



## EMC TEST REPORT For VCCI

Test Report No. : KES-EM-21T0300-R1  
Date of Issue : Feb. 24, 2023  
Product name : NETWORK CAMERA  
Model/Type No. : XNV-C8083R  
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 : Mar. 31, 2021  
Test date : Apr. 07, 2021 ~ Apr. 08, 2021  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

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

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**REPORT REVISION HISTORY**

| Date          | Test Report No.   | Revision History                                                     |
|---------------|-------------------|----------------------------------------------------------------------|
| Apr. 29, 2021 | KES-EM-21T0300    | Issued                                                               |
| Feb. 24, 2023 | KES-EM-21T0300-R1 | Change the Applicant and manufacturer at the request of the customer |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |

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## 1.0 General Product Description

### Main Specifications of EUT are:

|                             |                                                                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imaging Device              | 1/1.8" progressive CMOS                                                                                                                                                  |
| Resolution                  | 3328x1872, 3072x1728, 2592x1944, 2688x1520, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240 |
| Max. Framerate              | H.265/H.264: Max. 30fps/25fps(60Hz/50Hz)<br>MJPEG: Max. 15fps/12fps(60Hz/50Hz)                                                                                           |
| NETD                        | None                                                                                                                                                                     |
| Pixel Size                  | None                                                                                                                                                                     |
| Min. Illumination           | Color: 0.04Lux(F1.3, 1/30sec, 30IRE)<br>B/W : 0.004Lux(F1.3, 1/30sec, 30IRE), 0Lux(IR LED on)                                                                            |
| Video Out                   | USB: Micro USB Type B, 1280x720 for installation                                                                                                                         |
| Video Transmission Distance | None                                                                                                                                                                     |
| <b>Lens</b>                 |                                                                                                                                                                          |
| Focal Length (Zoom Ratio)   | 4.4~9.3mm(2.1x) motorized varifocal                                                                                                                                      |
| Max. Aperture Ratio         | F1.3                                                                                                                                                                     |
| Angular Field of View       | H : 112.1°(Wide)~47.5°(Tele)<br>V : 58.0°(Wide)~26.6°(Tele)<br>D : 137.5°(Wide)~54.6°(Tele)                                                                              |
| Min. Object Distance        | 0.5m(1.64ft)                                                                                                                                                             |
| Focus Control               | Simple focus, Manual                                                                                                                                                     |
| Lens Type                   | P-iris(IR corrected)                                                                                                                                                     |
| Mount Type                  | None                                                                                                                                                                     |
| Optional Lens               | None                                                                                                                                                                     |

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| Pan / Tilt / Rotate         |                                                                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Pan / Tilt / Rotate Range   | TBD (Pan $\pm$ 177 isang, Tilt $\pm$ 75 isang, Rotate $\pm$ 178 isang)<br>* gijon WN5 X sayang (0° ~ 354° / 0° ~ 67° / 0° ~ 355°) |
| Pan Range                   | None                                                                                                                              |
| Pan Speed                   | None                                                                                                                              |
| Tilt Range                  | None                                                                                                                              |
| Tilt Speed                  | None                                                                                                                              |
| Rotate Range                | None                                                                                                                              |
| Sequence                    | None                                                                                                                              |
| Preset Accuracy             | None                                                                                                                              |
| Operational                 |                                                                                                                                   |
| Camera Title                | Displayed up to 85 characters                                                                                                     |
| Direction Indicator         | None                                                                                                                              |
| Day & Night                 | Auto(ICR)                                                                                                                         |
| Backlight Compensation      | BLC, HLC, WDR, SSDR                                                                                                               |
| Wide Dynamic Range          | extremeWDR (120dB)                                                                                                                |
| Digital Noise Reduction     | WiseNR II (Based on AI engine), SSNR V                                                                                            |
| Digital Image Stabilization | Support(built-in gyro sensor)                                                                                                     |
| Defog                       | Support                                                                                                                           |
| Motion Detection            | 8ea, 8point Polygonal zones                                                                                                       |
| Privacy Masking             | 32ea, 4point Quadrangle zones<br>- Color : Gray, Green, Red, Blue, Black, White<br>- Mosaic                                       |
| Gain Control                | Support                                                                                                                           |
| White Balance               | ATW / Narrow ATW / AWC / Manual / Indoor / Outdoor                                                                                |
| LDC                         | Support (Fill/stretch mode)                                                                                                       |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker (2~1/12,000sec)<br>Auto prefer shutter control(Based on AI engine)                               |
| Digital PTZ                 | Support                                                                                                                           |
| Video Rotation              | Flip, Mirror, Hallway view(90°/270°)                                                                                              |

