



## EMC TEST REPORT For RCM

Test Report No. : KES-E1-18T0069-R1  
Date of Issue : Feb. 24, 2023  
Product name : Network Camera  
Model/Type No. : XNV-6022R  
Variant Model : -  
Applicant : Hanwha Vision Co., Ltd  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED  
2. D-TECH CO.,LTD.  
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,  
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,  
Korea (Suwon Industrial Complex)  
Date of Receipt : Dec. 21, 2017  
Test date : Dec. 27, 2017 ~ Dec. 28, 2017  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Il, Lee  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

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



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### REPORT REVISION HISTORY

| Date          | Test Report No.   | Revision History                                                                                              |
|---------------|-------------------|---------------------------------------------------------------------------------------------------------------|
| Jan. 09, 2018 | KES-E1-18T0069    | Issued                                                                                                        |
| Feb. 24, 2023 | KES-E1-18T0069-R1 | Change the Applicant, Applicant Address, Manufacturer and Manufacturer Address at the request of the customer |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |
|               |                   |                                                                                                               |

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## 1.0 General Product Description

### Main Specifications of EUT are:

| Video                       |                                                                                                                                                                                                                                                                     |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imaging Device              | 1/2.8" 2M CMOS                                                                                                                                                                                                                                                      |
| Total Pixels                | 1945(H) x 1109(V) 2.16M                                                                                                                                                                                                                                             |
| Effective Pixels            | 1945(H) x 1097(V) 2.13M                                                                                                                                                                                                                                             |
| Scanning System             | Progressive Scan                                                                                                                                                                                                                                                    |
| Min. Illumination           | Color : 0.055 lux(F2.0, 1/30sec) (TBD)<br>B/W : 0Lux(IR LED On)                                                                                                                                                                                                     |
| S / N Ratio                 | 50dB                                                                                                                                                                                                                                                                |
| Video Out                   | USB : Micro USB type B, 1280x720, for installation                                                                                                                                                                                                                  |
| Lens                        |                                                                                                                                                                                                                                                                     |
| Focal Length (Zoom Ratio)   | 3.6mm Fixed                                                                                                                                                                                                                                                         |
| Max. Aperture Ratio         | F2.0                                                                                                                                                                                                                                                                |
| Angular Field of View       | H 96.4° V 50.5° D 116° (TBD)                                                                                                                                                                                                                                        |
| Min. Object Distance        | TBD                                                                                                                                                                                                                                                                 |
| Focus Control               | Manual                                                                                                                                                                                                                                                              |
| Lens Type                   | Fixed                                                                                                                                                                                                                                                               |
| Mount Type                  | Board-in type                                                                                                                                                                                                                                                       |
| Pan / Tilt / Rotate         |                                                                                                                                                                                                                                                                     |
| Pan / Tilt / Rotate range   | ±5°/0-67°/±90°                                                                                                                                                                                                                                                      |
| Operational                 |                                                                                                                                                                                                                                                                     |
| IR Viewable Length          | 15m(49.21ft)                                                                                                                                                                                                                                                        |
| 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),<br>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          | 150dB                                                                                                                                                                                                                                                               |
| Contrast Enhancement        | SSDR (Off / On)                                                                                                                                                                                                                                                     |
| Digital Noise Reduction     | SSNR5 (2D+3D Noise Filter) (Off / On)                                                                                                                                                                                                                               |
| Digital Image Stabilization | Off / On                                                                                                                                                                                                                                                            |
| Defog                       | Auto(input from fog detection) / Manual / Off                                                                                                                                                                                                                       |
| Motion Detection            | Off/ On(8ea, 8point Polygonal zones), Handover                                                                                                                                                                                                                      |

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|                          |                                                                                                                                                                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Privacy Masking          | Off / On (32ea, polygonal zones)<br>- Color : Grey/Green/Red/Blue/Black/White<br>- Mosaic                                                                                                                                                    |
| Gain Control             | Off / Low / Middle / High                                                                                                                                                                                                                    |
| 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°                                                                                                                                                                                  |
| Video & Audio Analytics  | Tampering, Loitering, Directional Detection, Defocus Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Digital Auto Tracking, Sound Classification, People counting |
| Alarm I/O                | -                                                                                                                                                                                                                                            |
| Alarm Triggers           | 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), <b>Built-in microphone</b><br>Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm                                                                                                                      |
| Audio Noise Reduction    | Off / On                                                                                                                                                                                                                                     |
| Pixel Counter            | Support                                                                                                                                                                                                                                      |

