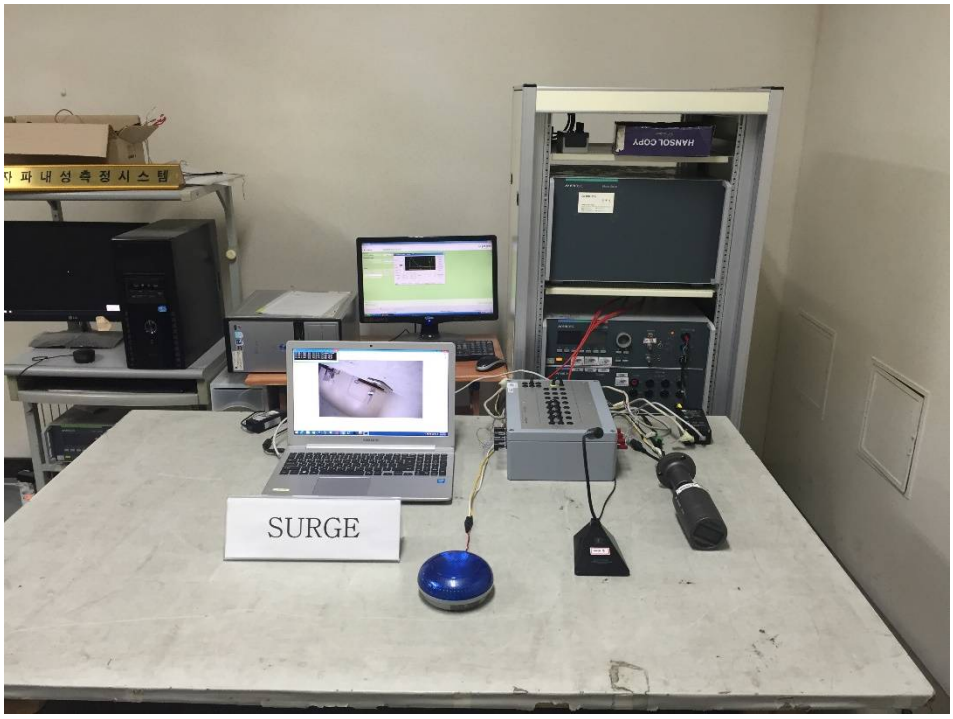

- PoE Mode



## Surge Transients

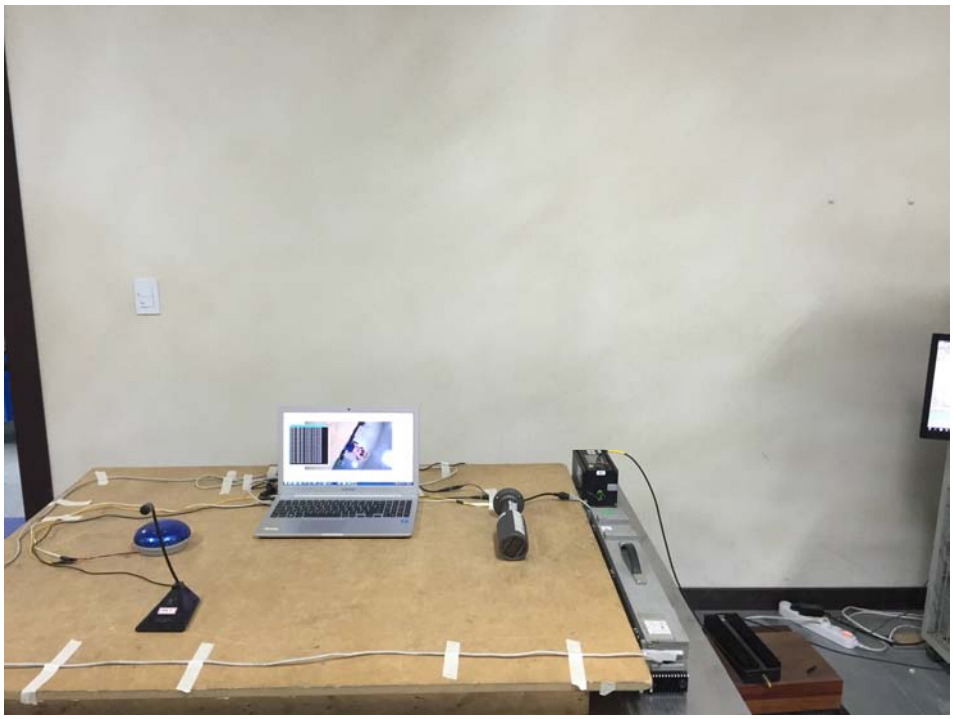
- DC 12 V Mode

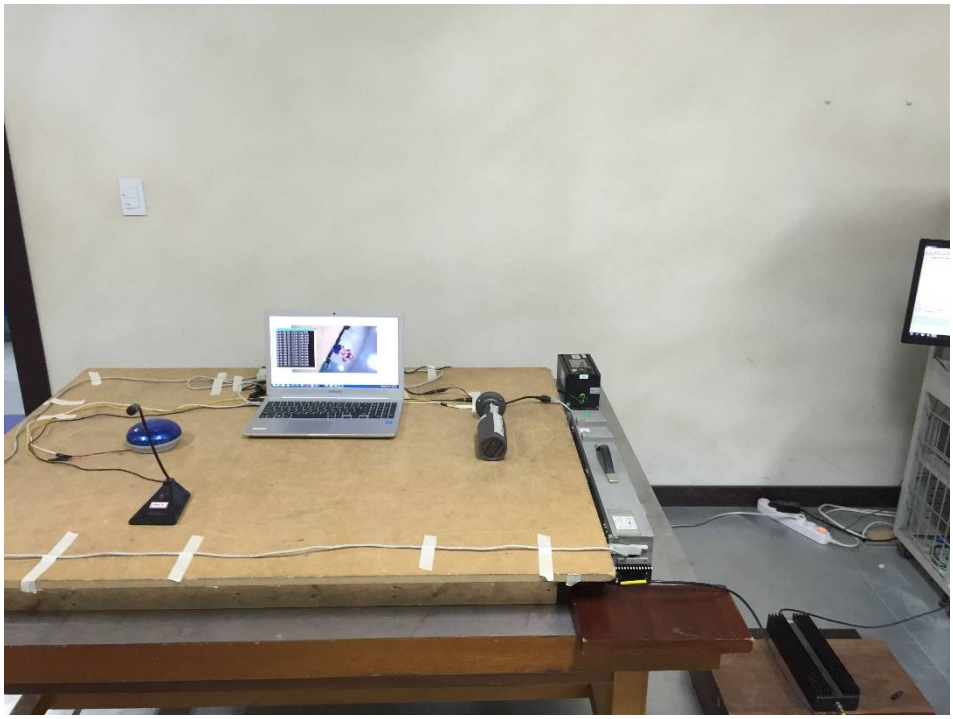

