

# EMC TEST REPORT For VCCI

Test Report No. : KES-E1-18T0052  
Date of Issue : Jan. 09, 2018  
Product name : Network Camera  
Model/Type No. : XNV-6013MN  
Variant Model : -  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,  
Gyeongsangnam-do, Korea  
Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.  
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial  
Park, TEDA, Tianjin, 300385, People's Republic of China.

Equipment authorization :  Declaration of Conformity  
 Verification  
 Certification

Date of Receipt : Dec. 21, 2017  
Test date : Jan. 03, 2018 ~ Jan. 04, 2018  
Test Results :  In Compliance  Not in Compliance

Tested by



Tae Yeon, Kim  
EMC Test Engineer

Reviewed by



Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KOLAS.

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**REPORT REVISION HISTORY**

| <b>Date</b>   | <b>Test Report No.</b> | <b>Revision History</b> |
|---------------|------------------------|-------------------------|
| Jan. 09, 2018 | KES-E1-18T0052         | Issued                  |
|               |                        |                         |
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|               |                        |                         |
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|               |                        |                         |

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## 1.0 General Product Description

Main Specifications of EUT are:

|                                  |  |
|----------------------------------|--|
| <b>Video</b>                     |  |
| <b>Imaging Device</b>            | <b>1/2.8" 2M CMOS</b>  |
| <b>Total Pixels</b>              | <b>1945(H) x 1109(V) 2.16M</b>   |
| <b>Effective Pixels</b>          | <b>1945(H) x 1097(V) 2.13M</b>   |
| <b>Scanning System</b>           | <b>Progressive Scan</b>  |
| <b>Min. Illumination</b>         | <b>Color : 0.055 lux(F2.0, 1/30sec) (TBD)<br/>B/W : 0Lux(IR LED On)</b>  |
| <b>S / N Ratio</b>               | <b>50dB</b>  |
| <b>Video Out</b>                 | <b>USB : Micro USB type B, 1280x720, for installation</b>  |
| <b>Lens</b>                      |  |
| <b>Focal Length (Zoom Ratio)</b> | <b>3.6mm Fixed</b>   |
| <b>Max. Aperture Ratio</b>       | <b>F2.0</b>  |
| <b>Angular Field of View</b>     | <b>H 96.4° V 50.5° D 116° (TBD)</b>  |
| <b>Min. Object Distance</b>      | <b>TBD</b>   |
| <b>Focus Control</b>             | <b>Manual</b>  |
| <b>Lens Type</b>                 | <b>Fixed</b>   |
| <b>Mount Type</b>                | <b>Board-in type</b>   |
| <b>Pan / Tilt / Rotate</b>       |  |
| <b>Pan / Tilt / Rotate range</b> | <b>±5°/0-67°/±90°</b>  |
| <b>Operational</b>               |  |
| <b>IR Viewable Length</b>        | <b>15m(49.21ft)</b>  |
| <b>Camera Title</b>              | <b>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</b> |
| <b>Day &amp; Night</b>           | <b>Auto (ICR) / Color / B/W / External / Schedule</b>  |
| <b>Backlight Compensation</b>    | <b>Off / BLC / HLC(Masking/Dimming), WDR</b>   |
| <b>Wide Dynamic Range</b>        | <b>150dB</b>   |
| <b>Contrast</b>                  | <b>SSDR (Off / On)</b>   |

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|                                    |  |
|------------------------------------|--|
| <b>Enhancement</b>                 |  |
| <b>Digital Noise Reduction</b>     | <b>SSNR5 (2D+3D Noise Filter) (Off / On)</b>   |
| <b>Digital Image Stabilization</b> | <b>Off / On</b>  |
| <b>Defog</b>                       | <b>Auto(input from fog detection) / Manual / Off</b>   |
| <b>Motion Detection</b>            | <b>Off/ On(8ea, 8point Polygonal zones), Handover</b>  |
| <b>Privacy Masking</b>             | <b>Off / On (32ea, polygonal zones)<br/>- Color : Grey/Green/Red/Blue/Black/White<br/>- Mosaic</b>   |
| <b>Gain Control</b>                | <b>Off / Low / Middle / High</b>   |
| <b>White Balance</b>               | <b>ATW / AWC / Manual / Indoor / Outdoor((included Mercury &amp; Sodium))</b>  |
| <b>Contrast</b>                    | <b>level adjustment</b>  |
| <b>LDC</b>                         | <b>On/Off (5 levels with Min/Max)</b>  |
| <b>Electronic Shutter Speed</b>    | <b>Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)</b>  |
| <b>Digital PTZ</b>                 | <b>24X, 'Digital PTZ(Preset, Group)</b>  |
| <b>Flip / Mirror</b>               | <b>Flip : On/Off<br/>Mirror : On/Off<br/>Hallway view : 90°/270°</b>   |
| <b>Video &amp; Audio Analytics</b> | <b>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</b> |
| <b>Alarm I/O</b>                   | <b>-</b>   |
| <b>Alarm Triggers</b>              | <b>Motion Detection, Video &amp; Audio Analytics, Network Disconnect</b>   |
| <b>Alarm events</b>                | <b>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</b>  |
| <b>Audio In</b>                    | <b>Selectable (Mic IN/Line IN), Built-in microphone<br/>Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm</b>   |
| <b>Audio out</b>                   | <b>Line out, Max output level: 1 Vrms</b>  |