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| Network                  |                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet                 | RJ45 (10/100BASE-T)                                                                                                                                                                 |
| Video Compression Form   | H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG                                                                                                                 |
| Resolution               | 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240                                                                   |
| Max. Framerate           | H.265/H.264 : Max. 60fps at all resolutions<br>Motion JPEG : Max. 30fps                                                                                                             |
| Smart Codec              | Manual Mode (area-based : 5EA)                                                                                                                                                      |
| WiseStream II            | 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<br>MJPEG : VBR                                                                                                                                             |
| Streaming Capability     | Multiple Streaming (Up to 10 Profiles)                                                                                                                                              |
| Audio Compression Form   | G.711 u-law /G.726 Selectable<br>G.726 (ADPCM) 8KHz, G.711 8KHz<br>G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps<br>AAC-LC : 48Kbps at 16KHz                                               |
| Audio Communication      | Bi-dierctional (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 1slot (up to 256 GB)<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, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek                                                                                                                                                                     |
| Web Viewer                       | Supported OS: Windows 7, 8.1, 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(Window 64bit only) , 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 | -30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH<br>*Start up should be done at above -20°C                                                                                                                                                                                                                             |
| Storage Temperature / Humidity   | -50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                                        |
| Ingress Protection               | IP66                                                                                                                                                                                                                                                                                                                     |
| Vibration Resistance             | EN55011:2009+A1:2010, EN50581:2012,EN50121-3-2:2015, EN61000-4-2:2009<br>EN61000-4-3:2006+A2:2010, EN61000-4-4:2012, EN61000-4-5:2014<br>EN61000-4-6:2009, EN50155:2007, NEMA 4X                                                                                                                                         |
| Vandal Resistance                | IK10, NEMA4X                                                                                                                                                                                                                                                                                                             |
| <b>Electrical</b>                |                                                                                                                                                                                                                                                                                                                          |
| Input Voltage / Current          | PoE(IEEE802.3af,Class3)                                                                                                                                                                                                                                                                                                  |
| Power Consumption                | TBD                                                                                                                                                                                                                                                                                                                      |
| <b>Mechanical</b>                |                                                                                                                                                                                                                                                                                                                          |
| Color / Material                 | Ivory / Metal                                                                                                                                                                                                                                                                                                            |
| Dimension (WxHxD)                | 99 x 52 x 100                                                                                                                                                                                                                                                                                                            |
| Weight                           | 296g(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 ☐ 240 Vac ☐ 100 Vac ☐ 24 Vac ☐ 12 Vdc ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                                | Remarks |
|----------------|--------------|---------------|---------------------------------------------|---------|
| Network Camera | XNV-6022R    | -             | HANWHA VISION<br>VIETNAM COMPANY<br>LIMITED | E.U.T   |

## 1.5 Support Equipments

| Description               | Model Number | Serial Number                 | Manufacturer                                      | Remarks |
|---------------------------|--------------|-------------------------------|---------------------------------------------------|---------|
| PoE Adaptor               | ANY4805C-LT1 | 10H300002                     | ANY ELECTRONICS CO.,<br>LTD                       | -       |
| Notebook                  | NT630Z5J     | JK9091EF400142M               | SAMSUNG ELECTRONICS<br>CO., LTD.                  | -       |
| Notebook<br>AC/DC Adaptor | A13-040N2A   | CN60BA4400313AD0<br>N843KO200 | Chicony Power<br>Technology (suzhou)<br>Co., Ltd. | -       |
| Micro SD Card             | -            | -                             | SanDisk                                           | -       |
| MIC                       | CMK-303      | -                             | CAMAC                                             | -       |



## 1.6 External I/O Cabling

| Start                  |               | END           |               | Cable Spec. |        |
|------------------------|---------------|---------------|---------------|-------------|--------|
| Description            | I/O Port      | Description   | I/O Port      | Length      | Shield |
| Network Camera (E.U.T) | RJ-45         | PoE Adaptor   | RJ-45         | 3.0         | U      |
| PoE Adaptor            | RJ-45         | Notebook      | RJ-45         | 3.0         | U      |
| Network Camera (E.U.T) | Micro SD Slot | Micro SD Card | Micro SD Slot | -           | -      |
| Network Camera (E.U.T) | 3.5 mm        | MIC           | 3.5 mm        | 1.7         | U      |