- PoE Mode



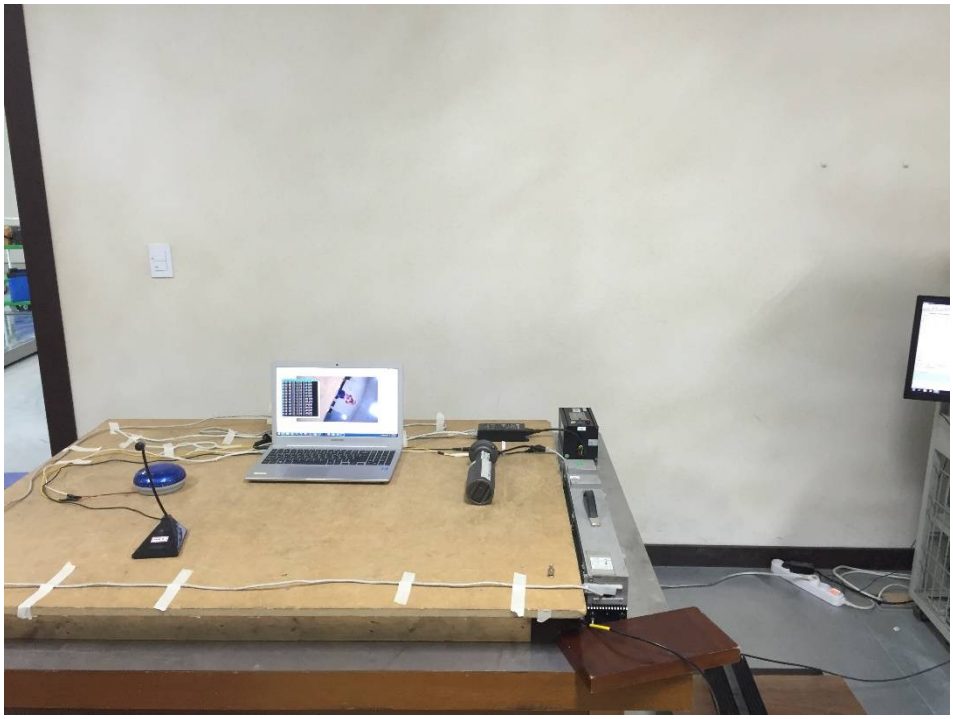
## Conducted Disturbance

- DC 12 V Mode





- PoE Mode



## Power Frequency Magnetic