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|                                 |   |
|---------------------------------|---|
| <b>Audio Noise Reduction</b>    | <b>Off / On</b>   |
| <b>Pixel Counter</b>            | <b>Support</b>  |
| <b>Network</b>                  |   |
| <b>Ethernet</b>                 | <b>M12 (10/100BASE-T)</b>   |
| <b>Video Compression Format</b> | <b>H.265/H.264 (MPEG-4 Part 10/AVC) :<br/>Main/Baseline/High , Motion JPEG</b>  |
| <b>Resolution</b>               | <b>1920x1080, 1280x1024, 1280x960, 1280x720,<br/>1024x768, 800x600, 800x448, 720x576, 720x480,<br/>640x480, 640x360, 320x240</b>  |
| <b>Max. Framerate</b>           | <b>H.265/H.264 : Max. 60fps at all resolutions<br/>Motion JPEG : Max. 30fps</b>   |
| <b>Smart Codec</b>              | <b>Manual Mode (area-based : 5EA)</b>   |
| <b>WiseStream II</b>            | <b>Support</b>  |
| <b>Video Quality Adjustment</b> | <b>H.264/H.265 : Target Bitrate Level Control<br/>MJPEG : Target Bitrate Level Control</b>  |
| <b>Bitrate Control Method</b>   | <b>H.264/H.265 : CBR or VBR<br/>MJPEG : VBR</b>   |
| <b>Streaming Capability</b>     | <b>Multiple Streaming (Up to 10 Profiles)</b>   |
| <b>Audio Compression Format</b> | <b>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</b>   |
| <b>Audio Communication</b>      | <b>Bi-dierctional (2-Way)</b>   |
| <b>IP</b>                       | <b>IPv4, IPv6</b>   |
| <b>Protocol</b>                 | <b>TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP,<br/>NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP,<br/>SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP,<br/>DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour</b> |
| <b>Security</b>                 | <b>HTTPS(SSL) Login Authentication<br/>Digest Login Authentication<br/>IP Address Filtering<br/>User access Log<br/>802.1X Authentication (EAP-TLS, EAP-LEAP)</b>                                 |
| <b>Streaming Method</b>         | <b>Unicast / Multicast</b>  |
| <b>Max. User Access</b>         | <b>20 users at Unicast Mode</b>   |

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|  |  |
|--|--|
| <b>Edge Storage</b>                      | <b>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</b>   |
| <b>Application Programming Interface</b> | <b>ONVIF Profile S/G<br/>     SUNAPI(HTTP API)<br/>     Open Platform</b>  |
| <b>Webpage Language</b>                  | <b>English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek</b>  |
| <b>Web Viewer</b>                        | <b>Supported OS: Windows 7, 8.1, 10, Mac OS X 10.10.10.11 10.12<br/>     Non-plugin Webviewer<br/>     Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49(Window 64bit only) , Apple Safari 9 (Mac OS X only)<br/>     Plug-in Webviewer<br/>     Supported Browser : MS Explore 11, Apple Safari 9 (Mac OS X only)</b> |
| <b>Central Management Software</b>       | <b>SmartViewer, SSM</b>  |
| <b>Environmental</b>                     |  |
| <b>Operating Temperature / Humidity</b>  | <b>-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH<br/>     *Start up should be done at above -20°C</b>  |
| <b>Storage Temperature / Humidity</b>    | <b>-50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH</b>   |
| <b>Ingress Protection</b>                | <b>IP66</b>  |
| <b>Vibration Resistance</b>              | <b>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</b>  |
| <b>Vandal Resistance</b>                 | <b>IK10, NEMA4X</b>  |
| <b>Electrical</b>                        |  |
| <b>Input Voltage / Current</b>           | <b>PoE(IEEE802.3af,Class3)</b>   |
| <b>Power Consumption</b>                 | <b>TBD</b>   |
| <b>Mechanical</b>                        |  |
| <b>Color / Material</b>                  | <b>Ivory / Metal</b>   |

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|                          |                      |
|--------------------------|----------------------|
| <b>Dimension (WxHxD)</b> | <b>99 x 52 x 100</b> |
| <b>Weight</b>            | <b>296g(TBD)</b>     |

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## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage       230 Vac    100 Vac    24 Vac    5 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-6013MN   | -             | Hanwha Techwin (Tianjin) Co.,Ltd. | E.U.T   |

## 1.5 Support Equipments

| Description   | Model Number | Serial Number     | Manufacturer                            | Remarks |
|---------------|--------------|-------------------|---|---------|
| PoE Injector  | RP-PEG048I   | 1308AZ110162      | REPOTEC                                 | -       |
| MIC           | CMK-303      | -                 | CAMAC                                   | -       |
| Earphone      | MDR-Q38      | -                 | SONY                                    | -       |
| Smart Phone   | SHV-E210L    | R33C71BE64F       | SAMSUNG                                 | -       |
| Notebook      | X56K         | HN11N5151FJ0045W  | Hansung computer co., Ltd.              | -       |
| AC/DC Adaptor | PA-1900-14   | OF91R633487012228 | LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD. | -       |

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## 1.6 External I/O Cabling

| Start                |          | END          |          | Cable Spec. |        |
|----------------------|----------|--------------|----------|-------------|--------|
| Description          | I/O Port | Description  | I/O Port | Length      | Shield |
| Network Camera (EUT) | RJ-45    | PoE Injector | RJ-45    | 3.00        | U      |
|                      | 3.5 mm   | MIC          | 3.5 mm   | 1.55        | U      |
|                      | 3.5 mm   | Earphone     | 3.5 mm   | 1.00        | U      |
| PoE Injector         | RJ-45    | Notebook     | RJ-45    | 1.00        | U      |
| Smart Phone          | 3.5 mm   | Notebook     | 3.5 mm   | 1.00        | U      |