\* Unshielded=U, Shielded=S

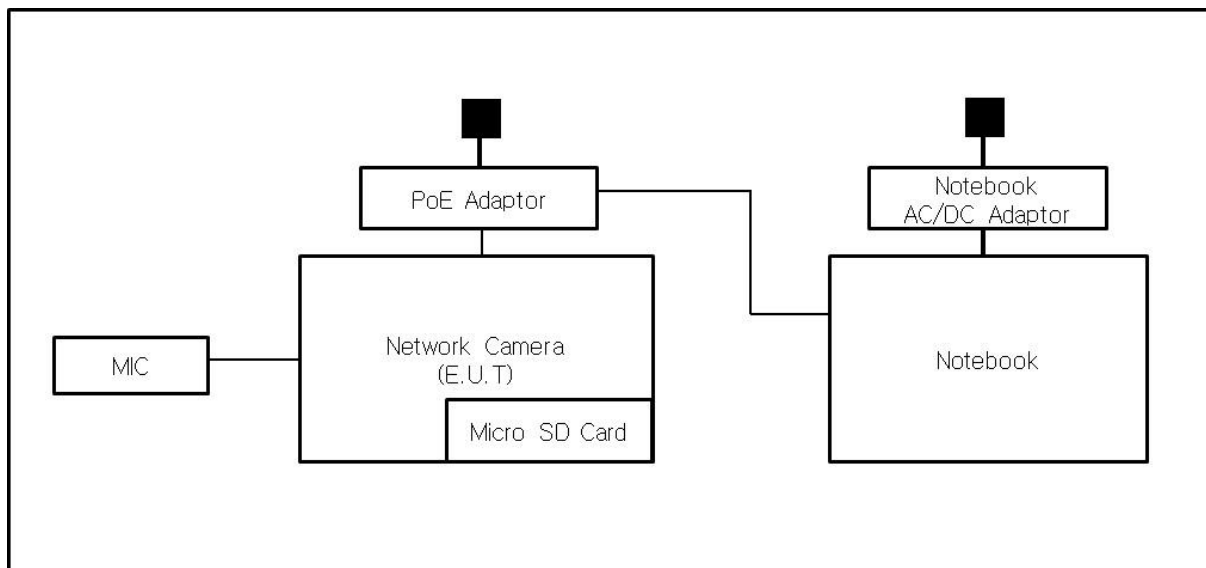
## 1.7 EUT Operating Mode(s)

| Test mode | operating                   |
|-----------|-----------------------------|
| PoE       | E.U.T Monitoring, Ping Test |

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

## 1.8 Configuration

■ AC Main  
 □ DC Main



## 1.9 Remarks when standards applied

N/A

## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

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

## 1.12 Laboratory Accreditations and Listings

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



## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 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 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- |                                                                |                                             |                                  |
|----------------------------------------------------------------|---------------------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI V-3 / 2015.04</b>             | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> <b>AS/NZS CISPR32:2013</b> | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>      |                                             |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010                | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2009                       |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b>  |                                             |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                   | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                       |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>       |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> EN 301 489-1 V1.9.2                   |                                             |                                  |
| <input type="checkbox"/> Equipment for fixed use               |                                             |                                  |
| <input type="checkbox"/> Equipment for vehicular use           |                                             |                                  |
| <input type="checkbox"/> Equipment for portable use            |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> EN 301 489-3 V1.6.1                   |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1                  |                                             |                                  |
| <br>                                                           |                                             |                                  |
| <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 #6

### Test Equipment

| Used                     | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101781        | 04, 27, 2018 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 05, 2019 |
| <input type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 27, 2018 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 27, 2018 |
| <input type="checkbox"/> | LISN              | NNBM8124     | SCHWARZBECK  | 8124-1002     | 08, 07, 2018 |
| <input type="checkbox"/> | LISN              | NNBM8124     | SCHWARZBECK  | 8124-1003     | 08, 07, 2018 |

### Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

### Remarks

N/A

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Dec. 28, 2017

### Test Location

Electro wave Shieldroom #6

### Test Equipment

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101781        | 04, 27, 2018 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 05, 2019 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 27, 2018 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 27, 2018 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 01, 07, 2019 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 01, 07, 2019 |
| <input type="checkbox"/>            | ISN               | ISN S8       | SCHWARZBECK  | ISN-S8-0019   | 05, 12, 2018 |
| <input type="checkbox"/>            | CDN               | CDNS502A     | TESEQ        | 40431         | 01, 05, 2019 |

### Test Conditions

Temperature: 21,9 °C  
Relative Humidity: 41,8 % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

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

### Test Date

Dec. 27, 2017

### Test Location

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

### Test Equipment

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 04, 18, 2018 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 27, 2018 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 716           | 11, 28, 2018 |

### Test Conditions

Temperature: 21,6 °C  
Relative Humidity: 41,8 % R.H.

