



## EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0652-R1

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA

Model/Type No. : XND-8080R

Variant Model : XND-8080RP

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 : Nov. 23, 2016

Test date : Nov. 12, 2016 – Nov. 14, 2016

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Jin Bae Lee  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KOLAS.

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**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

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**REPORT REVISION HISTORY**

| Date          | Test Report No.   | Revision History                                                                                                                                 |
|---------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Dec. 19, 2016 | KES-E1-16T0652    | Issued                                                                                                                                           |
| May. 15, 2019 | KES-E1-16T0652-R1 | Changed customer's address, factory addition,<br>application standard due to customer request.<br>Delete model name 'P' and add derivative model |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |
|               |                   |                                                                                                                                                  |

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## 1.0 General Product Description

Main Specifications of E.U.T are:

| Video                       |                                                                                                                                                                                                                                                                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imaging Device              | 1/1.8" 6M CMOS                                                                                                                                                                                                                                                   |
| Total Pixels                | 3096(H) x 2094(V)                                                                                                                                                                                                                                                |
| Effective Pixels            | 2616(H) x 1976(V)                                                                                                                                                                                                                                                |
| Scanning System             | Progressive Scan                                                                                                                                                                                                                                                 |
| Min. Illumination           | Color : 0.1 lux(F1.3, 1/30sec)<br>B/W : 0 Lux (F1.3, IR LED On)                                                                                                                                                                                                  |
| S / N Ratio                 | 50dB                                                                                                                                                                                                                                                             |
| Video Out                   | CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation<br>USB : Micro USB type B, 1920 x 1080, for installation                                                                                                                               |
| Lens                        |                                                                                                                                                                                                                                                                  |
| Focal Length (Zoom Ratio)   | 3.9~9.4mm(2.4x) motorized varifocal                                                                                                                                                                                                                              |
| Max. Aperture Ratio         | F1.3                                                                                                                                                                                                                                                             |
| Angular Field of View       | TBD                                                                                                                                                                                                                                                              |
| Min. Object Distance        | 0.5m (1.64ft)                                                                                                                                                                                                                                                    |
| Focus Control               | Simple focus(Motorized V/F) / Manual, Remote control via network(Manual, Simple focus)                                                                                                                                                                           |
| Lens Type                   | DC Auto Iris, P-iris                                                                                                                                                                                                                                             |
| Mount Type                  | Board-in type                                                                                                                                                                                                                                                    |
| Pan / Tilt / Rotate         |                                                                                                                                                                                                                                                                  |
| Pan / Tilt / Rotate range   | 0° ~ 354° / 0° ~ 85°(TBD) / 0° ~ 355°                                                                                                                                                                                                                            |
| Operational                 |                                                                                                                                                                                                                                                                  |
| IR-LED                      | TBD                                                                                                                                                                                                                                                              |
| Viewable Length             | (TBD)50m(164.04ft)                                                                                                                                                                                                                                               |
| Camera Title                | Off / On (Displayed up to 85 characters)<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                 | Auto (ICR) / Color / B/W / External / Schedule                                                                                                                                                                                                                   |
| Backlight Compensation      | Off / BLC / HLC(Masking/Dimming), WDR                                                                                                                                                                                                                            |
| Wide Dynamic Range          | 120dB                                                                                                                                                                                                                                                            |
| Contrast Enhancement        | SSDR (Off / On)                                                                                                                                                                                                                                                  |
| Digital Noise Reduction     | SSNR5 (2D+3D Noise Filter) (Off / On)                                                                                                                                                                                                                            |
| Digital Image Stabilization | Off / On (Built-in Gyro sensor)                                                                                                                                                                                                                                  |
| Defog                       | Auto(input from fog detection) / Manual / Off                                                                                                                                                                                                                    |
| Motion Detection            | Off/ On(8ea, 8point Polygonal zones), Hand over                                                                                                                                                                                                                  |
| Privacy Masking             | Off / On (32ea, polygonal zones)<br>- Color : Grey/Green/Red/Blue/Black/White<br>- Mosaic                                                                                                                                                                        |
| Gain Control                | Off / Low / Medle / High / Manual                                                                                                                                                                                                                                |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium)                                                                                                                                                                                                |
| Contrast                    | level adjustment                                                                                                                                                                                                                                                 |
| LDC                         | On/Off (5 levels with Min/Max)                                                                                                                                                                                                                                   |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)                                                                                                                                                                                                               |
| Digital PTZ                 | 24X, 'Digital PTZ(Preset, Group)                                                                                                                                                                                                                                 |
| Flip / Mirror               | Flip : On/Off<br>Mirror : On/Off<br>Hallway view : 90°/270°                                                                                                                                                                                                      |
| Intelligent Video & Audio A | Tampering, Loitering, Directional Detection, Defocus Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Motion Detection, Digital Auto Tracking, Sound Classification                                                      |
| Alarm I/O                   | Input 1ea / Output 1ea                                                                                                                                                                                                                                           |

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# KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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|                          |                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote Control Interface | -                                                                                                                                                                                                                                     |
| RS-485 Protocol          | -                                                                                                                                                                                                                                     |
| Alarm Triggers           | Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect                                                                                                                                                            |
| Alarm events             | File upload via FTP, E-Mail<br>Notification via E-Mail<br>local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers<br>External output<br>DPTZ preset                                                                            |
| Audio In                 | Selectable (Mic IN/Line IN),<br>Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm                                                                                                                                          |
| Audio out                | Line out, Max output level: 1 Vrms                                                                                                                                                                                                    |
| Fan / Heater             | TBD                                                                                                                                                                                                                                   |
| Pixel Counter            | Support                                                                                                                                                                                                                               |
| <b>Network</b>           |                                                                                                                                                                                                                                       |
| Ethernet                 | RJ-45 (10/100BASE-T)                                                                                                                                                                                                                  |
| Video Compression Format | H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG                                                                                                                                                                   |
| Resolution               | 2560 x 1920, 2560 x 1440, 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 960<br>1280 x 720, 1024 x 768, 800 x 600, 720 x 576, 720 x 480, 640 x 480, 320 x 240                                                                          |
| Max. Framerate           | H.265/H.264 : Max. 30fps at all resolutions<br>Motion JPEG : Max. 30fps                                                                                                                                                               |
| Smart Codec              | Manual Mode (area-based : 5EA)                                                                                                                                                                                                        |
| WiseStream               | Support                                                                                                                                                                                                                               |
| Video Quality Adjustment | H.264/H.265 : Target Bitrate Level Control<br>MJPEG : Target Bitrate Level Control                                                                                                                                                    |
| Bitrate Control Method   | H.264/H.265 : CBR or VBR, with WiseStream<br>MJPEG : VBR                                                                                                                                                                              |
| Streaming Capability     | Multiple Streaming (Up to 10 Profiles)                                                                                                                                                                                                |
| 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<br>AAC-LC : 48Kbps at 8/16/32/48KHz                                                                                         |
| Audio Communication      | Bi-directional (2-Way)                                                                                                                                                                                                                |
| IP                       | IPv4, IPv6                                                                                                                                                                                                                            |
| Protocol                 | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, 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 (EAP-TLS, EAP-LEAP)                                                                                |
| Streaming Method         | Unicast / Multicast                                                                                                                                                                                                                   |
| Max. User Access         | 20 users at Unicast Mode                                                                                                                                                                                                              |
| Edge Storage             | SD/SDHC/SDXC 2slot (up to 512 GB)<br>- Continuous recording(1'st slot to 2'nd slot)<br>- Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.<br>NAS(Network Attached Storage)<br>Local PC for Instant Recording |

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|                                  |                                                                                                                                                                                                                                                                                                     |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application Programming          | ONVIF Profile S/G<br>SUNAPI(HTTP API)<br>Open Platform                                                                                                                                                                                                                                              |
| Webpage Language                 | English, Korean, Chinese, French, Italian, Spanish, German, Japanese,<br>Russian, Swedish, Danish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatia,<br>Hungary, Greek, Norsk, Finnish                                                                                         |
| Web Viewer                       | Supported OS: Windows 7, 8, 10, Mac OS X 10.10. 10.11 10.12<br><b>Non-plugin Webviewer</b><br>Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49 , Apple Safari 9 (Mac OS X only)<br><b>Plug-in Webviewer</b><br>Supported Browser : MS Explore 11, Apple Safari 9 (Mac OS X only) |
| Central Management Soft          | SmartViewer, SSM                                                                                                                                                                                                                                                                                    |
| <b>Environmental</b>             |                                                                                                                                                                                                                                                                                                     |
| Operating Temperature / Humidity | -10°C ~ +55°C (-14°F ~ +131°F) / Less than 90% RH                                                                                                                                                                                                                                                   |
| Storage Temperature / Humidity   | -50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                   |
| Ingress Protection               | IP67, IP66, NEMA 4X                                                                                                                                                                                                                                                                                 |
| Vandal Resistance                | IK10                                                                                                                                                                                                                                                                                                |
| <b>Electrical</b>                |                                                                                                                                                                                                                                                                                                     |
| Input Voltage / Current          | 12VDC ± 10%, PoE(IEEE802.3af)                                                                                                                                                                                                                                                                       |
| Power Consumption                | TBD                                                                                                                                                                                                                                                                                                 |
| <b>Mechanical</b>                |                                                                                                                                                                                                                                                                                                     |
| Color / Material                 | Ivory / Aluminum                                                                                                                                                                                                                                                                                    |
| Dimension (WxHxD)                | TBD                                                                                                                                                                                                                                                                                                 |
| Weight                           | TBD                                                                                                                                                                                                                                                                                                 |

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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 ☐ 24 Vac ☒ 12 Vdc ☒ PoE  
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Add derivative model for vendor management

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                      | Remarks |
|----------------|--------------|---------------|-----------------------------------|---------|
| NETWORK CAMERA | XND-8080R    | -             | Hanwha Techwin (Tianjin) Co.,Ltd. | E.U.T   |

## 1.5 Support Equipments

| Description      | Model Number  | Serial Number      | Manufacturer                      | Remarks |
|------------------|---------------|--------------------|-----------------------------------|---------|
| POE Adapter      | PD-3001GC/AC  | RD9356082016964200 | Power Dsine                       | -       |
| Notebook         | X56K          | HN11N5151FJ0045W   | HANSUNG                           | -       |
| Notebook Adapter | A12-120P1A    | F180271552011758   | CHICONY POWER TECHNOLOGY CO.,LTD. | -       |
| Phone            | A1530         | -                  | APPLE                             | -       |
| MIC              | CMK-303       | -                  | CAMAC                             | 1.7 m   |
| Speaker          | BR10000A CUVE | -                  | BEIJING EDIFIER HI-TECH GROUP.    | 1.6 m   |
| Alarm            | -             | -                  | -                                 | -       |

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## 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      |
|                        | 3.5 mm   | MIC         | 3.5 mm    | 1.7         | U      |
|                        | 3.5 mm   | Speaker     | 3.5 mm    | 1.6         | U      |
|                        | 3 pin    | Alarm       | 3 pin     | 3.0         | U      |
| Notebook               | Audio in | Phone       | Audio out | 1.7         | 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)  | POE Adapter | RJ-45 (POE)  | 3.0         | U      |
|                        | 3.5 mm       | MIC         | 3.5 mm       | 1.7         | U      |
|                        | 3.5 mm       | Speaker     | 3.5 mm       | 1.6         | U      |
|                        | 3 pin        | Alarm       | 3 pin        | 3.0         | U      |
| Notebook               | Audio in     | Phone       | Audio out    | 1.7         | U      |
|                        | RJ-45 (DATA) | POE Adapter | RJ-45 (DATA) | 3.0         | U      |

\* Unshielded=U, Shielded=S

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

|                                     |
|-------------------------------------|
| operating                           |
| E.U.T Monitoring , Ping test, 1 kHz |

| E.U.T Test operating S / W |         |                          |
|----------------------------|---------|--------------------------|
| Name                       | Version | Manufacture Company      |
| SmartViewer                | -       | Hanwha Techwin Co., Ltd. |