\* Unshielded=U, Shielded=S

## 1.7 EUT Operating Mode(s)

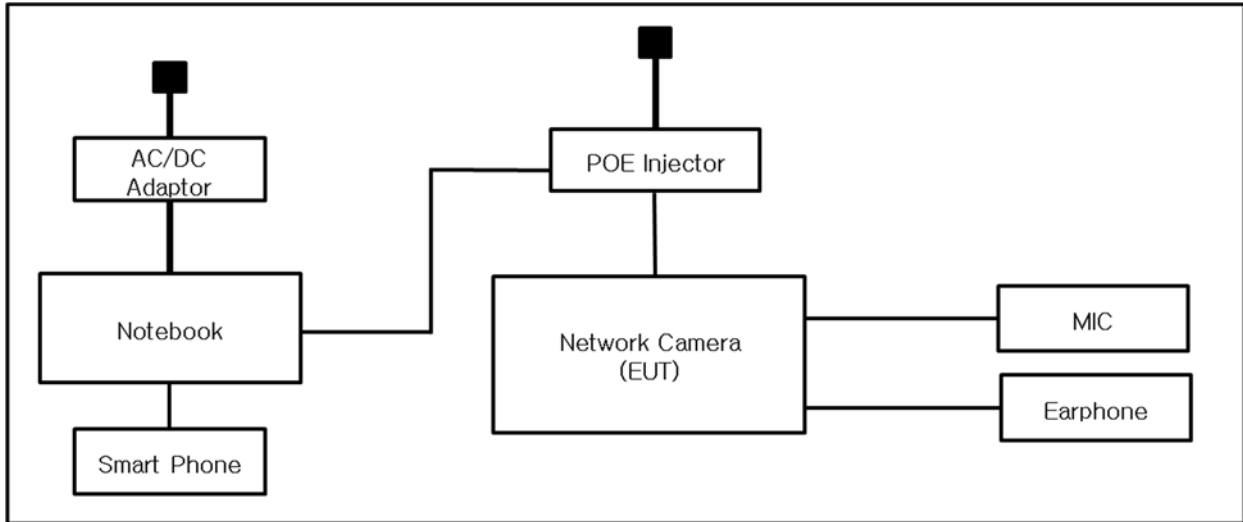
| Test mode | operating   |
|-----------|---|
| PoE       | E.U.T Monitoring, Ping Test<br>1 kHz sound tone input and output confirmation |

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

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## 1.8 Configuration

■ AC Main  
□ DC Main



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## 1.9 Remarks when standards applied

N/A





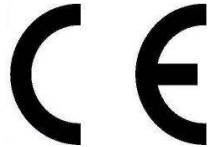

## 1.10 Calibration Details of Equipment Used for Measurement

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. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32.

## 1.12 Laboratory Accreditations and Listings

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

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## 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 55032:2015

Class A

Class B

EN 55024:2010 +A1:2015

EN 50130-4:2011 +A1:2014

EN 61000-3-2:2014

EN 61000-3-3:2013

EN 61326-1:2013



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

## 2.1 Conducted Emissions 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

Jan. 03, 2018

### 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: 23,1 °C  
Relative Humidity: 40,9 % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

### Remarks

See Appendix A for test data.





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

### Test Date

Jan. 04, 2018

### Test Location

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

### Test Equipment

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 04, 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: 23,8 °C  
Relative Humidity: 41,7 % 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**

Jan. 04, 2018

**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: 22,8 °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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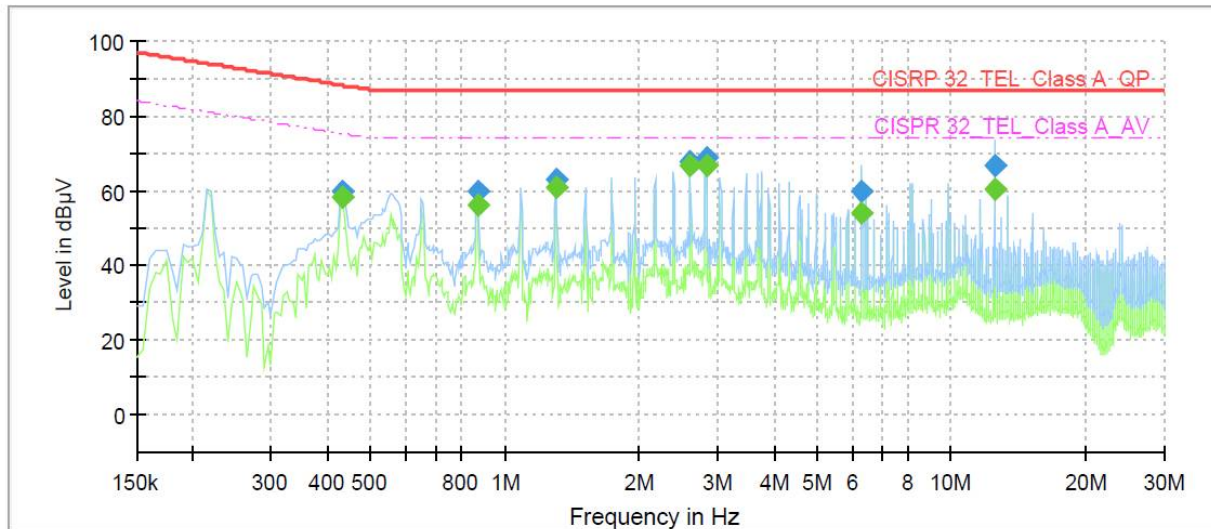
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## Conducted Emissions at Telecommunication Ports