Field Immunity

N/A

## Voltage Dips and Short Interruptions

N/A

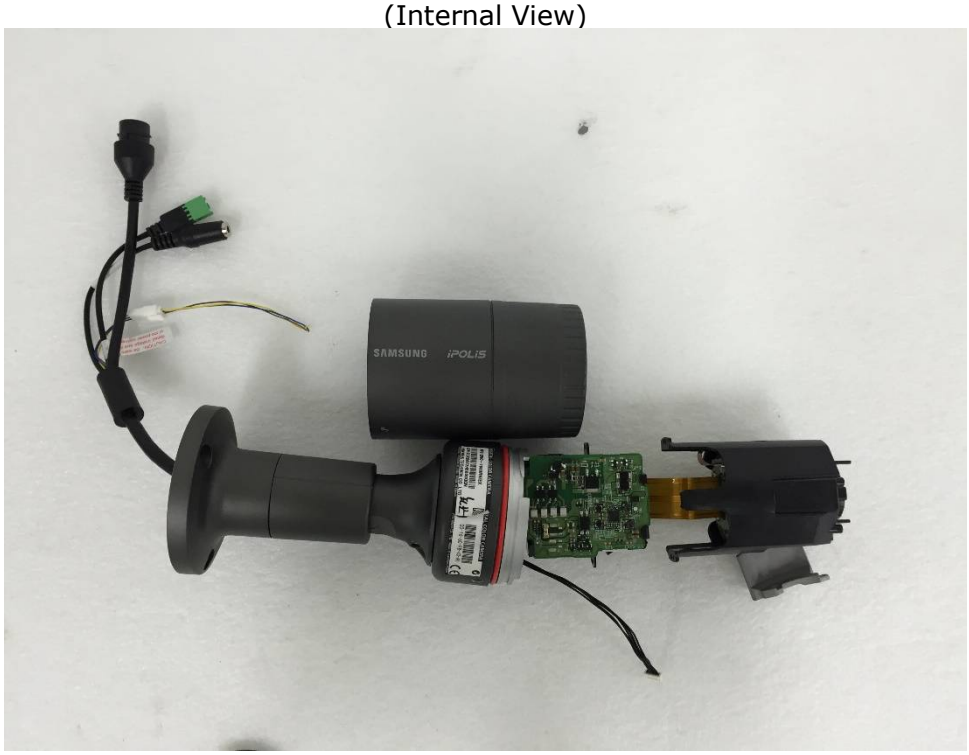
# E.U.T External Photographs

(Top)

(Bottom)