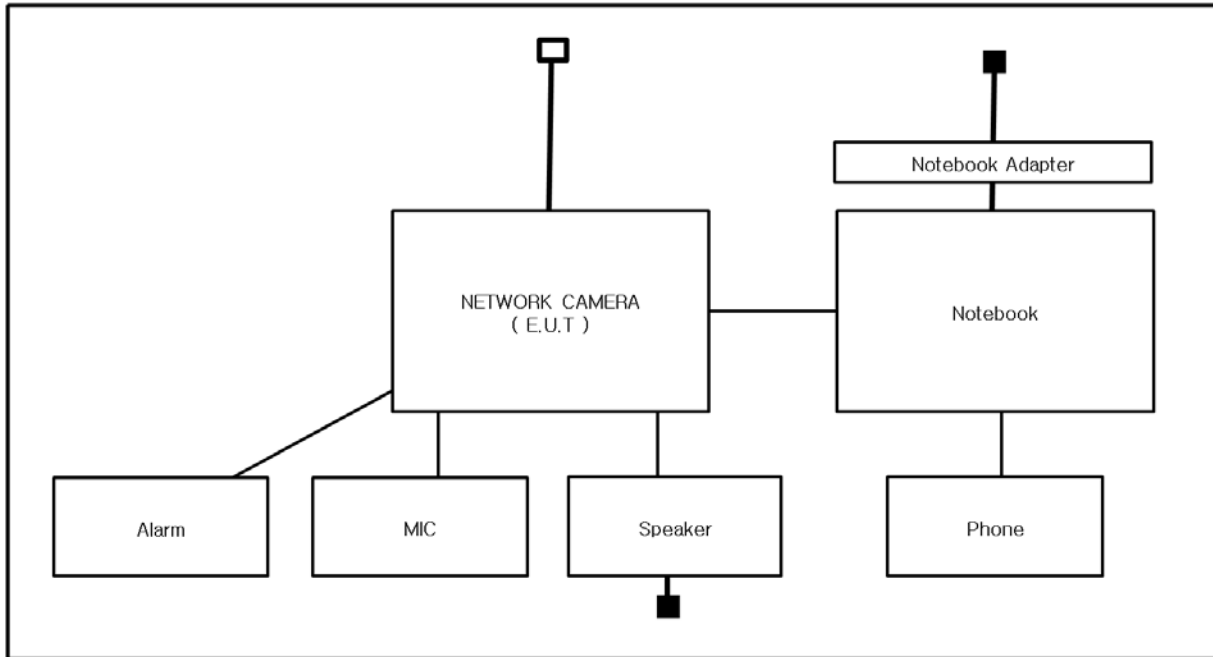
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## 1.8 Configuration

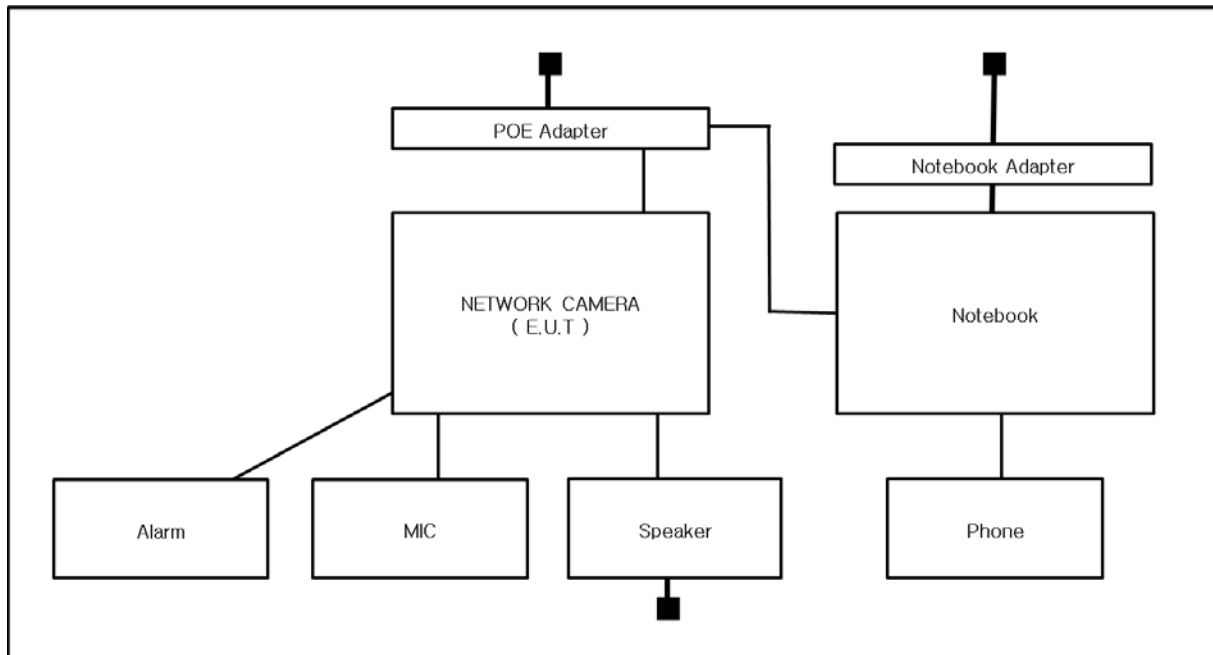
■ AC Main

☐ DC 12 V Main

- DC 12 V Mode



- PoE Mode



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## 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 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

## 1.11 Laboratory Accreditations and Listings

| Country       | Agency  | Scope of Accreditation                                                                                                                                                                         | Logo                                                                                                                      |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| KOREA         | RRA     | EMI (3 m & 10 m Semi-Anechoic Chamber ,<br>10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                 | <br>KR0100                             |
| International | KOLAS   | EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                                   | <br>KT489                             |
| USA           | FCC     | 3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.                                                                               | <br>KR0100                           |
| Canada        | ISED    | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                                                                       | <br>23298-1                          |
| 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 | <br>R-4308, C-4798,<br>T-2311, G-914 |
| Europe        | TÜV SÜD | EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                    | <br>CARAT 17 07 01633<br>001         |



## 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



**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

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- |                                                        |                                  |                                  |
|--------------------------------------------------------|----------------------------------|----------------------------------|
| <input type="checkbox"/> VCCI V-3 / 2015.04            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> AS/NZS CISPR22:2009 +A1:2010  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> 47 CFR Part 15, Subpart 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"/> IC Regulation ICES-003 : 2016 |                                  |                                  |
| <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               |                                  |                                  |
| <input type="checkbox"/> RE- Directive 2014/53/EU      |                                  |                                  |
| <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                 |                                  |                                  |

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## 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      | -             | -            |
| <input type="checkbox"/> | EMI Test S/W            | EMC32        | R&S          | 9.12.00       | -            |

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

N/A 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  
Dec, 12, 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, 11, 2017 |
| <input checked="" type="checkbox"/> | Electro wave Shieldroom | -            | SEMITEC          | -             | -            |
| <input checked="" type="checkbox"/> | EMI Test S/W            | EMC32        | R&S              | 9.12.00       | -            |

### Test Conditions

Temperature: 18,5 °C  
Relative Humidity: 39,6 %

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

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

Test Date

Dec, 12, 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 ANT | 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    | -             | -            |
| <input checked="" type="checkbox"/> | EMI Test S/W         | -            | -            | -             | -            |

Test Conditions

Temperature: 2,8 °C

Relative Humidity: 63,0 %

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.

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

Test Date

Dec, 12, 2016

Test Location

Semi Anechoic Chamber #2

Test Equipment

| Used                                | Description                    | Model Number | Manufacturer                  | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------------|--------------|-------------------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA     | SAS-571      | A.H.SYSTEM,INC                | 781           | 05, 07, 2017 |
| <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, 14, 2017 |
| <input checked="" type="checkbox"/> | Semi Anechoic Chamber #2       | -            | SEMITEC                       | -             | -            |
| <input checked="" type="checkbox"/> | Antenna Mast                   | -            | AUDIX                         | -             | -            |
| <input checked="" type="checkbox"/> | Turn Table                     | -            | AUDIX                         | -             | -            |
| <input checked="" type="checkbox"/> | EMI Test S/W                   | e3           | AUDIX                         | 8.083b        | -            |

Test Conditions

Temperature: 18,5 °C

Relative Humidity: 39,6 %

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, 08, 2017 |
| <input type="checkbox"/> | Digital Power Analyzer | DPA 500 N    | EM TEST      | V1024106759   | 08, 08, 2017 |
| <input type="checkbox"/> | EMI Test S/W           | dpa.control  | EM TEST AG   | 5.4.8.0       | -            |

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

N/A 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, 08, 2017 |
| <input type="checkbox"/> | Digital Power Analyzer | DPA 500 N    | EM test      | V1024106759   | 08, 08, 2017 |
| <input type="checkbox"/> | EMI Test S/W           | dpa.control  | EM TEST AG   | 5.4.8.0       | -            |

Test Conditions

Temperature:

°C

Relative Humidity:

%

Test Results

The requirements are:

☐ PASS

☐ NOT PASS

☒ NOT APPLICABLE

Remarks

N/A Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.

### 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

Dec, 13, 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    | -             | -            |
| <input checked="" type="checkbox"/> | EMS Test S/W  | N/A          | N/A          | N/A           | -            |

#### Test Conditions

Temperature: 17,1 °C  
Relative Humidity: 36,2 %  
Atmospheric Pressure: 100,1 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: | Contact                                  | Air                                      | HCP                                      | VCP                                      |
|                    | <input type="checkbox"/> 2 kV            | <input checked="" type="checkbox"/> 2 kV | <input type="checkbox"/> 2 kV            | <input type="checkbox"/> 2 kV            |
|                    | <input type="checkbox"/> 4 kV            | <input checked="" type="checkbox"/> 4 kV | <input type="checkbox"/> 4 kV            | <input type="checkbox"/> 4 kV            |
|                    | <input checked="" type="checkbox"/> 6 kV | <input type="checkbox"/> 6 kV            | <input checked="" type="checkbox"/> 6 kV | <input checked="" type="checkbox"/> 6 kV |
|                    | <input type="checkbox"/> 8 kV            | <input checked="" type="checkbox"/> 8 kV | <input type="checkbox"/> 8 kV            | <input type="checkbox"/> 8 kV            |
|                    | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           |

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

Required Performance Criteria: ☒ Complied

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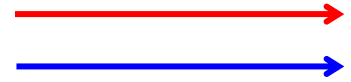
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3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Location of Discharge:

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



N/A

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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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**Test Data****- DC 12 V Mode****Indirect Discharge**

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

**Direct Discharge**

| No. | Test Point | Discharge Method | Observations | Remarks |
|-----|------------|------------------|--------------|---------|
| -   | -          | -                | -            | -       |

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

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

**Direct Discharge**

| No. | Test Point | Discharge Method | Observations | Remarks |
|-----|------------|------------------|--------------|---------|
| -   | -          | -                | -            | -       |

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.

\* NO direct discharge site, so Indirece Discharge 200 Circait Replacememt.



## 3.2 Radiated Electric Field Immunity

### Reference Standard

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

### Test Date

Dec, 13, 2016

### Test Location

EMS-RS: ☐ Semi Anechoic Chamber #1

☒ Semi Anechoic Chamber #2

### Test Equipment

| Used                                | Description                    | Model Number        | Manufacturer                        | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------------|---------------------|-------------------------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | Signal Generator               | ESG-3000A           | HP                                  | US37040210    | 11, 01, 2017 |
| <input checked="" type="checkbox"/> | Amplifier                      | ITA0300-200         | Infinitech                          | -             | 11, 01, 2017 |
| <input checked="" type="checkbox"/> | Amplifier                      | ITA0750-200         | Infinitech                          | -             | 11, 01, 2017 |
| <input checked="" type="checkbox"/> | Amplifier                      | ITA1500-100         | Infinitech                          | -             | 11, 01, 2017 |
| <input checked="" type="checkbox"/> | Amplifier                      | ITA2500-100         | Infinitech                          | -             | 11, 01, 2017 |
| <input checked="" type="checkbox"/> | GPIO INTERFACE CONTROL         | SYSTEM CONTROL UNIT | Infinitech                          | -             | -            |
| <input checked="" type="checkbox"/> | POWER SUPPLY                   | SYSTEM POWER SUPPLY | Infinitech                          | -             | -            |
| <input checked="" type="checkbox"/> | Power Meter                    | E4419B              | Agilent                             | MY45101506    | 06, 27, 2017 |
| <input checked="" type="checkbox"/> | Average Power Sensor           | E9301A              | Agilent                             | -             | -            |
| <input checked="" type="checkbox"/> | Average Power Sensor           | E9301A              | Agilent                             | MY41495698    | 11,17,2017   |
| <input checked="" type="checkbox"/> | Stacked Double Log-Per-Antenna | STPL9128 D          | SCHWARZBECK                         | 9128D038      | -            |
| <input checked="" type="checkbox"/> | Semi Anechoic Chamber #2       | -                   | SEMITEC                             | -             | -            |
| <input checked="" type="checkbox"/> | EMS Test S/W                   | KTI_RS2012          | KOREA TECHNOLOGY INSTITUTE CO., LTD | 2.1.1         |              |



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3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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### Test Conditions

Temperature: 17,1 °C  
Relative Humidity: 36,2 %  
Atmospheric Pressure: 100,1 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

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3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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**Test Data****- DC 12 V Mode**

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

**- PoE Mode**

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.