[10 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNV-6013MN                 |
| Mode              | 10 Mbps                    |
| Operator Name:    | KES                        |



### Final Result

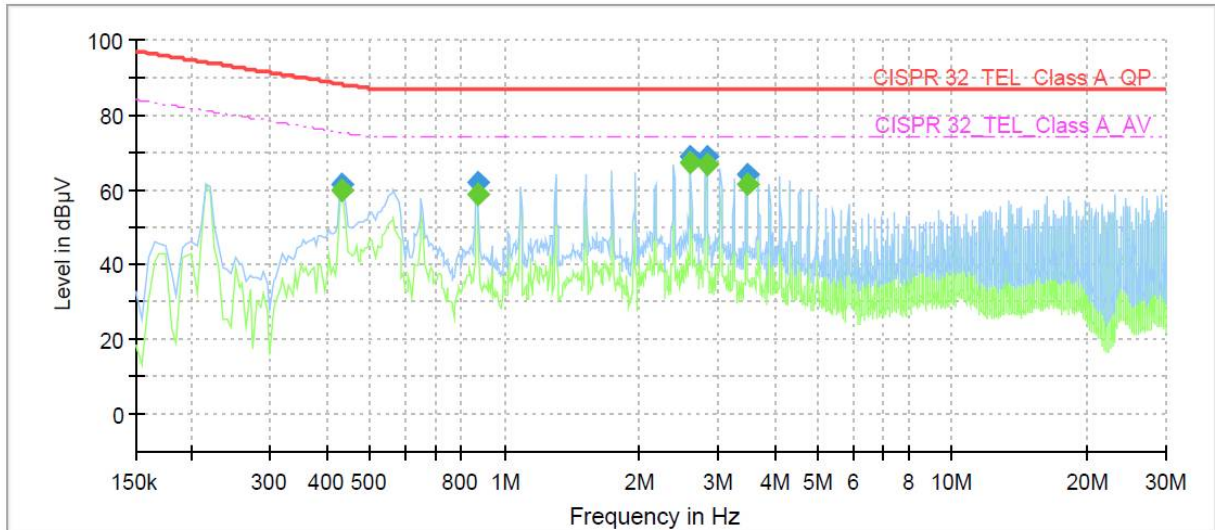
| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.435000        | ---              | 58.24           | 75.16        | 16.92       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.435000        | 59.83            | ---             | 88.16        | 28.33       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.870000        | ---              | 56.18           | 74.00        | 17.82       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.870000        | 59.90            | ---             | 87.00        | 27.10       | 1000.0          | 9.000           | Single Line | 19.9       |
| 1.300000        | ---              | 60.99           | 74.00        | 13.01       | 1000.0          | 9.000           | Single Line | 20.0       |
| 1.300000        | 62.83            | ---             | 87.00        | 24.17       | 1000.0          | 9.000           | Single Line | 20.0       |
| 2.605000        | ---              | 66.53           | 74.00        | 7.47        | 1000.0          | 9.000           | Single Line | 19.9       |
| 2.605000        | 67.62            | ---             | 87.00        | 19.38       | 1000.0          | 9.000           | Single Line | 19.9       |
| 2.820000        | ---              | 66.47           | 74.00        | 7.53        | 1000.0          | 9.000           | Single Line | 19.9       |
| 2.820000        | 68.93            | ---             | 87.00        | 18.07       | 1000.0          | 9.000           | Single Line | 19.9       |
| 6.305000        | ---              | 53.74           | 74.00        | 20.26       | 1000.0          | 9.000           | Single Line | 19.4       |
| 6.305000        | 59.78            | ---             | 87.00        | 27.22       | 1000.0          | 9.000           | Single Line | 19.4       |
| 12.500000       | ---              | 60.16           | 74.00        | 13.84       | 1000.0          | 9.000           | Single Line | 19.9       |
| 12.500000       | 66.89            | ---             | 87.00        | 20.11       | 1000.0          | 9.000           | Single Line | 19.9       |

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**[100 Mbps]**

**Common Information**

Test Description: Telecommunication Emission  
 Model No.: XNV-6013MN  
 Mode: 100 Mbps  
 Operator Name: KES