# E.U.T Internal Photographs

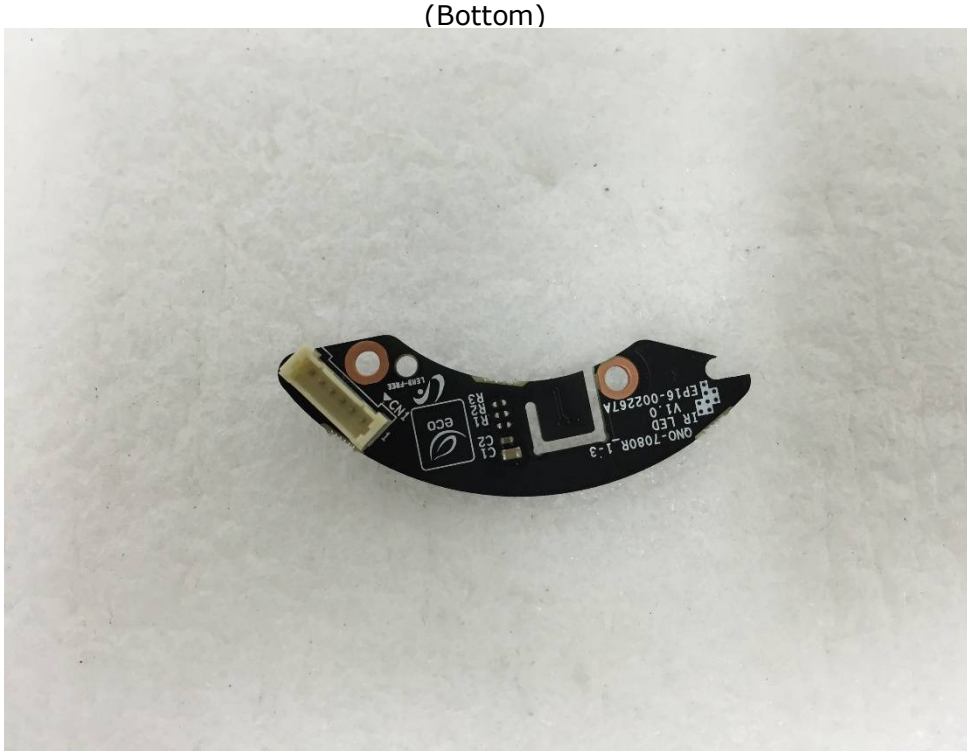
(Internal View)



# EUT Internal View – SUB BOARD1

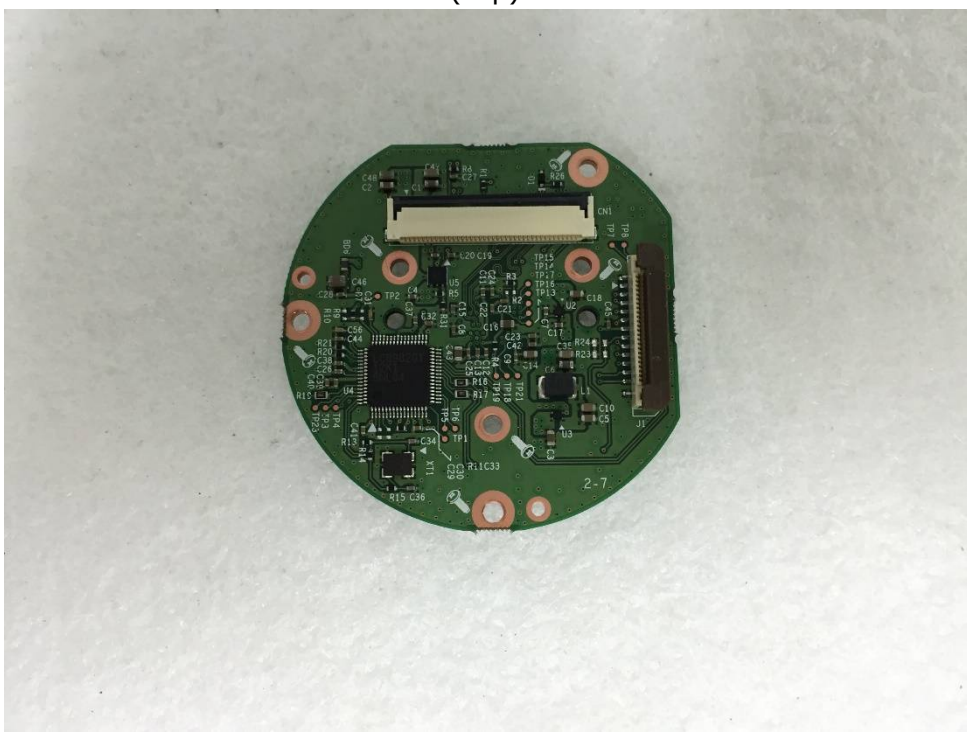
(Top)