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

The requirements are:

☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

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

**Test Date**

Dec. 27, 2017

**Test Location**

SEMI ANECHOIC CHAMBER #3

**Test Equipment**

| Used                                | Description                | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|----------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W               | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER          | ESR7         | R & S            | 101190        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 05, 31, 2018 |
| <input type="checkbox"/>            | ATTENUATOR                 | 8491A        | HP               | 32173         | 03, 24, 2018 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 05, 02, 2019 |

**Test Conditions**Temperature: 21,4 °C  
Relative Humidity: 41,5 % R.H.**Frequency Range of Measurement**

1 GHz to 6 GHz

**Instrument Settings**

IF Band Width: 1 MHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

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



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## **APPENDIX A – TEST DATA**

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

HOT LINE

N/A

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### NEUTRAL LINE

N/A

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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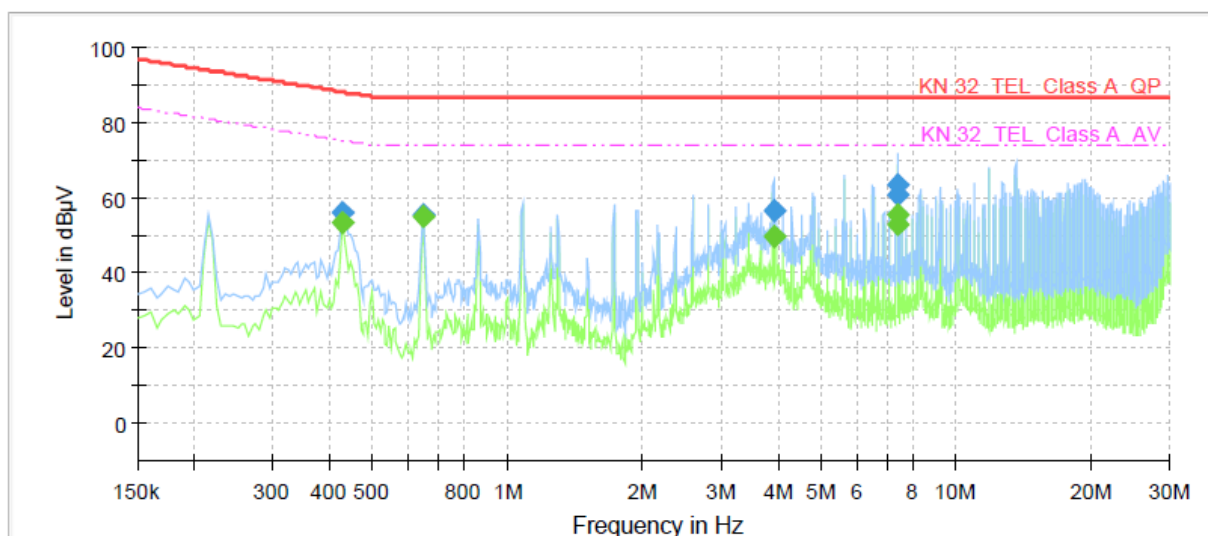
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## Conducted Emissions at Telecommunication Ports

[10 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Model No.: XNV-6022RP  
Mode: 10 Mbps  
Operator Name: KES



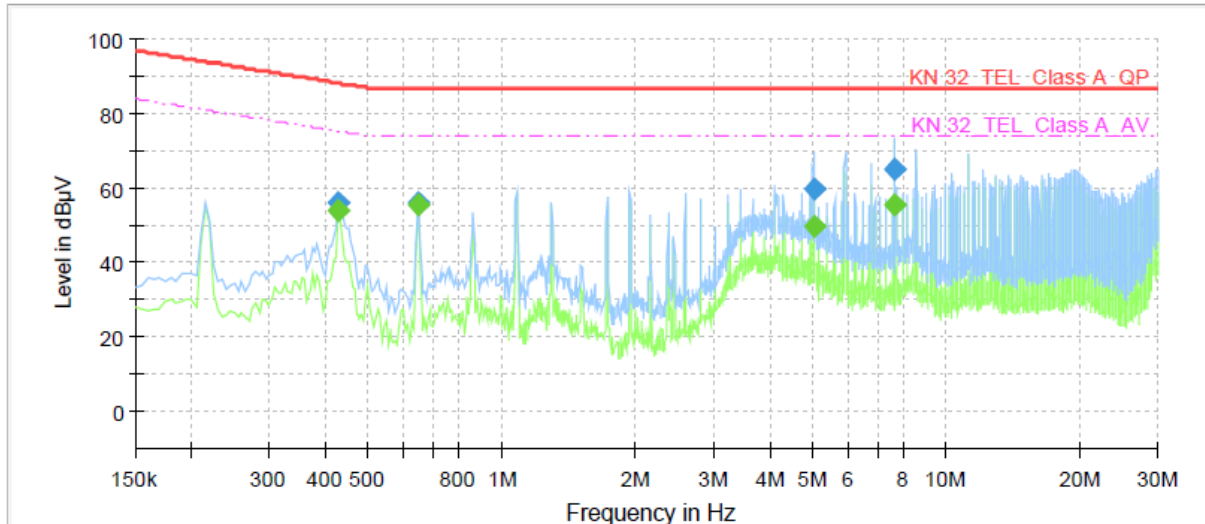
### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.430000        | ---              | 53.70           | 75.25        | 21.55       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.430000        | 55.96            | ---             | 88.25        | 32.29       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.645000        | ---              | 55.10           | 74.00        | 18.90       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.645000        | 55.38            | ---             | 87.00        | 31.62       | 1000.0          | 9.000           | Single Line | 19.7       |
| 3.915000        | ---              | 49.92           | 74.00        | 24.08       | 1000.0          | 9.000           | Single Line | 19.7       |
| 3.915000        | 56.42            | ---             | 87.00        | 30.58       | 1000.0          | 9.000           | Single Line | 19.7       |
| 7.390000        | ---              | 55.79           | 74.00        | 18.21       | 1000.0          | 9.000           | Single Line | 19.5       |
| 7.390000        | 63.60            | ---             | 87.00        | 23.40       | 1000.0          | 9.000           | Single Line | 19.5       |
| 7.395000        | ---              | 52.89           | 74.00        | 21.11       | 1000.0          | 9.000           | Single Line | 19.5       |
| 7.395000        | 60.86            | ---             | 87.00        | 26.14       | 1000.0          | 9.000           | Single Line | 19.5       |