**Final Result**

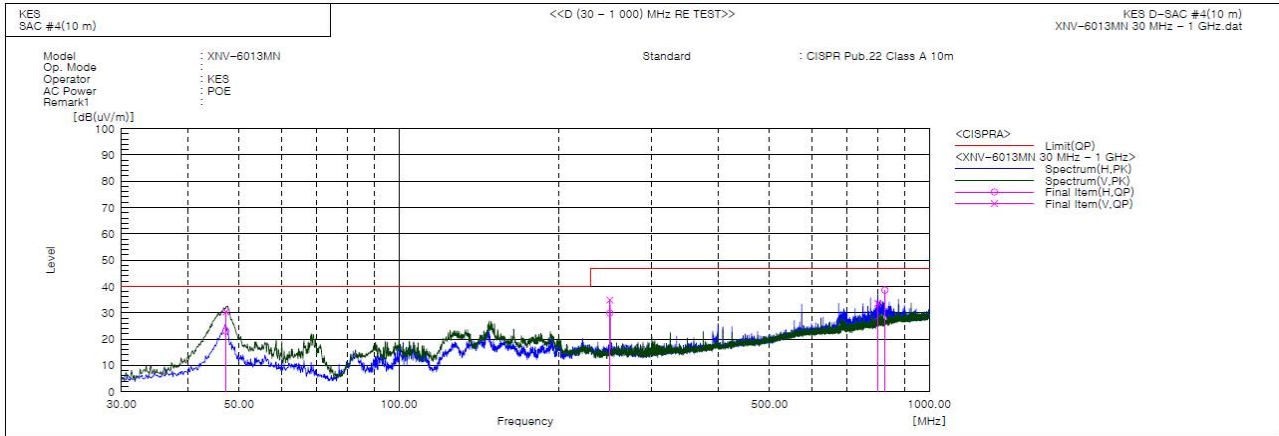
| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.435000        | ---              | 59.93           | 75.16        | 15.23       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.435000        | 61.23            | ---             | 88.16        | 26.93       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.870000        | ---              | 58.96           | 74.00        | 15.04       | 1000.0          | 9.000           | Single Line | 20.2       |
| 0.870000        | 61.93            | ---             | 87.00        | 25.07       | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.605000        | ---              | 67.16           | 74.00        | 6.84        | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.605000        | 69.01            | ---             | 87.00        | 17.99       | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.820000        | ---              | 66.62           | 74.00        | 7.38        | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.820000        | 68.81            | ---             | 87.00        | 18.19       | 1000.0          | 9.000           | Single Line | 20.2       |
| 3.470000        | ---              | 61.50           | 74.00        | 12.50       | 1000.0          | 9.000           | Single Line | 20.1       |
| 3.470000        | 63.83            | ---             | 87.00        | 23.17       | 1000.0          | 9.000           | Single Line | 20.1       |

◆ 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 + 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   | 47.190          | H   | 51.0                | -28.0         | 23.0                 | 40.0                | 17.0           | 394.0       | 173.0       |        |
| 2   | 47.267          | V   | 58.3                | -28.0         | 30.3                 | 40.0                | 9.7            | 186.0       | 208.0       |        |
| 3   | 249.992         | H   | 55.3                | -25.4         | 29.9                 | 47.0                | 17.1           | 400.0       | 307.0       |        |
| 4   | 250.000         | V   | 60.2                | -25.4         | 34.8                 | 47.0                | 12.2           | 100.0       | 177.0       |        |
| 5   | 800.016         | V   | 46.0                | -12.5         | 33.5                 | 47.0                | 13.5           | 354.0       | 208.0       |        |
| 6   | 825.011         | H   | 50.2                | -11.6         | 38.6                 | 47.0                | 8.4            | 100.0       | 249.0       |        |

### ◆ Calculation

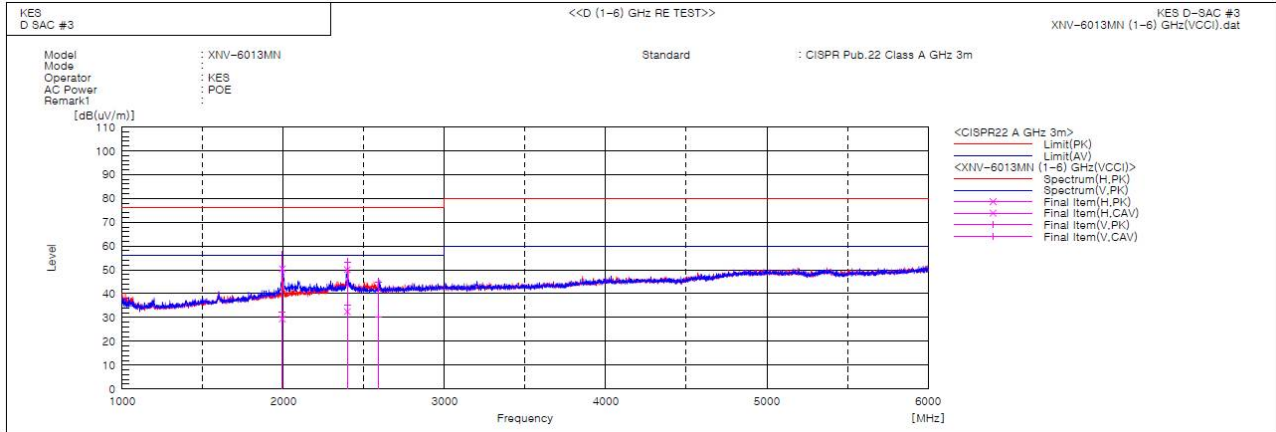
Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss



## Radiated Electric Field Emissions(Above 1 GHz)



### 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   | 1993.120        | H   | 52.2                | 31.1                 | -1.7          | 50.5                 | 29.4                  | 76.0                | 56.0                | 25.5           | 26.6            | 100.0       | 272.2       |        |
| 2   | 1991.841        | V   | 58.0                | 34.1                 | -1.7          | 56.3                 | 32.4                  | 76.0                | 56.0                | 19.7           | 23.6            | 100.0       | 7.8         |        |
| 3   | 2399.789        | V   | 53.1                | 35.0                 | 0.2           | 53.3                 | 35.2                  | 76.0                | 56.0                | 22.7           | 20.8            | 100.0       | 53.9        |        |
| 4   | 2396.921        | H   | 49.8                | 32.2                 | 0.2           | 50.0                 | 32.4                  | 76.0                | 56.0                | 26.0           | 23.6            | 100.0       | 166.0       |        |
| 5   | 2591.060        | V   | 44.0                | 29.1                 | 0.9           | 44.9                 | 30.0                  | 76.0                | 56.0                | 31.1           | 26.0            | 100.0       | 184.0       |        |