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### 3.3 Electrical Fast Transients / Bursts

#### Reference Standard

EN 61000-4-4:2012

#### Test Date

Dec, 14, 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 |
| <input checked="" type="checkbox"/> | EMS Test S/W              | iec.control  | EM TEST AG   | 5.0.9.0       | -            |

#### Test Conditions

Temperature: 17,6 °C  
Relative Humidity: 36.9 %  
Atmospheric Pressure: 100,8 kPa

#### Test Specifications

Pulse Amplitude & Polarity:  
(DC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV  
☐ ± 4.0 kV

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

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 (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) |
| 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) |
| 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.

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### 3.4 Surge Transients

#### Reference Standard

EN 61000-4-5:2014

#### Test Date

Dec, 14, 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   | 06, 27, 2017 |
| <input type="checkbox"/>            | CDN                     | CNV 508T5    | EM TEST      | P1549168422   | 04, 27, 2017 |
| <input checked="" type="checkbox"/> | CDN                     | CNV 508N1    | EM TEST      | P1551168979   | 04, 27, 2017 |
| <input checked="" type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST AG   | 5.0.9.0       | -            |

#### Test Conditions

Temperature: 17,6 °C  
Relative Humidity: 36,9 %  
Atmospheric Pressure: 100,8 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

☐ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| L1-PE               | Complied       | Complied       |
| L2-PE               | Complied       | Complied       |

### Signal Lines

☒ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

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3701, 40, Simin-daero 365beon-gil,  
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**- POE Mode**☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| L1-PE               | -              | -              |
| L2-PE               | -              | -              |

**Signal Lines**☒ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| RJ-45 (PoE)         | Complied       | Complied       |
| Alarm (3 Pin)       | 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

Dec, 14, 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   | 08, 08, 2017 |
| <input checked="" type="checkbox"/> | 6 dB Attenuator           | ATT6         | EM TEST      | 1208-34       | 08, 08, 2017 |
| <input checked="" type="checkbox"/> | CDN                       | CDN-M2/M3N   | EM TEST      | 0909-06       | 08, 08, 2017 |
| <input type="checkbox"/>            | CDN                       | CDN-T2-RJ11  | EM TEST      | 0909-07       | 08, 08, 2017 |
| <input type="checkbox"/>            | CDN                       | CDN-T4       | EM TEST      | 0909-08       | 08, 08, 2017 |
| <input type="checkbox"/>            | CDN                       | CDN-T8RJ45   | EM TEST      | 0909-09       | 08, 08, 2017 |
| <input type="checkbox"/>            | CDN                       | CDN-AF2      | EM TEST      | 0909-10       | 08, 08, 2017 |
| <input type="checkbox"/>            | CDN                       | CDN-AF4      | EM TEST      | 0909-11       | 08, 08, 2017 |
| <input checked="" type="checkbox"/> | EM Injection Clamp        | EM 101       | Liithi       | 35943         | 02, 04, 2017 |
| <input checked="" type="checkbox"/> | EMS Test S/W              | icd.control  | EM TEST AG   | 5.3.7         | -            |

#### Test Conditions

Temperature: 17,6 °C  
Relative Humidity: 36,9 %  
Atmospheric Pressure: 100,8 kPa



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### Test Specifications

Frequency range:

☒ 150 kHz to 100 MHz

☐ 150 kHz to 80 MHz

Voltage Level:

☐ 1 Vrms

☐ 3 Vrms

☒ 10 Vrms

Modulation:

☒ AM, 80 %, 1 kHz sine wave

☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step:

☒ 1 % step

Dwell Time:

☐ 1 s

☒ 3 s

Required Performance Criteria: ☒ Complied

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## Test Data

### - DC 12 V Mode

☐ Input a.c. power ports

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

☒ Input d.c. power ports

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

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

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method | Observations |
|--------------------------------------|-----------------|--------------|
| RJ-45 (PoE)                          | Complied        | Complied     |
| Alarm                                | Complied        | 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 |
| <input type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST AG   | 5.0.9.0       | -            |

#### Test Conditions

Temperature: °C

Relative Humidity: %

Atmospheric Pressure: kPa



## Test Specifications & Observations/Remarks

(Test Voltage : 50 Hz)

| <u>Test Level</u>                  | <u>Duration [in period/ms (50 Hz)]</u> | <u>Results</u>  |
|------------------------------------|----------------------------------------|-----------------|
| <input type="checkbox"/> 20 % dip  | <input type="checkbox"/> 250 /5000     | <u>Complied</u> |
| <input type="checkbox"/> 30 % dip  | <input type="checkbox"/> 25 /500       | <u>Complied</u> |
| <input type="checkbox"/> 60 % dip  | <input type="checkbox"/> 10 /200       | <u>Complied</u> |
| <input type="checkbox"/> 100 % dip | <input type="checkbox"/> 250 /5000     | <u>Complied</u> |

- Voltage variations

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

Observations:

Complied – No degradation of function

Test Results

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

Remarks

N/A Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.



## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

[HOT]

N/A

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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[NEUTRAL]

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

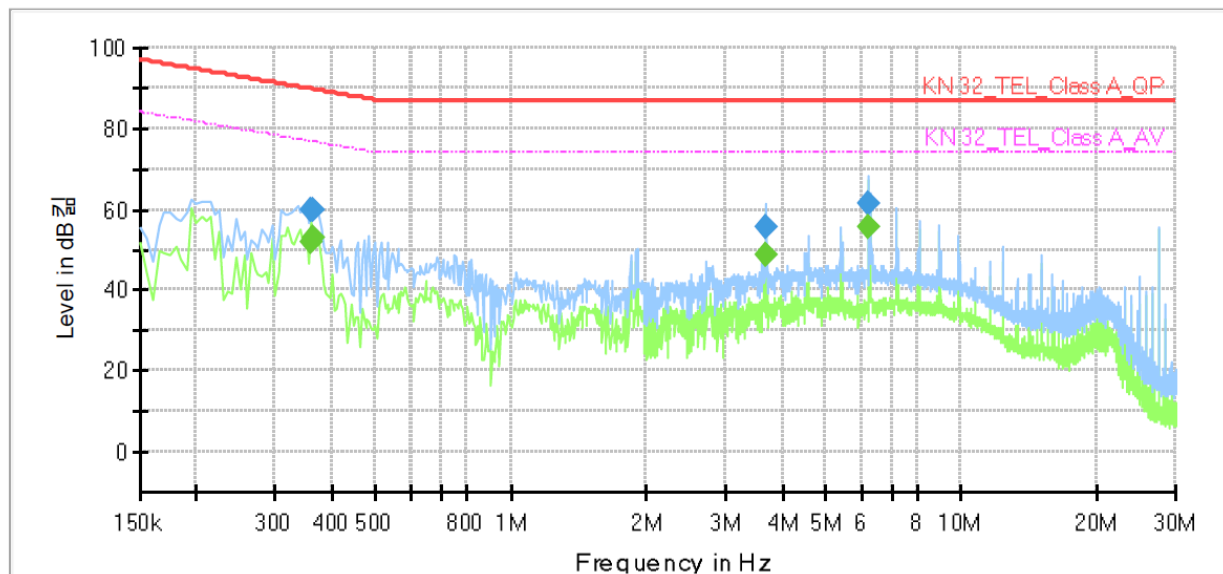
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## Conducted Emissions at Telecommunication Ports

- DC 12 V Mode  
[10 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XND-8080RP                 |
| 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.360000        | ---              | 51.95           | 76.73        | 24.78       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.360000        | 59.72            | ---             | 89.73        | 30.01       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.365000        | ---              | 52.83           | 76.61        | 23.78       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.365000        | 59.72            | ---             | 89.61        | 29.89       | 1000.0          | 9.000           | Single Line | 10.1       |
| 3.695000        | ---              | 48.79           | 74.00        | 25.21       | 1000.0          | 9.000           | Single Line | 10.2       |
| 3.695000        | 55.59            | ---             | 87.00        | 31.41       | 1000.0          | 9.000           | Single Line | 10.2       |
| 6.250000        | ---              | 55.45           | 74.00        | 18.55       | 1000.0          | 9.000           | Single Line | 10.1       |
| 6.250000        | 61.24            | ---             | 87.00        | 25.76       | 1000.0          | 9.000           | Single Line | 10.1       |

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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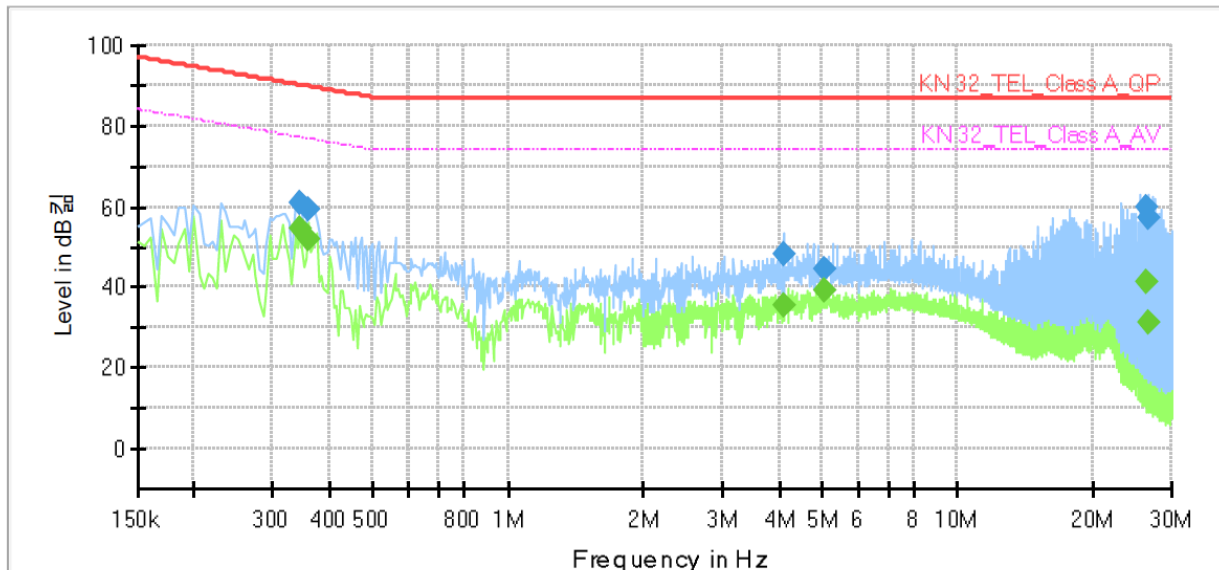
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[100 Mbps]

## Common Information

Test Description: Telecommunication Emission  
Model No.: XND-8080RP  
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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.345000        | ---              | 54.62           | 77.08        | 22.46       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.345000        | 60.88            | ---             | 90.08        | 29.20       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.360000        | ---              | 51.62           | 76.73        | 25.11       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.360000        | 59.48            | ---             | 89.73        | 30.25       | 1000.0          | 9.000           | Single Line | 9.6        |
| 4.090000        | ---              | 35.60           | 74.00        | 38.40       | 1000.0          | 9.000           | Single Line | 9.6        |
| 4.090000        | 48.05            | ---             | 87.00        | 38.95       | 1000.0          | 9.000           | Single Line | 9.6        |
| 5.040000        | ---              | 39.36           | 74.00        | 34.64       | 1000.0          | 9.000           | Single Line | 9.6        |
| 5.040000        | 44.31            | ---             | 87.00        | 42.69       | 1000.0          | 9.000           | Single Line | 9.6        |
| 26.380000       | ---              | 41.06           | 74.00        | 32.94       | 1000.0          | 9.000           | Single Line | 9.5        |
| 26.380000       | 59.80            | ---             | 87.00        | 27.20       | 1000.0          | 9.000           | Single Line | 9.5        |
| 26.610000       | ---              | 31.23           | 74.00        | 42.77       | 1000.0          | 9.000           | Single Line | 9.5        |
| 26.610000       | 57.06            | ---             | 87.00        | 29.94       | 1000.0          | 9.000           | Single Line | 9.5        |

### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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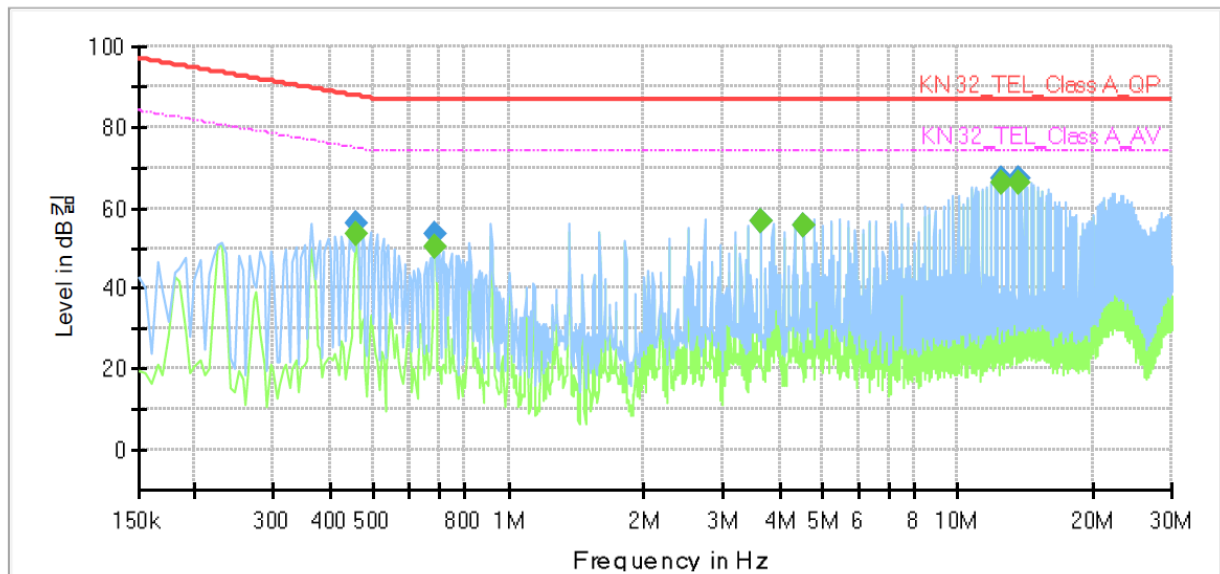
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- PoE Mode

[10 Mbps]

## Common Information

Test Description: Telecommunication Emission  
Model No.: XND-8080RP  
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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.455000        | ---              | 53.36           | 74.78        | 21.42       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.455000        | 56.33            | ---             | 87.78        | 31.45       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.685000        | ---              | 50.48           | 74.00        | 23.52       | 1000.0          | 9.000           | Single Line | 10.1       |
| 0.685000        | 53.31            | ---             | 87.00        | 33.69       | 1000.0          | 9.000           | Single Line | 10.1       |
| 3.640000        | ---              | 56.43           | 74.00        | 17.57       | 1000.0          | 9.000           | Single Line | 10.2       |
| 3.640000        | 56.58            | ---             | 87.00        | 30.42       | 1000.0          | 9.000           | Single Line | 10.2       |
| 4.550000        | ---              | 55.47           | 74.00        | 18.53       | 1000.0          | 9.000           | Single Line | 10.1       |
| 4.550000        | 55.64            | ---             | 87.00        | 31.36       | 1000.0          | 9.000           | Single Line | 10.1       |
| 12.515000       | ---              | 66.21           | 74.00        | 7.79        | 1000.0          | 9.000           | Single Line | 10.0       |
| 12.515000       | 67.35            | ---             | 87.00        | 19.65       | 1000.0          | 9.000           | Single Line | 10.0       |
| 13.655000       | ---              | 66.31           | 74.00        | 7.69        | 1000.0          | 9.000           | Single Line | 10.1       |
| 13.655000       | 67.29            | ---             | 87.00        | 19.71       | 1000.0          | 9.000           | Single Line | 10.1       |

### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

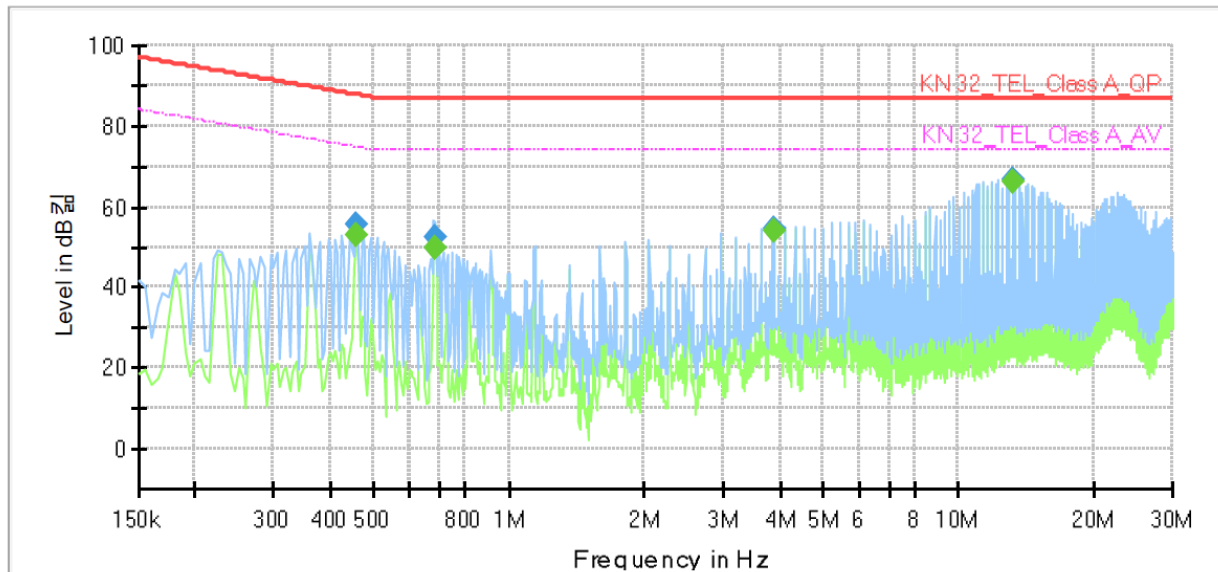
Corr. : Correction values (ISN FACTOR+ Cable Loss)

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[100 Mbps]

## Common Information

Test Description: Telecommunication Emission  
Model No.: XND-8080RP  
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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.455000        | ---              | 52.85           | 74.78        | 21.93       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.455000        | 55.69            | ---             | 87.78        | 32.09       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.685000        | ---              | 49.53           | 74.00        | 24.47       | 1000.0          | 9.000           | Single Line | 9.6        |
| 0.685000        | 52.50            | ---             | 87.00        | 34.50       | 1000.0          | 9.000           | Single Line | 9.6        |
| 3.870000        | ---              | 54.21           | 74.00        | 19.79       | 1000.0          | 9.000           | Single Line | 9.7        |
| 3.870000        | 54.71            | ---             | 87.00        | 32.29       | 1000.0          | 9.000           | Single Line | 9.7        |
| 13.200000       | ---              | 66.24           | 74.00        | 7.76        | 1000.0          | 9.000           | Single Line | 9.6        |
| 13.200000       | 66.68            | ---             | 87.00        | 20.32       | 1000.0          | 9.000           | Single Line | 9.6        |

### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

- DC 12 V Mode

| Frequency | Amplitude    | ANT             | ANT. Height | Correction Factor |               | Corrected Amplitude | Applicable Limit | Margin |
|-----------|--------------|-----------------|-------------|-------------------|---------------|---------------------|------------------|--------|
| [MHz]     | [dB $\mu$ V] | Polar.<br>(H/V) | [m]         | ANT.<br>[dB/m]    | Cable<br>[dB] | [dB $\mu$ V/m]      | [dB $\mu$ V/m]   | [dB]   |
| 140.52    | 9.72         | H               | 3.70        | 7.86              | 3.45          | 21.03               | 40.00            | 18.97  |
| 225.79    | 10.52        | V               | 1.00        | 11.87             | 4.43          | 26.82               | 40.00            | 13.18  |
| 351.20    | 11.82        | H               | 3.58        | 14.57             | 5.65          | 32.04               | 47.00            | 14.96  |
| 375.38    | 7.81         | V               | 1.14        | 15.13             | 5.91          | 28.85               | 47.00            | 18.15  |
| 600.34    | 7.43         | V               | 1.28        | 19.30             | 7.83          | 34.56               | 47.00            | 12.44  |
| 702.46    | 8.67         | H               | 4.00        | 19.73             | 8.55          | 36.95               | 47.00            | 10.05  |

\* H : Horizontal, V : Vertical

## ◆ Calculation

Corrected Amplitude [dB $\mu$ V] = Amplitude[dBuV] + Correction Factor [dB]Corrected Amplitude : The Final Value, Amplitude : Reading Value,  
Correction Factor : ANT FACTOR + Cable loss

- PoE Mode

| Frequency | Amplitude    | ANT             | ANT. Height | Correction Factor |               | Corrected Amplitude | Applicable Limit | Margin |
|-----------|--------------|-----------------|-------------|-------------------|---------------|---------------------|------------------|--------|
| [MHz]     | [dB $\mu$ V] | Polar.<br>(H/V) | [m]         | ANT.<br>[dB/m]    | Cable<br>[dB] | [dB $\mu$ V/m]      | [dB $\mu$ V/m]   | [dB]   |
| 65.80     | 8.75         | H               | 3.82        | 10.94             | 2.33          | 22.02               | 40.00            | 17.98  |
| 148.39    | 9.50         | V               | 1.26        | 8.14              | 3.55          | 21.19               | 40.00            | 18.81  |
| 243.46    | 7.51         | H               | 3.74        | 12.26             | 4.64          | 24.41               | 47.00            | 22.59  |
| 374.81    | 10.16        | H               | 4.00        | 15.12             | 5.90          | 31.18               | 47.00            | 15.82  |
| 602.16    | 7.39         | V               | 1.21        | 19.31             | 7.84          | 34.54               | 47.00            | 12.46  |
| 642.01    | 8.13         | V               | 1.00        | 19.47             | 8.10          | 35.70               | 47.00            | 11.30  |

\* H : Horizontal, V : Vertical

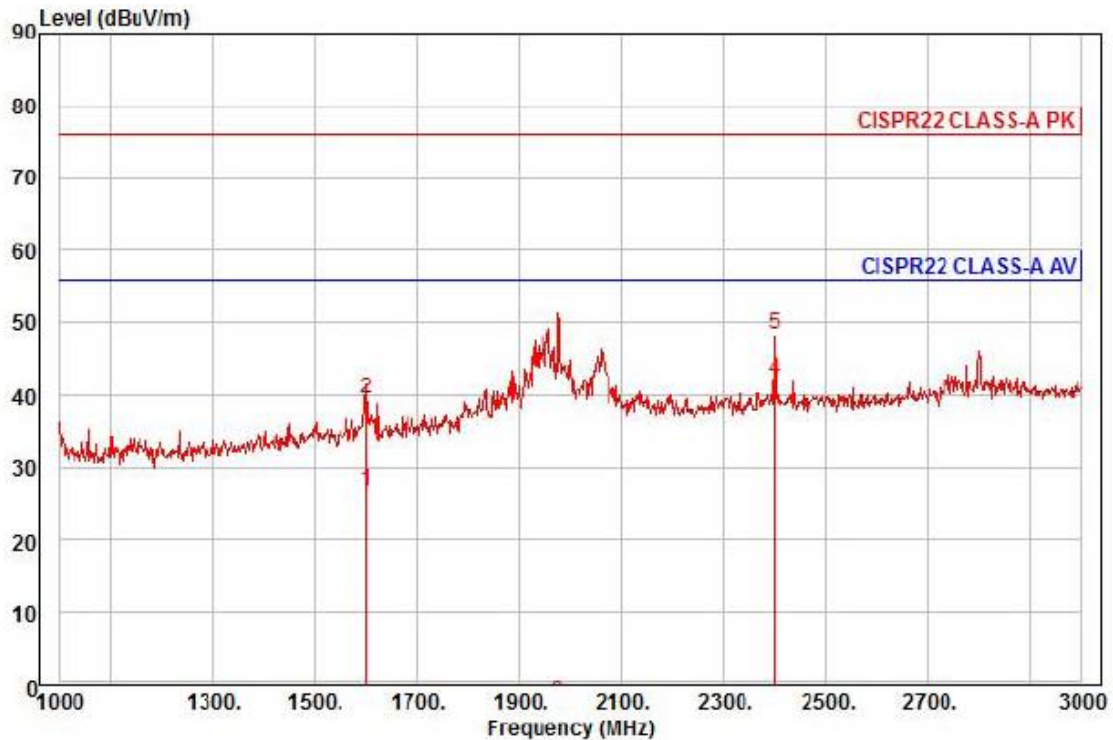
## ◆ Calculation

Corrected Amplitude [dB $\mu$ V] = Amplitude[dBuV] + Correction Factor [dB]Corrected Amplitude : The Final Value, Amplitude : Reading Value,  
Correction Factor : ANT FACTOR + Cable loss