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## [100 Mbps] Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNV-6022RP                 |
| Mode              | 100 Mbps                   |
| Operator Name:    | KES                        |



## Final Result

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.430000        | ---              | 54.10           | 75.25        | 21.15       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.430000        | 56.29            | ---             | 88.25        | 31.96       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.645000        | ---              | 55.68           | 74.00        | 18.32       | 1000.0          | 9.000           | Single Line | 20.0       |
| 0.645000        | 55.99            | ---             | 87.00        | 31.01       | 1000.0          | 9.000           | Single Line | 20.0       |
| 5.050000        | ---              | 49.50           | 74.00        | 24.50       | 1000.0          | 9.000           | Single Line | 19.8       |
| 5.050000        | 59.57            | ---             | 87.00        | 27.43       | 1000.0          | 9.000           | Single Line | 19.8       |
| 7.665000        | ---              | 55.83           | 74.00        | 18.17       | 1000.0          | 9.000           | Single Line | 19.8       |
| 7.665000        | 65.02            | ---             | 87.00        | 21.98       | 1000.0          | 9.000           | Single Line | 19.8       |

### ◆ Calculation

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

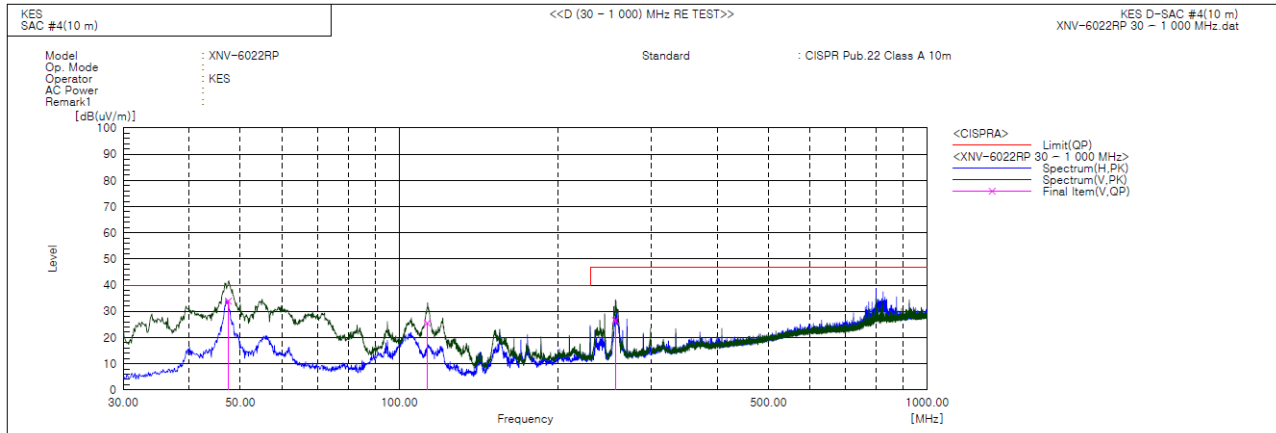
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



## Radiated Electric Field Emissions(Below 1 GHz)



### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 47.456          | V   | 61.8                | -27.9         | 33.9                 | 40.0                | 6.1            | 183.0       | 321.0       |        |
| 2   | 113.036         | V   | 55.3                | -29.8         | 25.5                 | 40.0                | 14.5           | 100.0       | 294.0       |        |
| 3   | 256.638         | V   | 51.6                | -25.1         | 26.5                 | 47.0                | 20.5           | 121.0       | 83.0        |        |