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|                           |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analytics                 | <ul style="list-style-type: none"><li>- Analytics events based on AI engine(NPU) : Object detection (Person/Face/Vehicle(car/truck/bus/bicycle/bike)/Licence plate), IVA (Virtual line/Area, Enter/Exit, Loitering, direction, intrusion)</li><li>- Analytics events : Defocus detection, Motion detection, Tampering, Fog detection, Audio detection, Sound classification, Shock detection, Appear/Disappear</li></ul> |
| Business Intelligence     | Based on AI engine(NPU) : People counting, Queue management, Heatmap                                                                                                                                                                                                                                                                                                                                                     |
| Serial Interface          | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Alarm I/O                 | 2 configurable I/O ports                                                                                                                                                                                                                                                                                                                                                                                                 |
| Alarm Triggers            | Analytics, Network disconnect, Alarm input, App event, Time schedule                                                                                                                                                                                                                                                                                                                                                     |
| Alarm Events              | <p>When alarm trigger occurred</p> <ul style="list-style-type: none"><li>- File upload(image) : e-mail/FTP</li><li>- File upload(video clip) : FTP</li><li>- Notification : e-mail</li><li>- Recording : SD/SDHC/SDXC or NAS recording at event triggers</li><li>- Alarm output</li><li>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)</li><li>- Audio clip playback</li><li>- PTZ preset</li></ul>              |
| Audio In                  | Selectable(mic in/line in)<br>Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm                                                                                                                                                                                                                                                                                                                                       |
| Audio Out                 | Line out, Max.output level: 1Vrms                                                                                                                                                                                                                                                                                                                                                                                        |
| IR Viewable Length        | WiselR40m(131.23ft)(TBD)                                                                                                                                                                                                                                                                                                                                                                                                 |
| IR Illuminator (Optional) | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Water Removal             | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Auto Tracking             | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Coaxial Protocol          | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Color Palettes            | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Radiometry</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Temperature Detect Range  | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Temperature Accuracy      | None                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Temperature Detection     | None                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|                                   |                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Additional                        | None                                                                                                                                                                                                                                                                                                                                                               |
| <b>Network</b>                    |                                                                                                                                                                                                                                                                                                                                                                    |
| Ethernet                          | Metal shielded RJ-45(10/100BASE-T)                                                                                                                                                                                                                                                                                                                                 |
| Video Compression                 | H.265/H.264: Main/High, MJPEG                                                                                                                                                                                                                                                                                                                                      |
| Audio Compression                 | 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                                                                                                                                                                                                                                 |
| Smart Codec                       | Manual(5ea area), WiseStreamII, WiseStreamIII(Based on AI engine)                                                                                                                                                                                                                                                                                                  |
| Video Quality Adjustment          | H.264/H.265: Target bitrate level control<br>MJPEG: Target bitrate level control                                                                                                                                                                                                                                                                                   |
| Bitrate Control                   | H.264/H.265: CBR or VBR<br>MJPEG: VBR                                                                                                                                                                                                                                                                                                                              |
| Streaming                         | Unicast(20 users) / Multicast<br>Multiple streaming(Up to 10 profiles, 3 virtual channel support)                                                                                                                                                                                                                                                                  |
| Protocol                          | IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)                                                                                                                                                         |
| 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, EAP-PEAP MSCHAPv2)<br>Device Certificate(Hanwha Techwin Root CA, pre-installed)<br>Secure by default certificate<br>HTPM (Hanwha Trusted platform module)<br>Secure OS/Boot/Storage, Verify firmware forgery |
| Application Programming Interface | ONVIF Profile S/G/T<br>SUNAPI(HTTP API)<br>Wisenet open platform                                                                                                                                                                                                                                                                                                   |
| <b>General</b>                    |                                                                                                                                                                                                                                                                                                                                                                    |
| Webpage Language                  | English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Greek,                                                                                                                                                                                                                         |