## Radiated Electric Field Emissions(Above 1 GHz)

- 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 : XND-8080RP  
Mode : DC 12 V  
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    | 1600.00 | 31.46      | 26.29      | 8.31       | 39.22         | 316  | 56.00      | -29.16     | horizontal | Average |
| 2    | 1600.00 | 44.22      | 26.29      | 8.31       | 39.22         | 316  | 76.00      | -36.40     | horizontal | Peak    |
| 3    | 1976.00 | 0.01       | 27.78      | 9.27       | 39.40         | 242  | 76.00      | -78.34     | horizontal | Peak    |
| 4 pp | 2400.00 | 42.37      | 28.86      | 10.32      | 39.42         | 100  | 56.00      | -13.87     | horizontal | Average |
| 5 pk | 2400.00 | 48.64      | 28.86      | 10.32      | 39.42         | 100  | 76.00      | -27.60     | horizontal | Peak    |

### ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



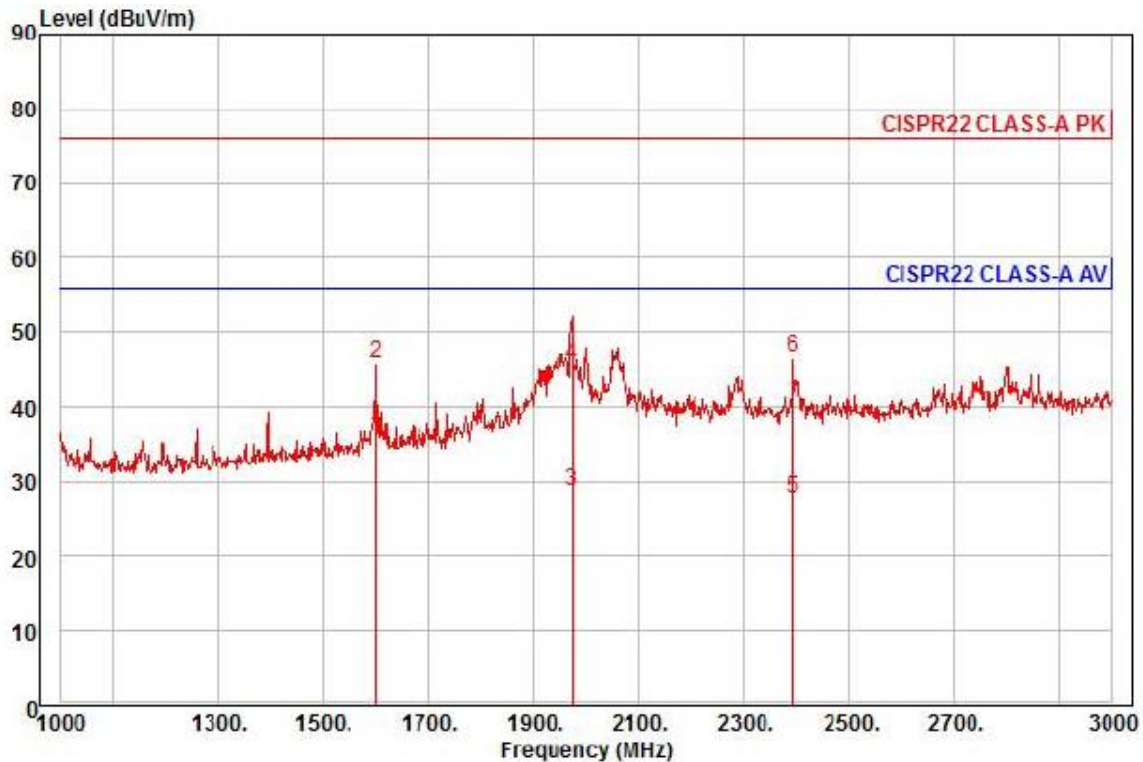
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Test report No.:

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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 :  
Model : XND-8080RP  
Mode : DC 12 V  
Memo : 1 ~ 3 GHz

|      |         | Read  | Ant    | Cable | Preamp | TPos | Limit  | Over   |           |         |
|------|---------|-------|--------|-------|--------|------|--------|--------|-----------|---------|
|      | Freq    | Level | Factor | Loss  | Factor |      | Line   | Limit  | Pol/Phase | Remark  |
|      | MHz     | dBuV  | dB/m   | dB    | dB     | deg  | dBuV/m | dB     |           |         |
| 1 pp | 1600.00 | 40.55 | 26.29  | 8.31  | 39.22  | 359  | 56.00  | -20.07 | vertical  | Average |
| 2    | 1600.00 | 50.55 | 26.29  | 8.31  | 39.22  | 359  | 76.00  | -30.07 | vertical  | Peak    |
| 3    | 1974.00 | 31.01 | 27.78  | 9.27  | 39.40  | 9    | 56.00  | -27.34 | vertical  | Average |
| 4    | 1974.00 | 48.05 | 27.78  | 9.27  | 39.40  | 9    | 76.00  | -30.30 | vertical  | Peak    |
| 5    | 2394.00 | 27.96 | 28.85  | 10.31 | 39.42  | 0    | 56.00  | -28.30 | vertical  | Average |
| 6 pk | 2394.00 | 46.90 | 28.85  | 10.31 | 39.42  | 0    | 76.00  | -29.36 | vertical  | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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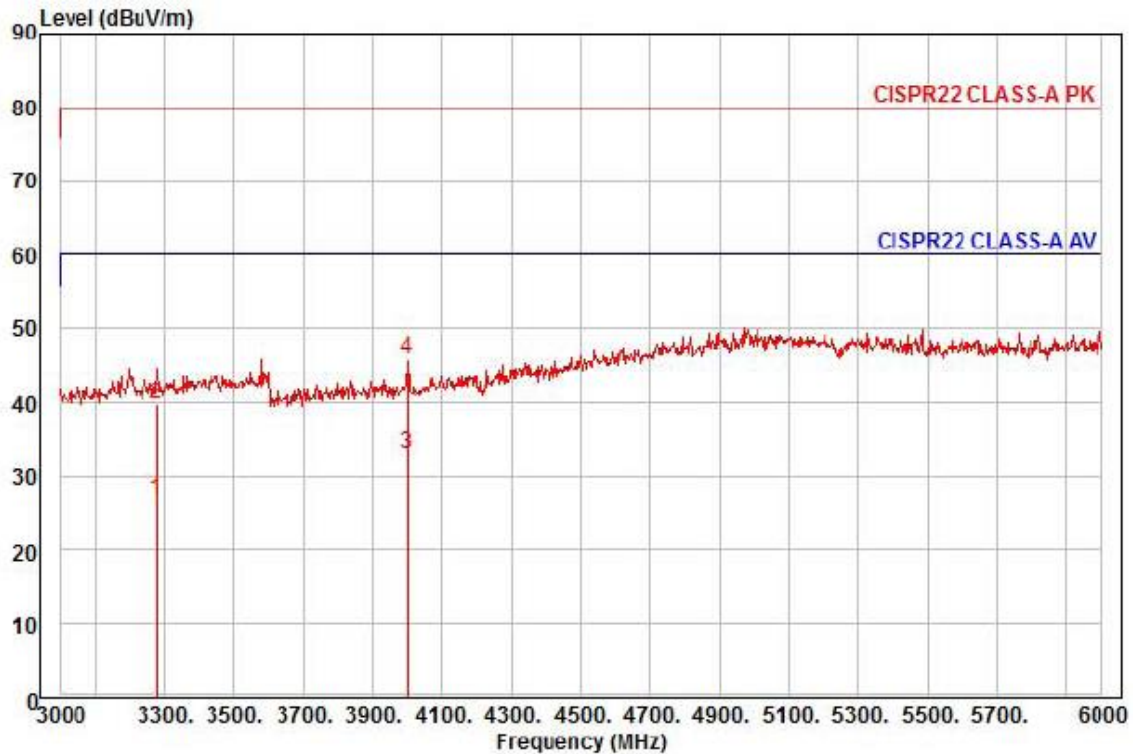
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Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RP  
Mode : DC 12 V  
Memo : 3 ~ 6 GHz

|      | 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    | 3279.00 | 24.20      | 30.80      | 12.21      | 40.54         | 268  | 60.00      | -33.33     | horizontal | Average |
| 2    | 3279.00 | 37.36      | 30.80      | 12.21      | 40.54         | 268  | 80.00      | -40.17     | horizontal | Peak    |
| 3 pp | 3999.00 | 28.31      | 32.01      | 13.56      | 40.70         | 18   | 60.00      | -26.82     | horizontal | Average |
| 4 pk | 3999.00 | 40.95      | 32.01      | 13.56      | 40.70         | 18   | 80.00      | -34.18     | horizontal | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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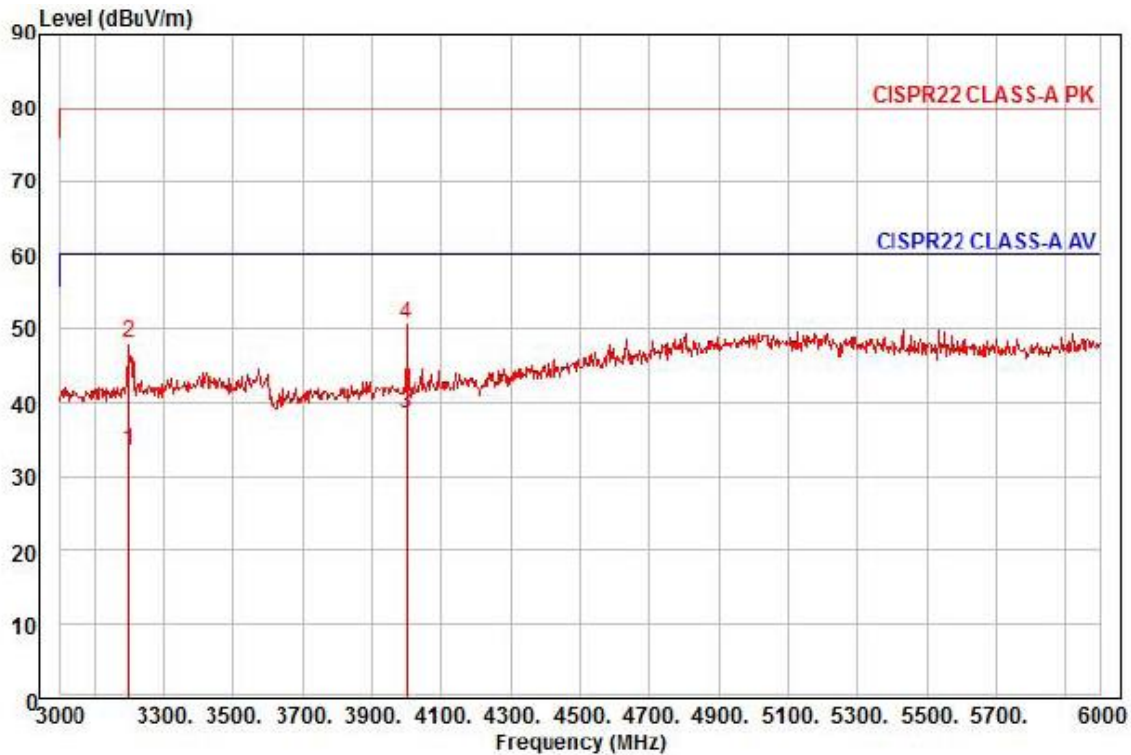
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Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RP  
Mode : DC 12 V  
Memo : 3 ~ 6 GHz