(Bottom)

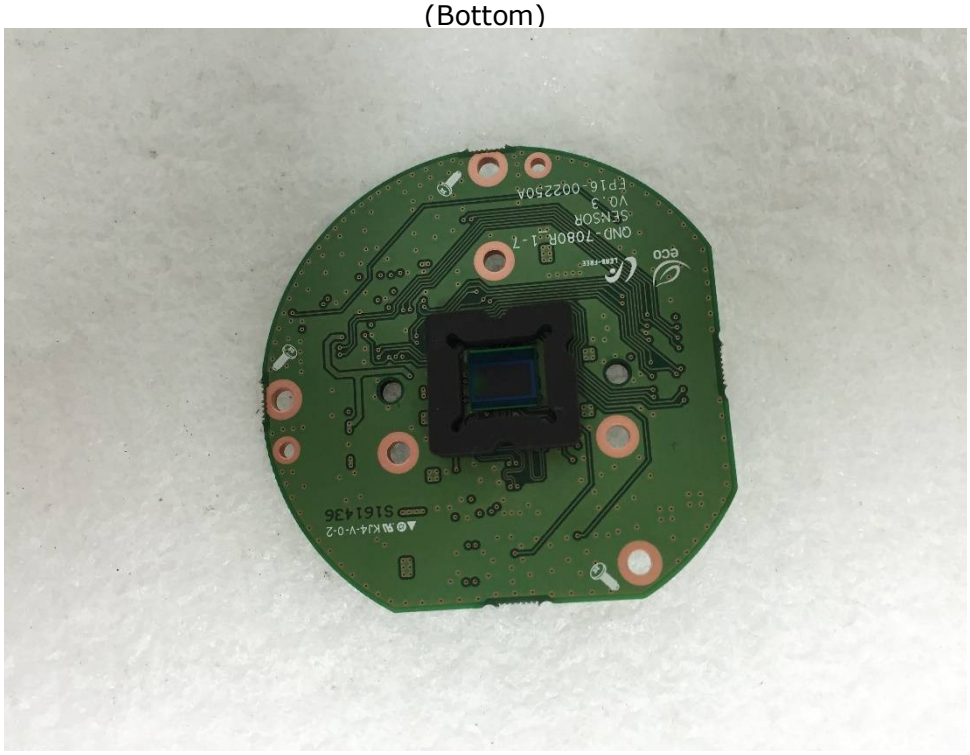


# EUT Internal View – SUB BOARD2

(Top)