### ◆ Calculation

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

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

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

Limit(PK/CAV) : 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**

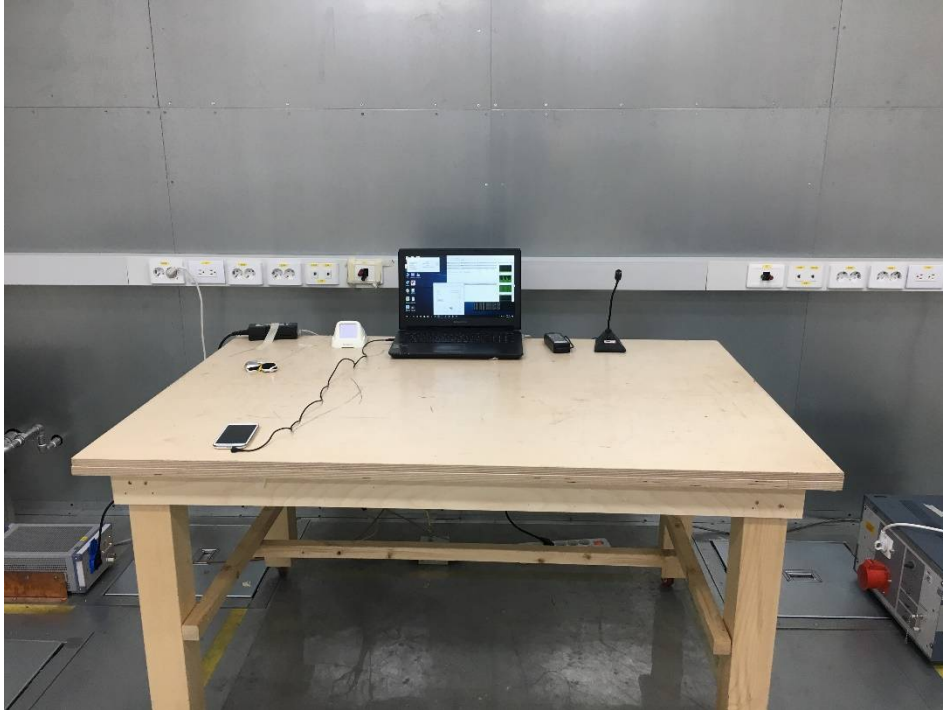
N/A

N/A

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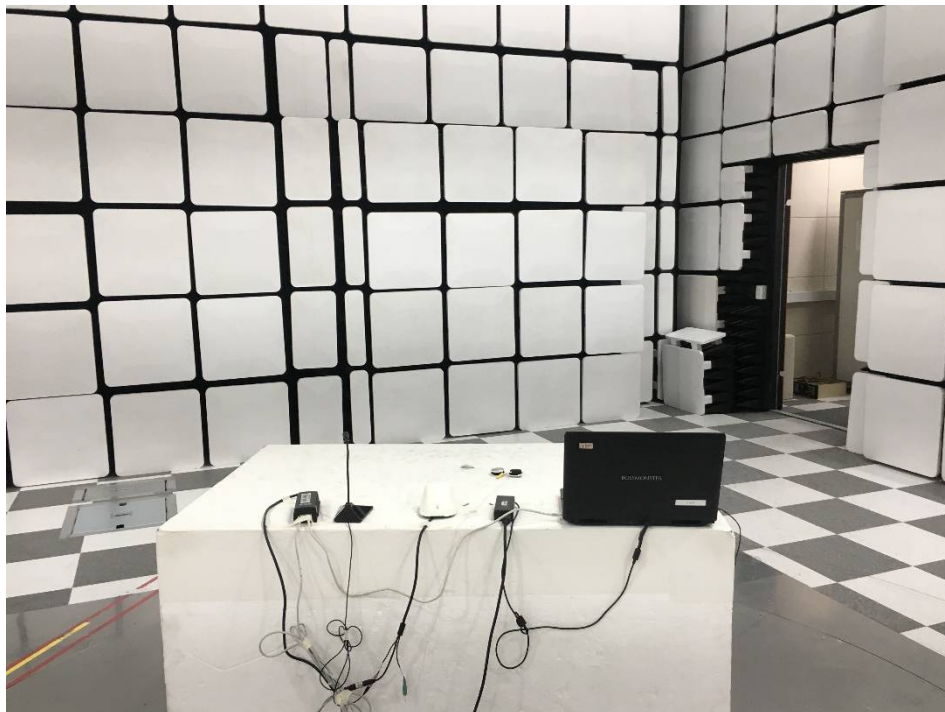
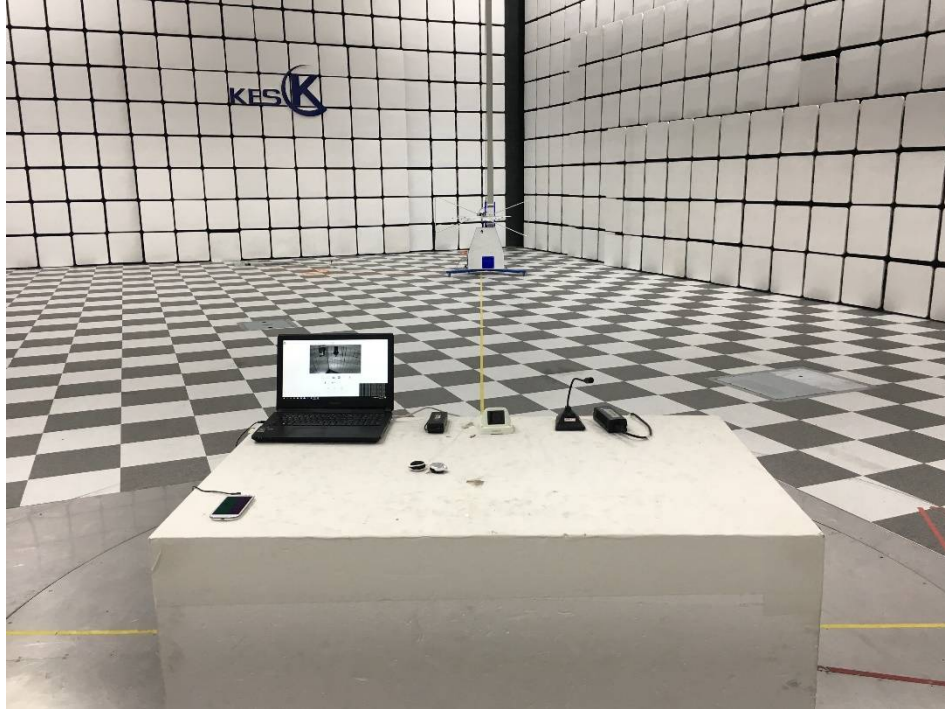
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## Conducted Telecommunication Emissions