|      | 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    | 3198.00 | 31.32      | 30.66      | 12.05      | 40.41         | 20   | 60.00      | -26.38     | vertical  | Average |
| 2    | 3198.00 | 45.79      | 30.66      | 12.05      | 40.41         | 20   | 80.00      | -31.91     | vertical  | Peak    |
| 3 pp | 3999.00 | 33.58      | 32.01      | 13.56      | 40.70         | 323  | 60.00      | -21.55     | vertical  | Average |
| 4 pk | 3999.00 | 45.80      | 32.01      | 13.56      | 40.70         | 323  | 80.00      | -29.33     | vertical  | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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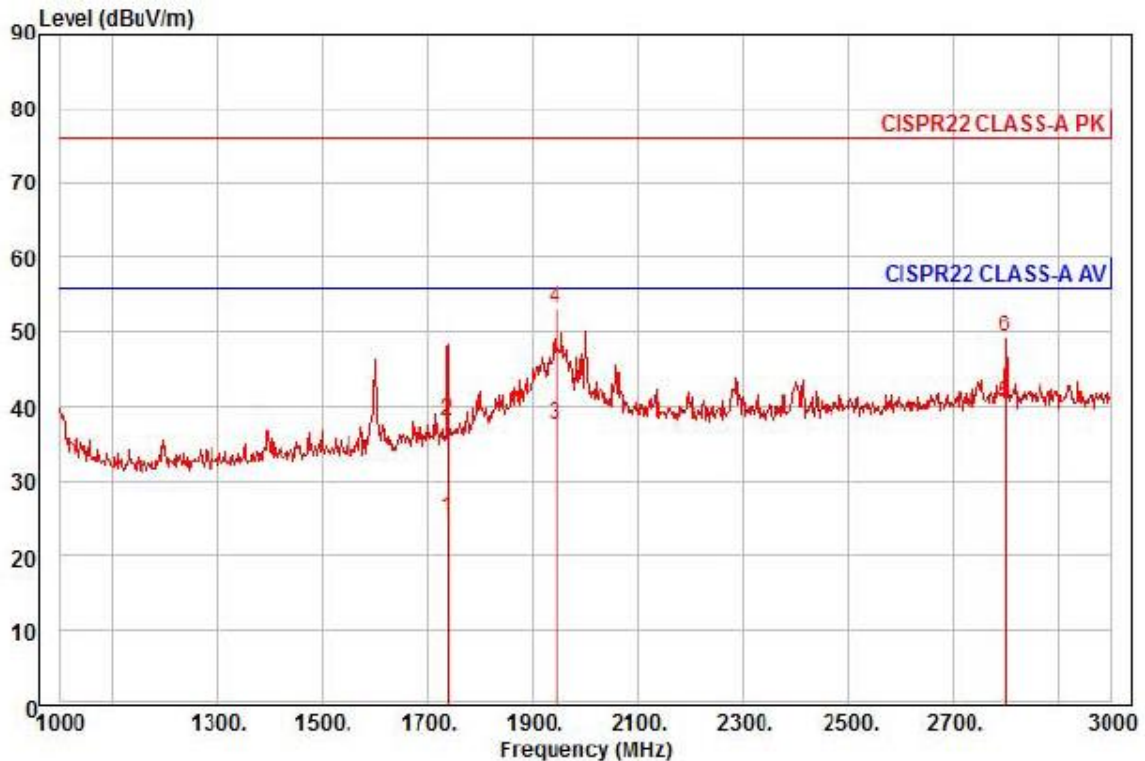
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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Test report No.:

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## - 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 : XND-8080RP  
Mode : POE  
Memo : 1 ~ 3 GHz

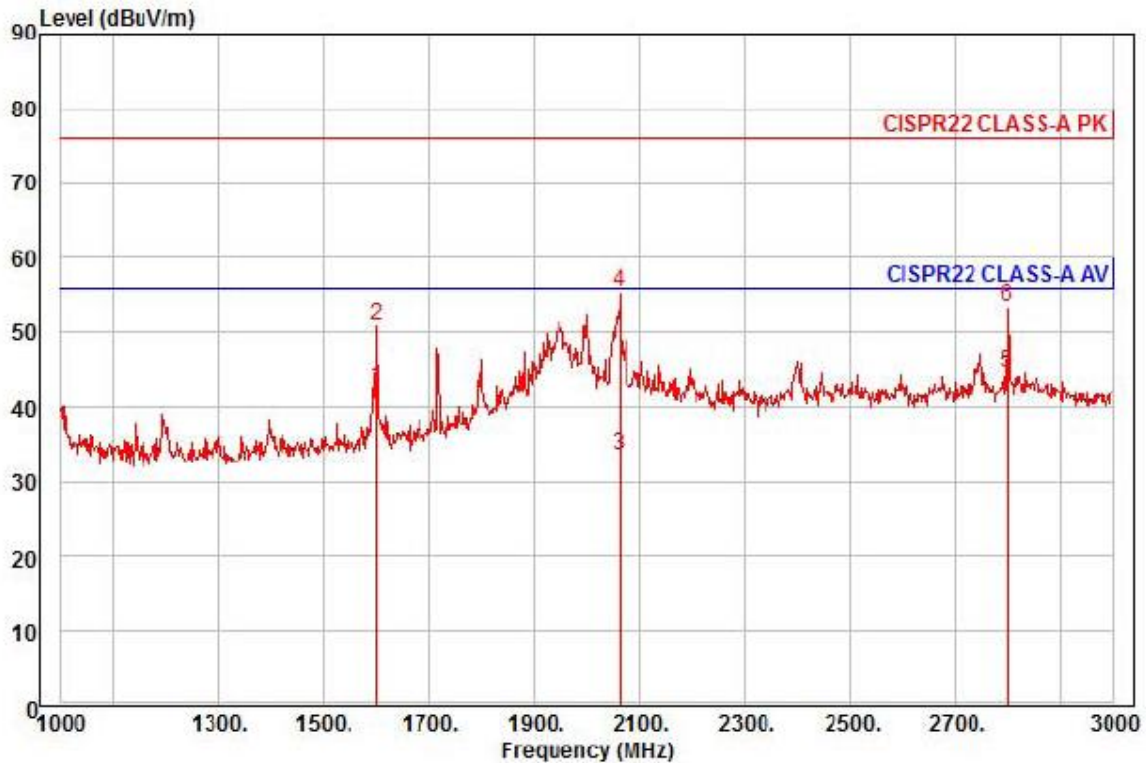
|      | Freq    | Read Level | Ant Factor | Cable Loss | Preamp Factor | TPos | Limit Line | Over Limit | Pol/Phase  | Remark  |
|------|---------|------------|------------|------------|---------------|------|------------|------------|------------|---------|
|      | MHz     | dBuV       | dB/m       | dB         | dB            | deg  | dBuV/m     | dB         |            |         |
| 1    | 1738.00 | 28.78      | 26.84      | 8.67       | 39.29         | 19   | 56.00      | -31.00     | horizontal | Average |
| 2    | 1738.00 | 41.75      | 26.84      | 8.67       | 39.29         | 19   | 76.00      | -38.03     | horizontal | Peak    |
| 3    | 1944.00 | 40.02      | 27.66      | 9.19       | 39.38         | 191  | 56.00      | -18.51     | horizontal | Average |
| 4 pk | 1944.00 | 55.71      | 27.66      | 9.19       | 39.38         | 191  | 76.00      | -22.82     | horizontal | Peak    |
| 5 pp | 2800.00 | 39.26      | 29.84      | 11.23      | 39.88         | 114  | 56.00      | -15.55     | horizontal | Average |
| 6    | 2800.00 | 47.99      | 29.84      | 11.23      | 39.88         | 114  | 76.00      | -26.82     | horizontal | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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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 :  
Model : XND-8080RP  
Mode : POE  
Memo : 1 ~ 3 GHz

|      | Read    | Ant    | Cable | Preamp | TPos  | Limit  | Over  |           |          |
|------|---------|--------|-------|--------|-------|--------|-------|-----------|----------|
| Freq | Level   | Factor | Loss  | Factor |       | Line   | Limit | Pol/Phase | Remark   |
| MHz  | dBuV    | dB/m   | dB    | dB     | deg   | dBuV/m | dB    |           |          |
| 1    | 1600.00 | 47.28  | 26.29 | 8.31   | 39.22 | 131    | 56.00 | -13.34    | vertical |
| 2    | 1600.00 | 55.53  | 26.29 | 8.31   | 39.22 | 131    | 76.00 | -25.09    | vertical |
| 3    | 2062.00 | 35.51  | 28.03 | 9.48   | 39.41 | 302    | 56.00 | -22.39    | vertical |
| 4 pk | 2062.00 | 57.27  | 28.03 | 9.48   | 39.41 | 302    | 76.00 | -20.63    | vertical |
| 5 pp | 2800.00 | 43.48  | 29.84 | 11.23  | 39.88 | 341    | 56.00 | -11.33    | vertical |
| 6    | 2800.00 | 52.20  | 29.84 | 11.23  | 39.88 | 341    | 76.00 | -22.61    | vertical |

#### ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



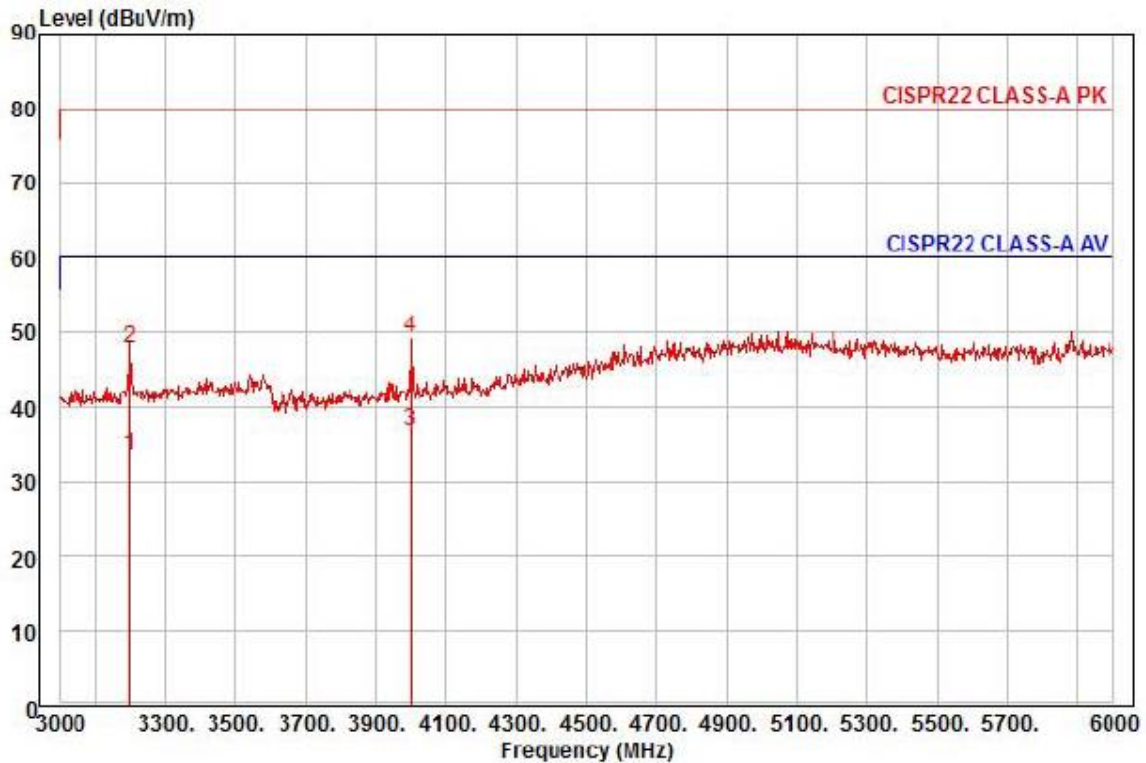
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Test report No.:

KES-E1-16T0652-R1

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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 :  
Model : XND-8080RP  
Mode : P0E  
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    | 3198.00 | 31.28      | 30.66      | 12.05      | 40.41         | 203  | 60.00      | -26.42     | horizontal | Average |
| 2    | 3198.00 | 45.47      | 30.66      | 12.05      | 40.41         | 203  | 80.00      | -32.23     | horizontal | Peak    |
| 3 pp | 3999.00 | 31.93      | 32.01      | 13.56      | 40.70         | 359  | 60.00      | -23.20     | horizontal | Average |
| 4 pk | 3999.00 | 44.40      | 32.01      | 13.56      | 40.70         | 359  | 80.00      | -30.73     | horizontal | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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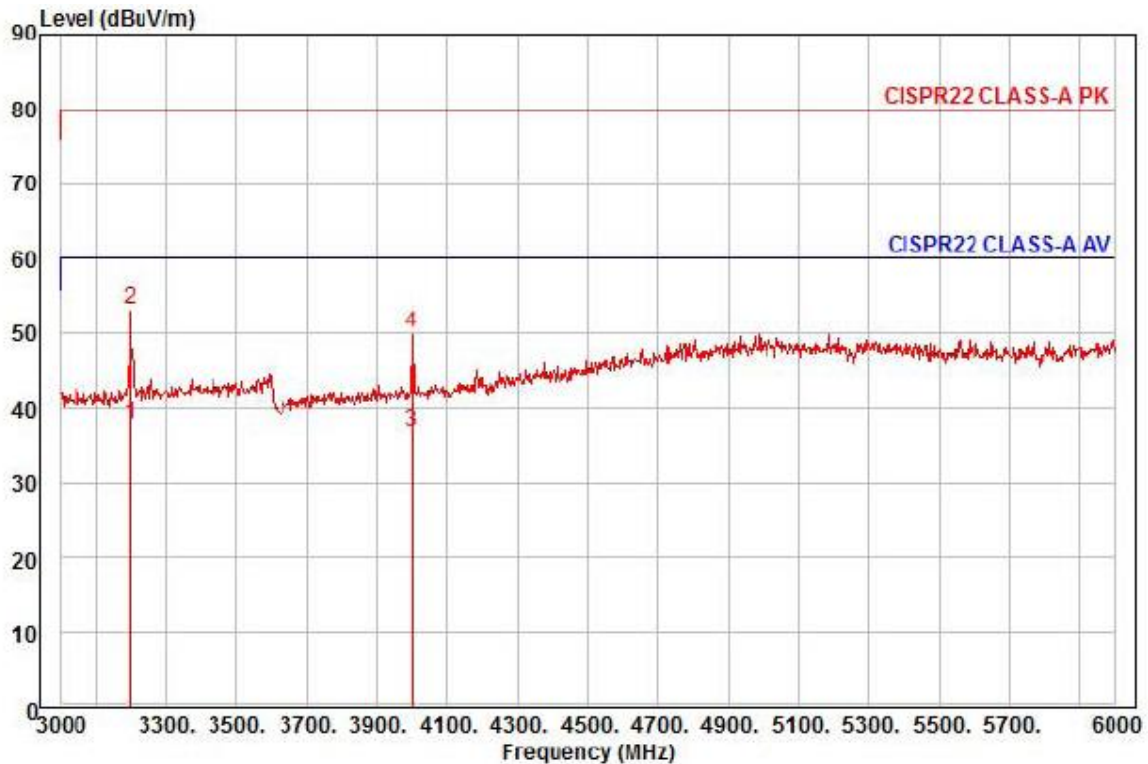
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Test report No.:

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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 :  
Model : XND-8080RP  
Mode : POE  
Memo : 3 ~ 6 GHz

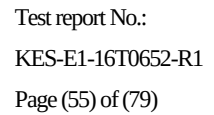
|   |      | Read    | Ant    | Cable | Preamp | TPos  | Limit  | Over  |                 |         |
|---|------|---------|--------|-------|--------|-------|--------|-------|-----------------|---------|
|   | Freq | Level   | Factor | Loss  | Factor |       | Line   | Limit | Pol/Phase       | Remark  |
|   | MHz  | dBuV    | dB/m   | dB    | dB     | deg   | dBuV/m | dB    |                 |         |
| 1 | pp   | 3198.00 | 35.38  | 30.66 | 12.05  | 40.41 | 224    | 60.00 | -22.32 vertical | Average |
| 2 | pk   | 3198.00 | 50.88  | 30.66 | 12.05  | 40.41 | 224    | 80.00 | -26.82 vertical | Peak    |
| 3 |      | 3999.00 | 31.93  | 32.01 | 13.56  | 40.70 | 347    | 60.00 | -23.20 vertical | Average |
| 4 |      | 3999.00 | 45.14  | 32.01 | 13.56  | 40.70 | 347    | 80.00 | -29.99 vertical | Peak    |

## ◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,  
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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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

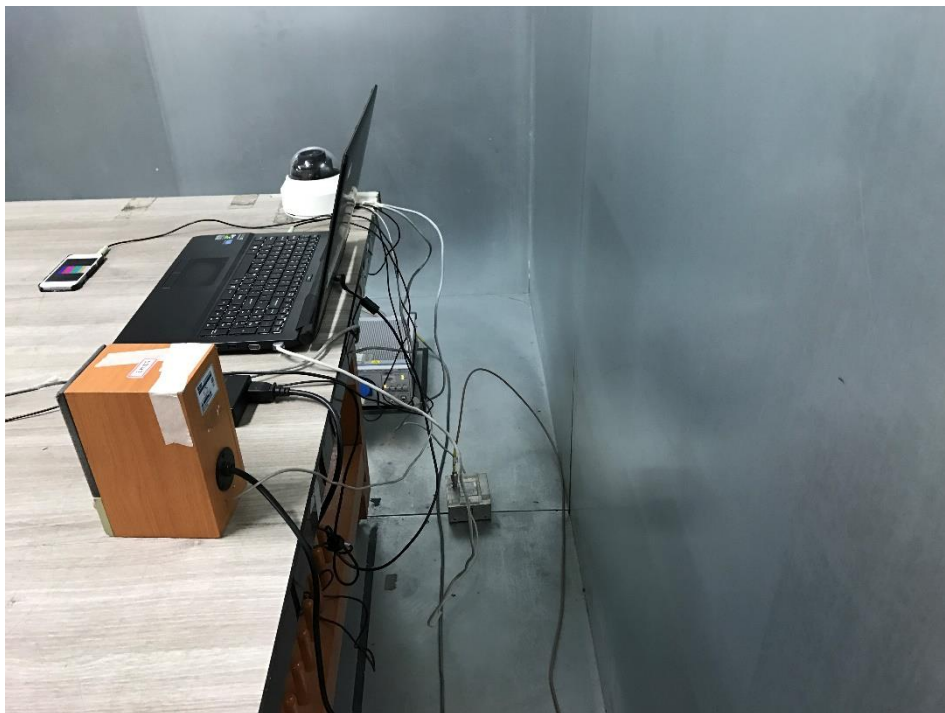
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## Conducted Telecommunication Emissions

- DC 12 V Mode



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- PoE Mode



## Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



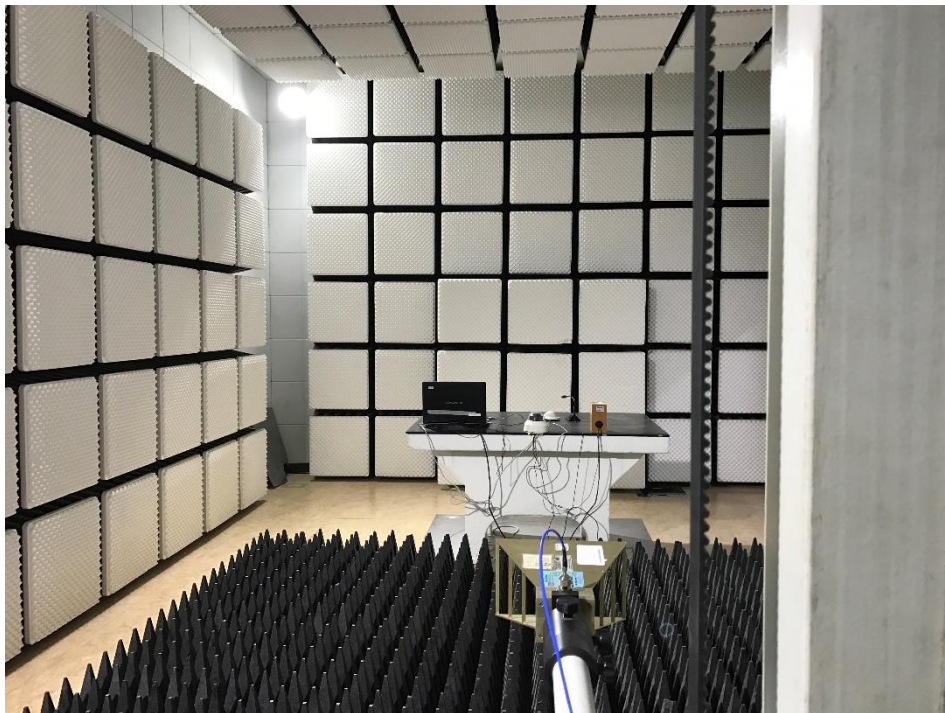
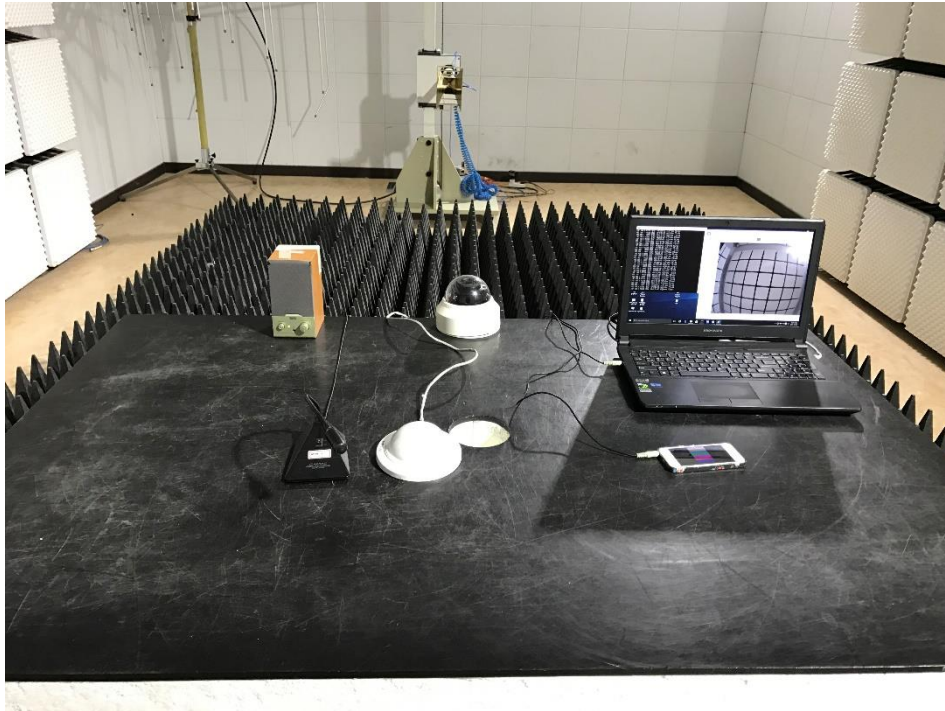
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**- PoE Mode**