### ◆ Calculation

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

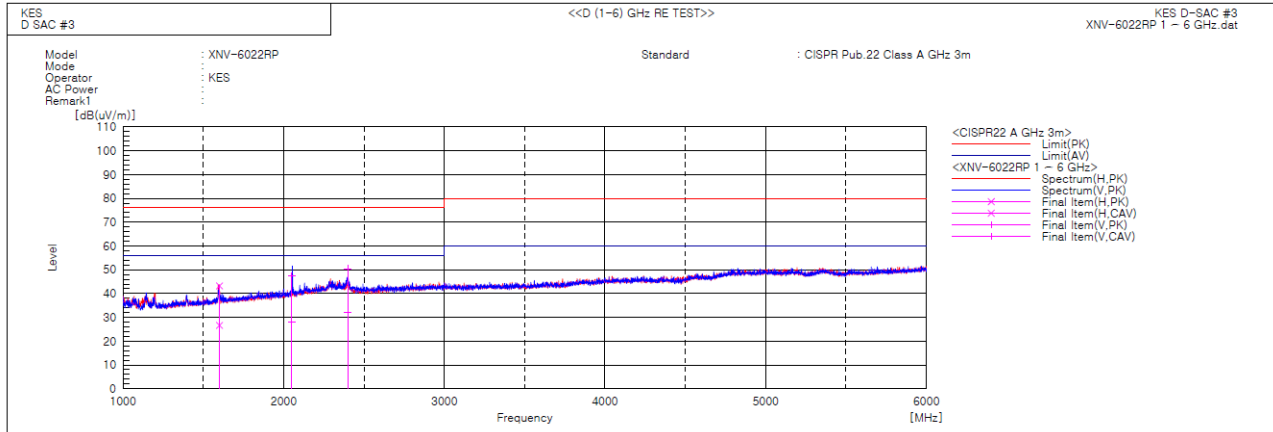
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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

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



## Radiated Electric Field Emissions(Above 1 GHz)



### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1   | 1600.560        | H   | 48.4                | 31.9                 | -5.2          | 43.2                 | 26.7                  | 76.0                | 56.0                | 32.8           | 29.3            | 100.0       | 293.5       |        |
| 2   | 2049.431        | V   | 48.8                | 29.4                 | -1.4          | 47.4                 | 28.0                  | 76.0                | 56.0                | 28.6           | 28.0            | 100.0       | 317.7       |        |
| 3   | 2398.331        | V   | 50.2                | 31.8                 | 0.2           | 50.4                 | 32.0                  | 76.0                | 56.0                | 25.6           | 24.0            | 100.0       | 269.9       |        |

### ◆ Calculation

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

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

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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



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## Test Setup Photos and Configuration