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## adiated 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)

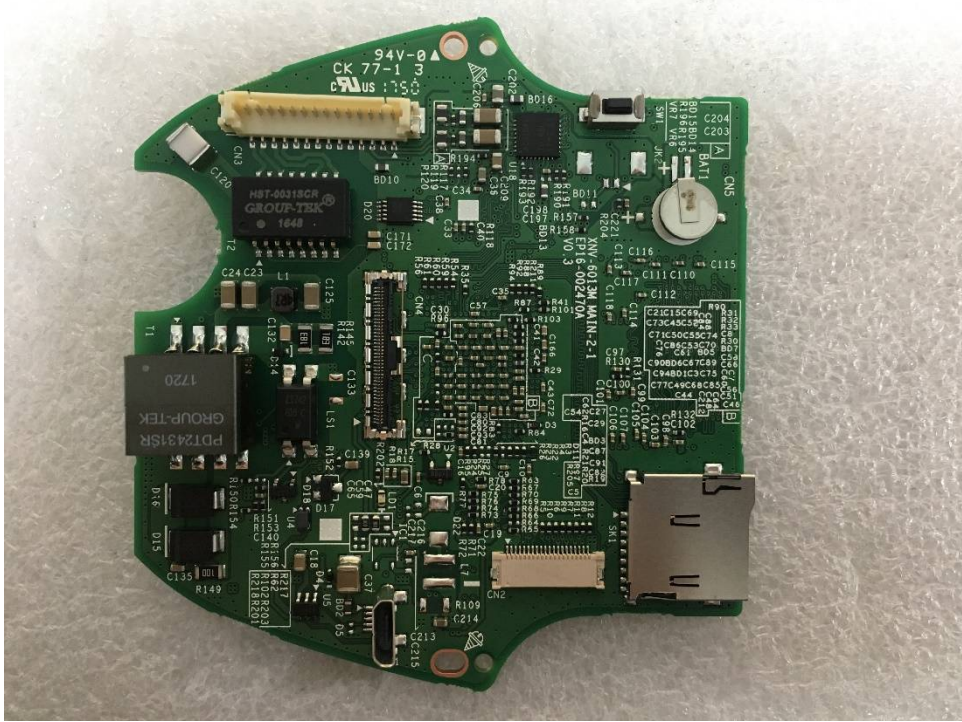


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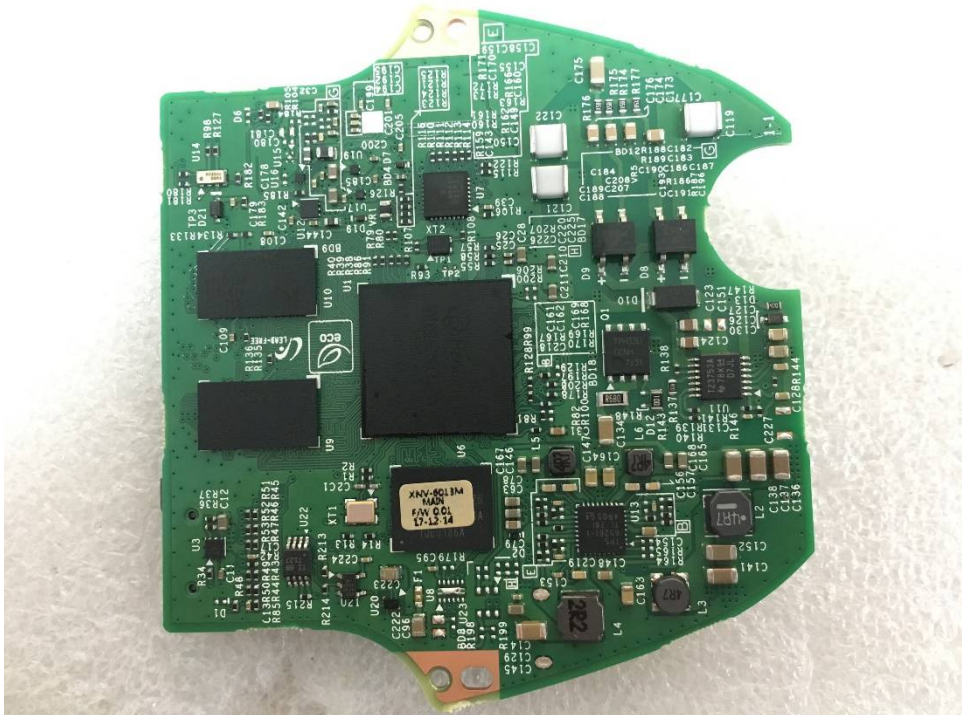