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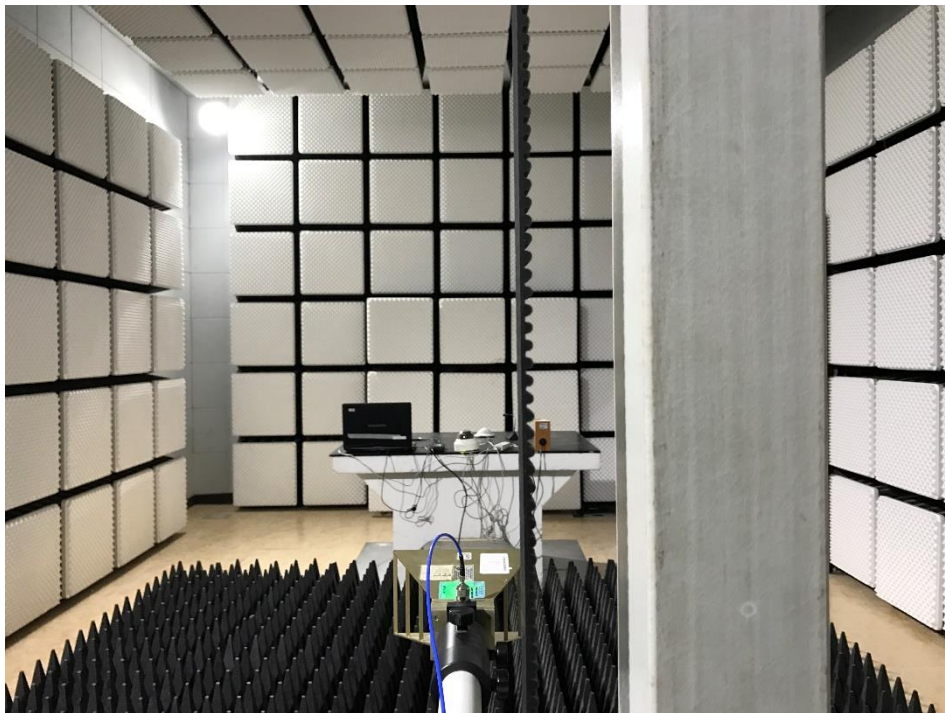
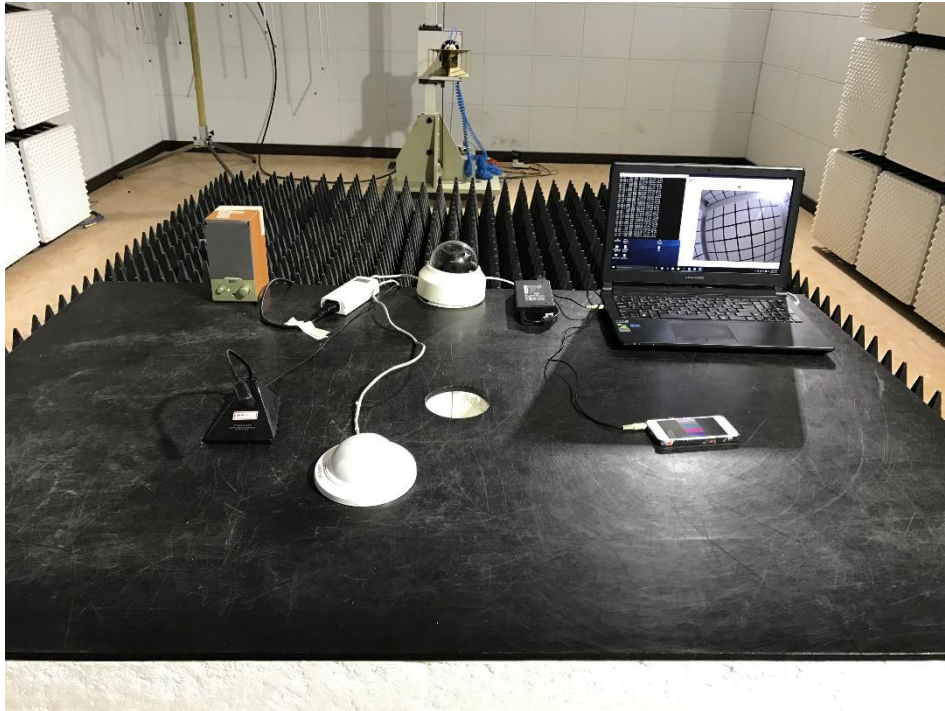
## Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V 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

### - DC 12 V Mode



### - PoE Mode



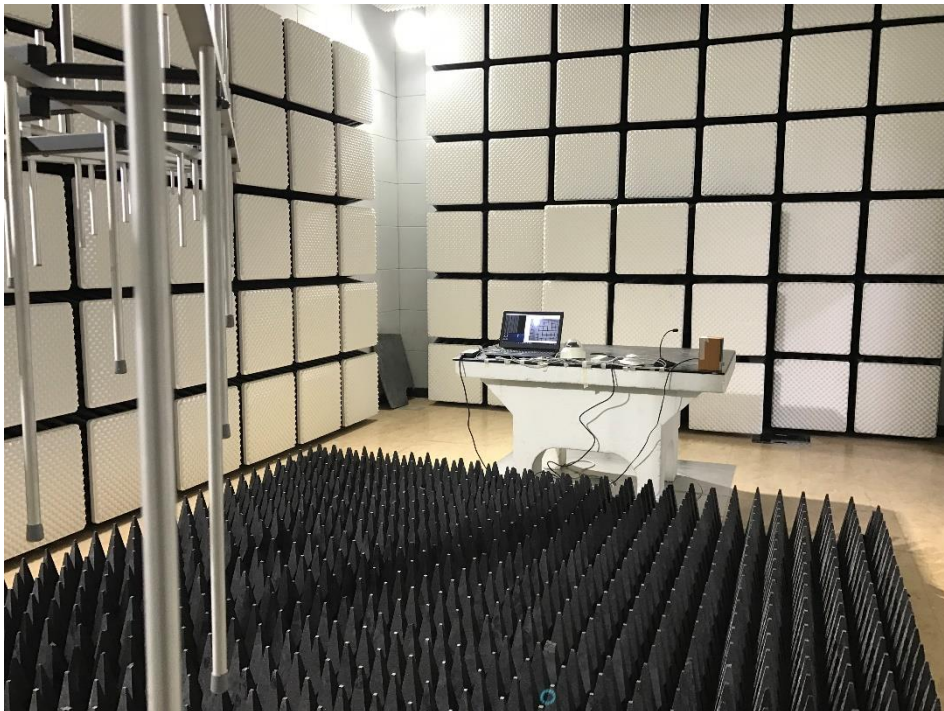
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## Radiated Electric Field Immunity

### - DC 12 V Mode



### - PoE Mode



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## Electrical Fast Transients / Bursts

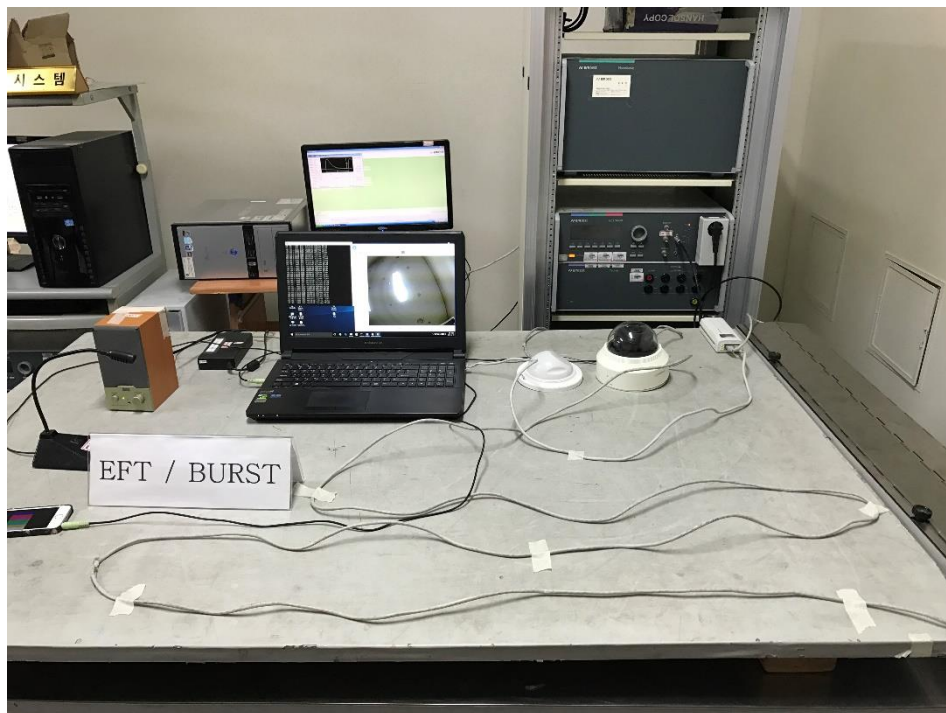
- DC 12 V Mode



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- PoE Mode

N/A



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## Surge Transients

### - DC 12 V Mode



### - PoE Mode



## Conducted Disturbance

- DC 12 V Mode



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- PoE Mode

N/A





**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
[www.kes.co.kr](http://www.kes.co.kr)

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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)

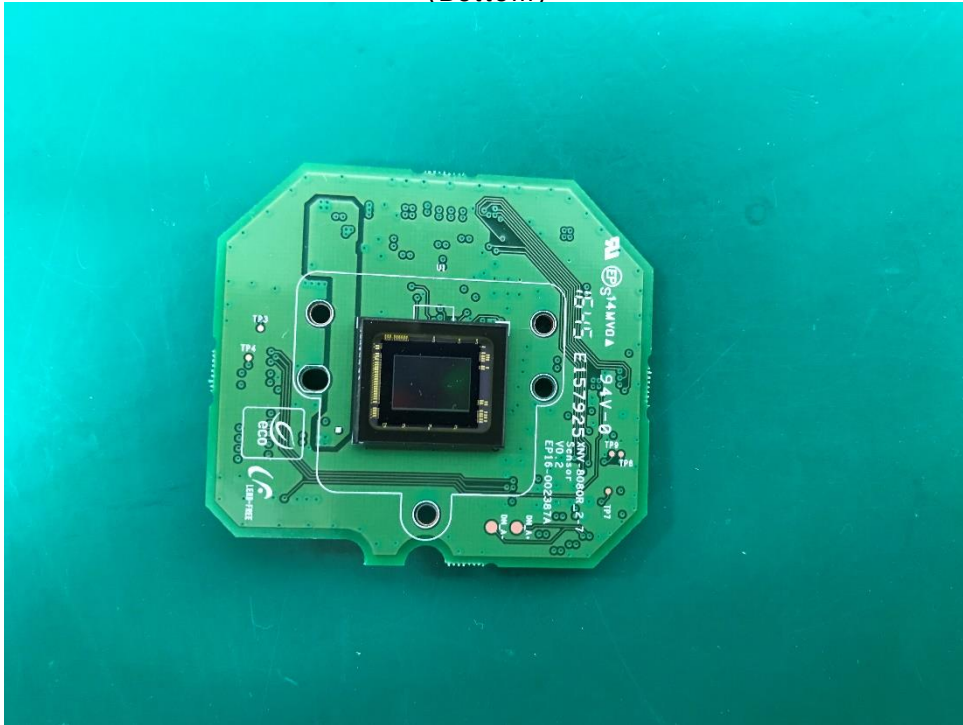


## EUT Internal View – board 1

(Top)



(Bottom)



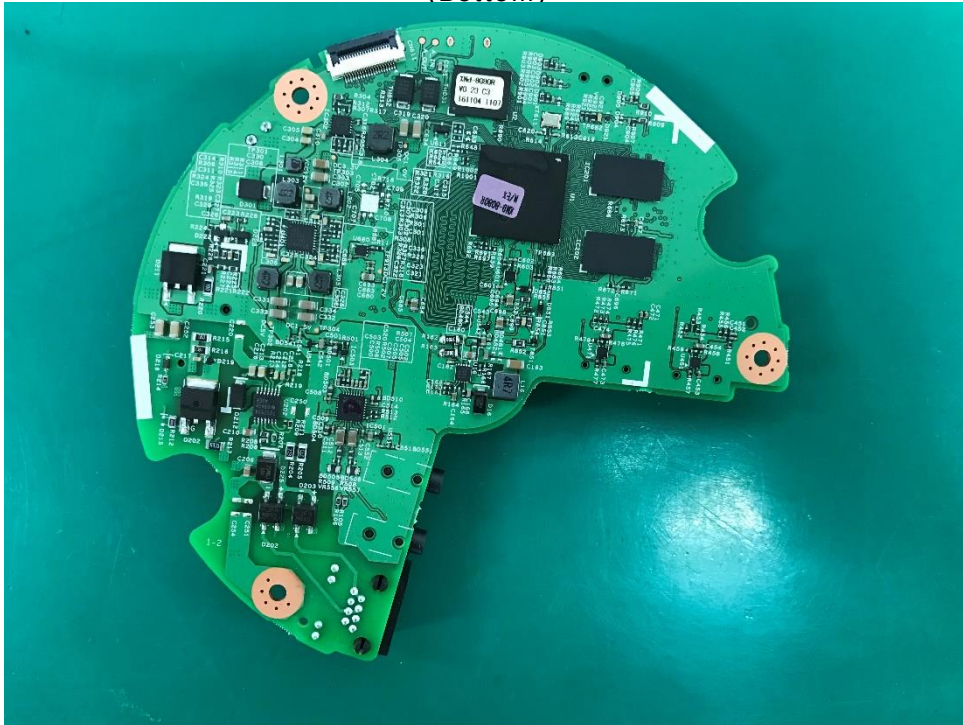
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## EUT Internal View – board 2

(Top)



(Bottom)



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## EUT Internal View – Board 3

(Top)



(Bottom)



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## Label and Location



### NETWORK CAMERA

Model No : XND-8080R

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

Made in China