### Conducted Voltage Emissions

N/A

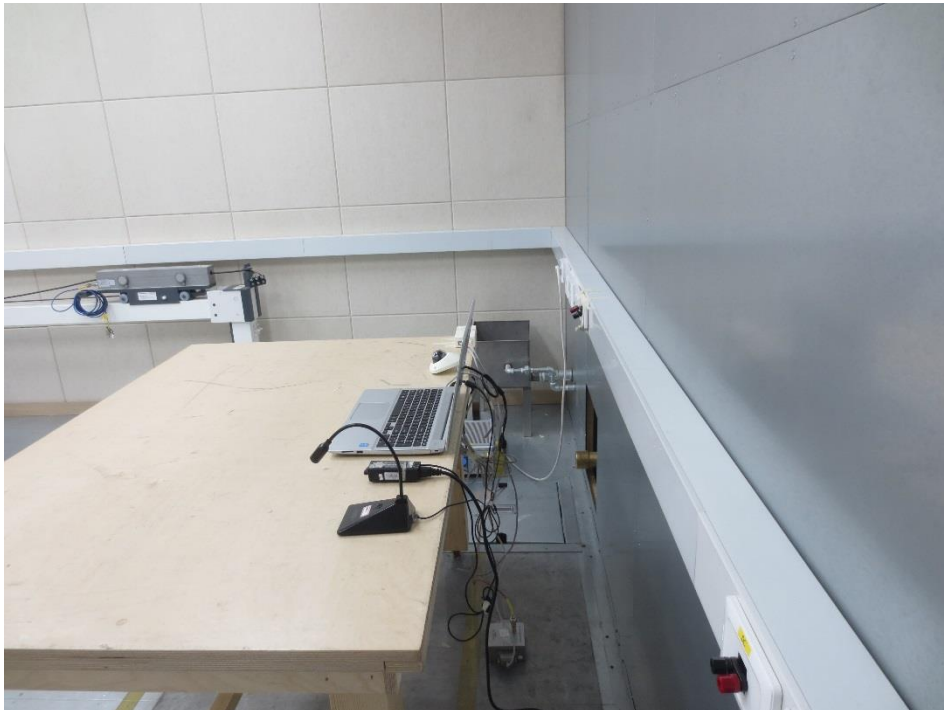
N/A

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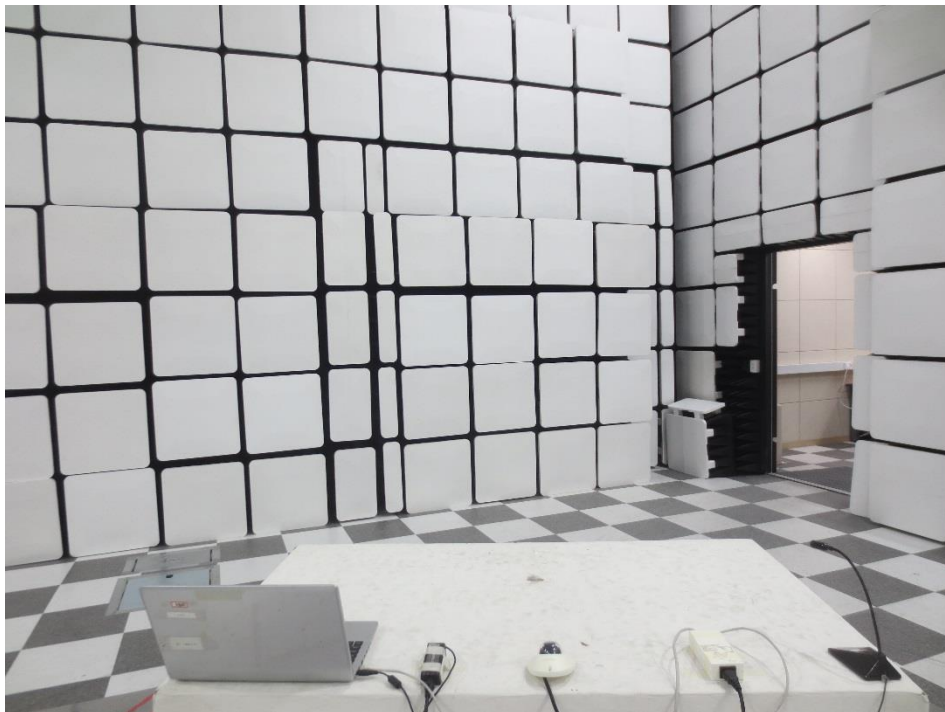
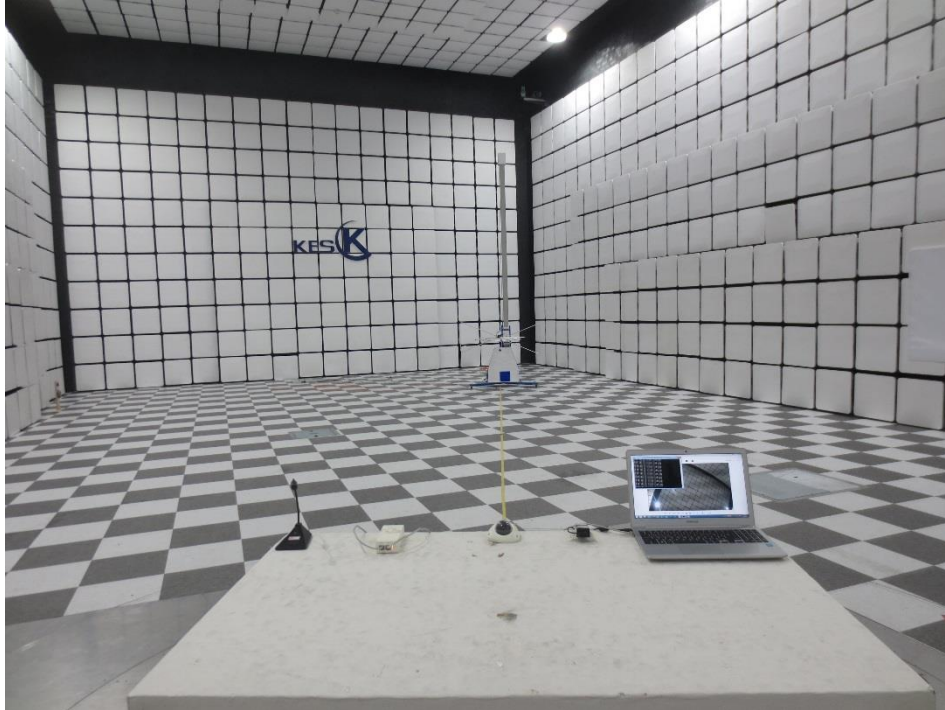
## Conducted Telecommunication Emissions