## EUT Internal View – Main board

(Top)



(Bottom)



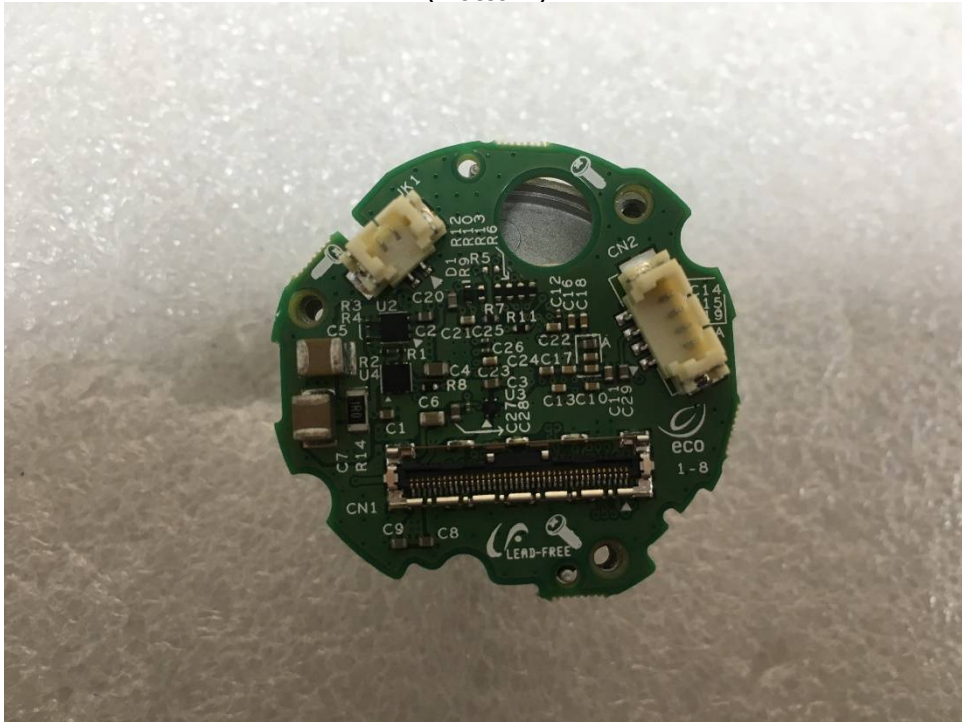
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## EUT Internal View – Sensor board

(Top)



(Bottom)



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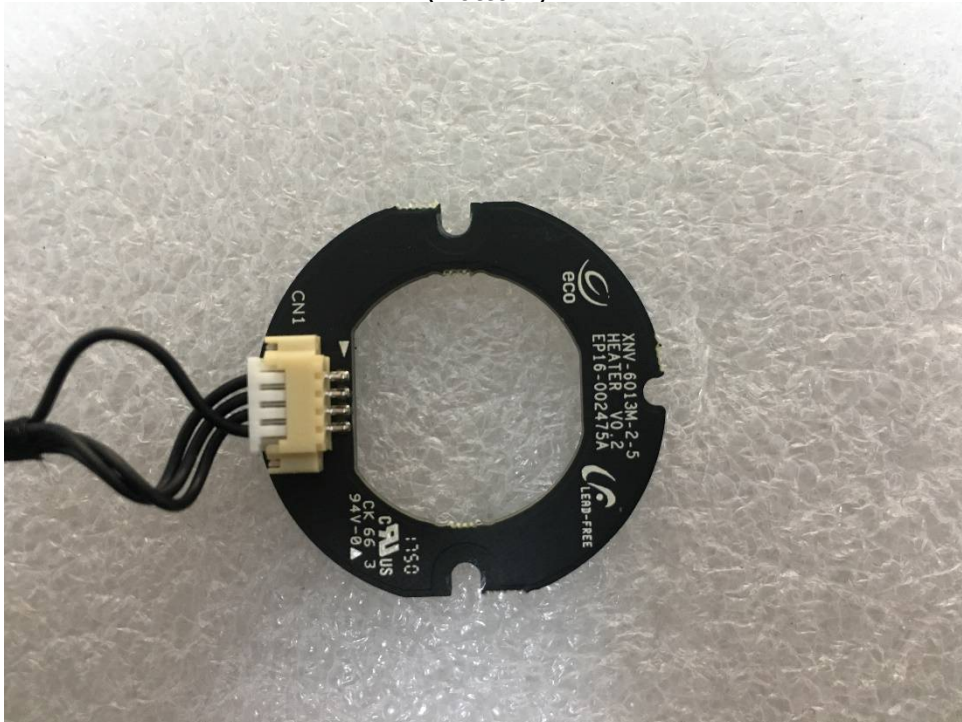


## EUT Internal View – HEATER

(Top)



(Bottom)



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## EUT Internal View – Lens

(Top)



(Bottom)



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