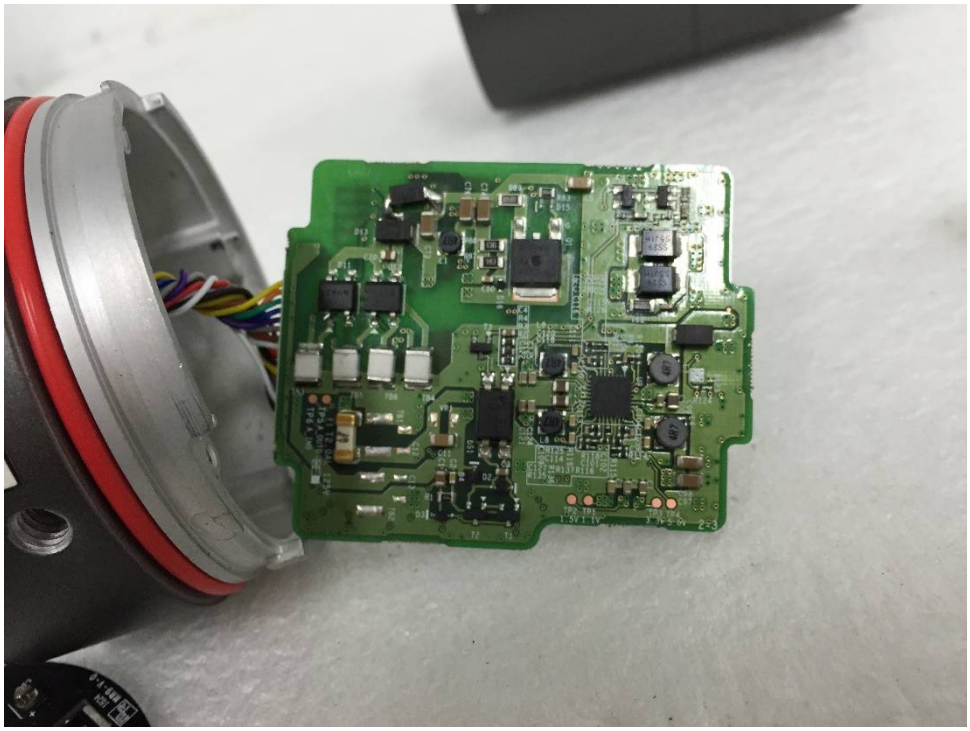


(Bottom)

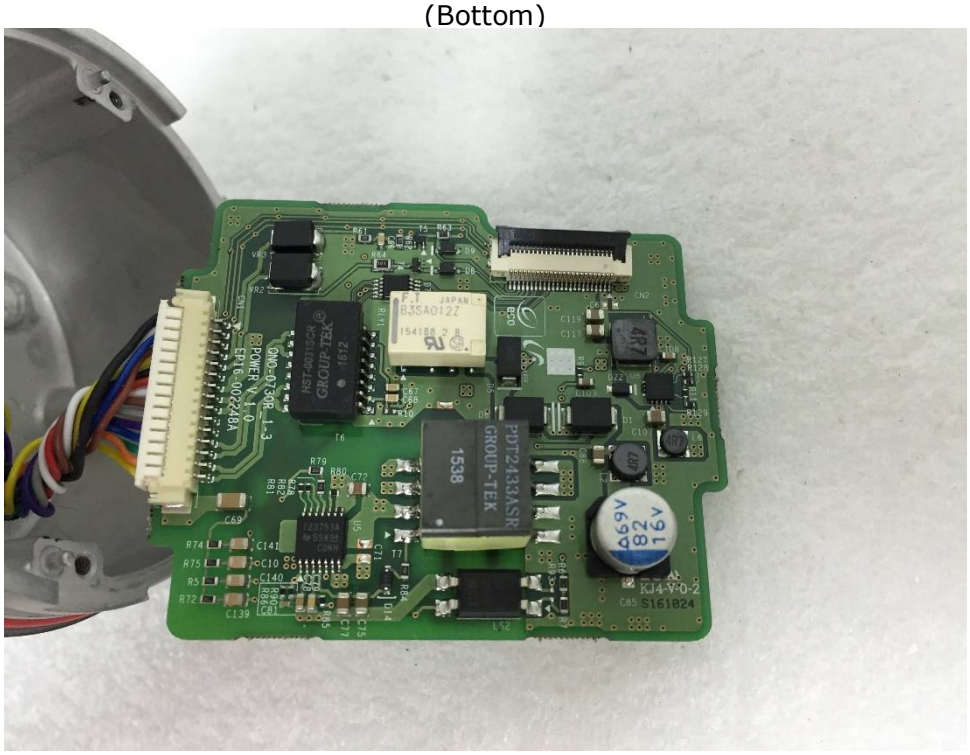


# EUT Internal View – SUB BOARD3

(Top)