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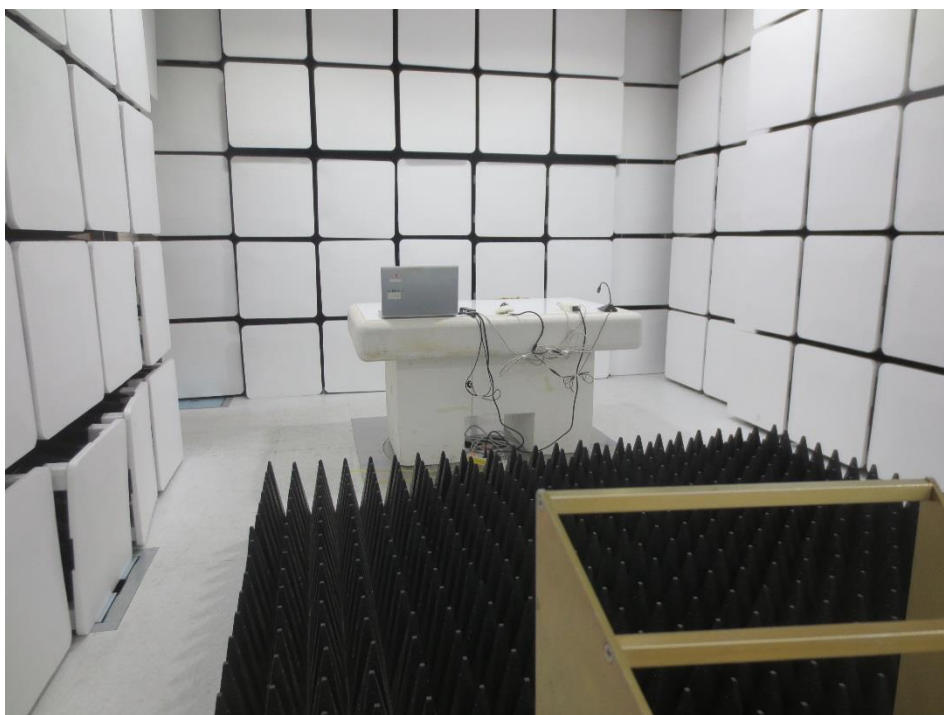
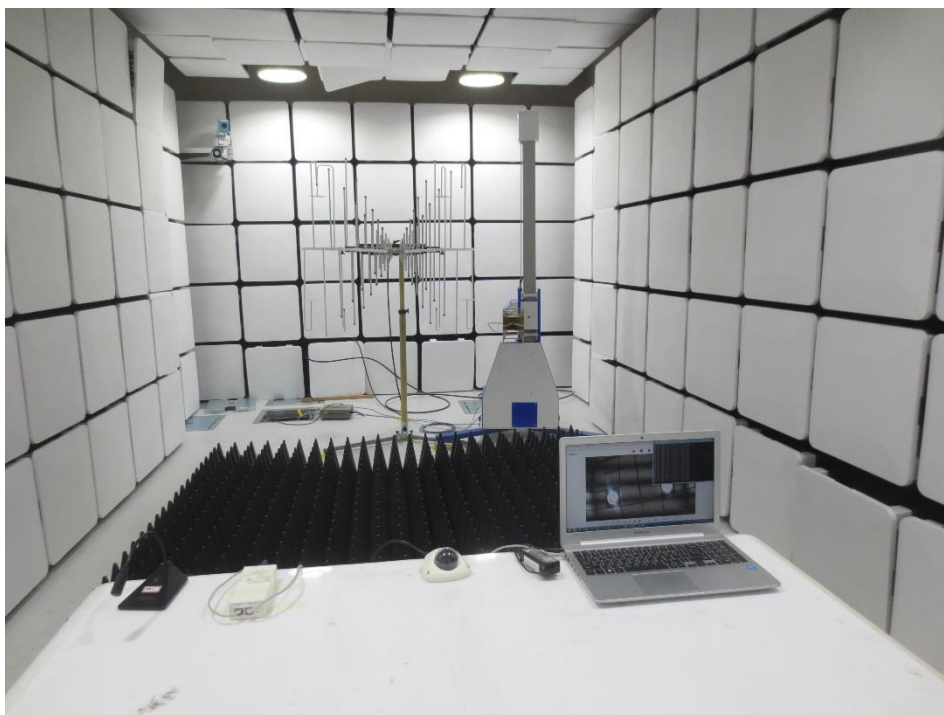
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## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Main board

(Top)



(Bottom)



## EUT Internal View – LED board

(Top)



(Bottom)



## EUT Internal View – Lens board

(Top)



(Bottom)