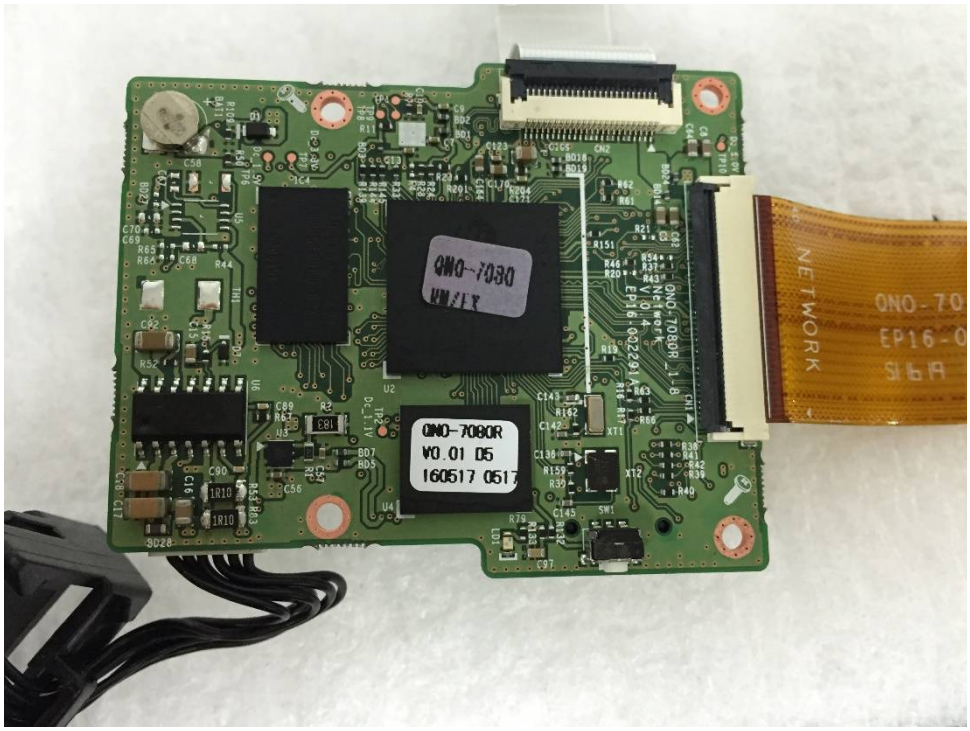


(Bottom)

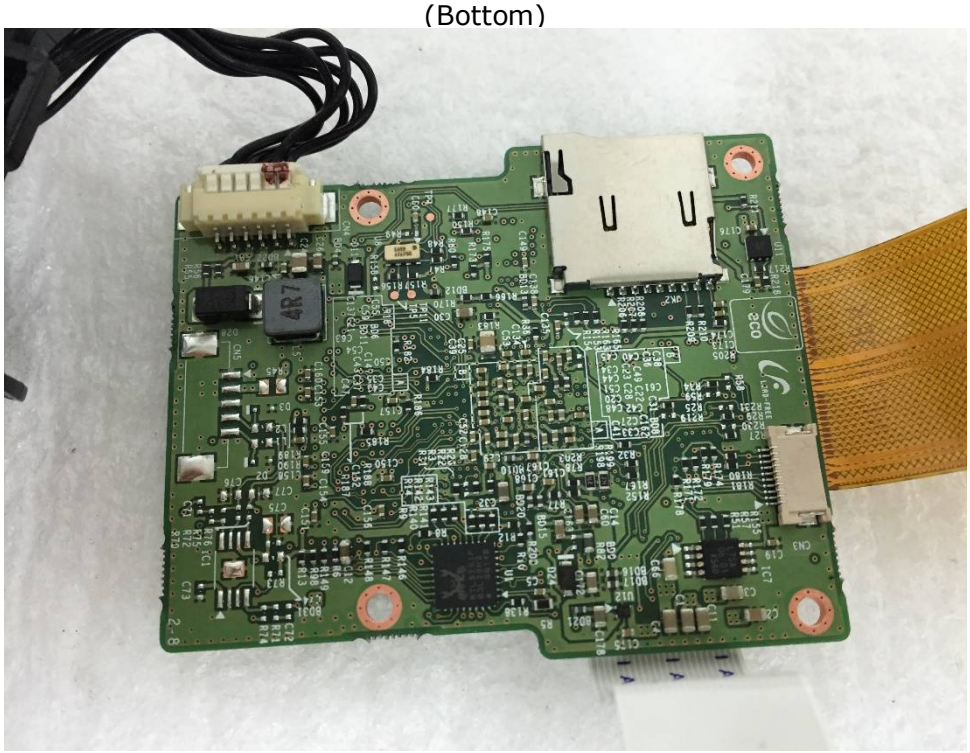


# EUT Internal View – MAIN BOARD

(Top)




(Bottom)



# Label and Location

**NETWORK CAMERA**

Model No : QNO-7080RP

Manufacturer : Tianjin Samsung Techwin Opto-Electronic Co.,Ltd.

Made in of China