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|                                       |                                                                                                                                                                                                                                          |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | Hungarian                                                                                                                                                                                                                                |
| Web Viewer                            | None                                                                                                                                                                                                                                     |
| Edge Storage                          | Micro SD/SDHC/SDXC 1slot 512GB                                                                                                                                                                                                           |
| Memory                                | 4GB RAM, 512MB Flash                                                                                                                                                                                                                     |
| <b>Environmental &amp; Electrical</b> |                                                                                                                                                                                                                                          |
| Operating Temperature / Humidity      | -40°C~+55°C(-40°F ~ +131°F)<br>* Maximum temperature : +60°C (intermittent)<br>NEMA TS-2 : 74°C<br>* Start up should be done at above -20°C<br>less than 95%RH(non-condensing), 100%RH(condensing)(TBD)<br>Humidity control /w GORE vent |
| Storage Temperature / Humidity        | -50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                         |
| Certification                         | IP66/IP67/NEMA4X, IK10                                                                                                                                                                                                                   |
| Input Voltage                         | PoE(IEEE802.3af, Class3), 12VDC                                                                                                                                                                                                          |
| Power Consumption                     | TBD                                                                                                                                                                                                                                      |
| <b>Mechanical</b>                     |                                                                                                                                                                                                                                          |
| Color / Material                      | White / Aluminum<br>Hard-coated dome bubble                                                                                                                                                                                              |
| RAL Code                              | RAL9003                                                                                                                                                                                                                                  |
| Product Dimensions / Weight           | Ø160x118mm(Ø6.30x4.65"), 1450g(3.20 lb) (TBD)                                                                                                                                                                                            |
| Compatible Conduit hole / Gangbox     | 1/2" (M20)<br>single, double, 4" octagon, 4" square                                                                                                                                                                                      |
| Hanging Mount (Dome)                  | SBP-167HMW                                                                                                                                                                                                                               |
| Skin Cover (Dome)                     | None                                                                                                                                                                                                                                     |
| Weather Cap (Dome)                    | SBV-160WCW                                                                                                                                                                                                                               |
| Power Module                          | None                                                                                                                                                                                                                                     |
| Backbox                               | None                                                                                                                                                                                                                                     |
| <b>DORI (EN62676-4 standard)</b>      |                                                                                                                                                                                                                                          |
| Detect (25PPM/ 8PPF)                  | Wide: 44.8m(147.02ft) / Tele: 151.3m(496.29ft)                                                                                                                                                                                           |

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|                              |                                              |
|------------------------------|----------------------------------------------|
| Observe (63PPM/<br>19PPF)    | Wide: 17.9m(58.81ft) / Tele: 60.5m(198.52ft) |
| Recognize (125PPM/<br>38PPF) | Wide: 9.0m(29.4ft) / Tele: 30.3m(99.26ft)    |
| Identify (250PPM/<br>76PPF)  | Wide: 4.5m(14.7ft) / Tele: 15.1m(49.63ft)    |

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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.

☒ AC 100 V, 60 Hz      ☒ PoE

## 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-C8083R   | -             | HANWHA VISION<br>VIETNAM COMPANY<br>LIMITED | EUT     |

## 1.5 Support Equipments

| Description      | Model Number                | Serial Number      | Manufacturer                                       | Remarks |
|------------------|-----------------------------|--------------------|----------------------------------------------------|---------|
| AC/DC Adapter    | 2ACB022F                    | -                  | Channel Well<br>Technology(Guangzhou)<br>Co., Ltd. | -       |
| PoE Adapter      | PSE156G 4-Pair,Hi-<br>Power | -                  | KME-Tech                                           | -       |
| Notebook         | HSN-Q07C                    | 5CD8367KND         | HP                                                 | -       |
| Notebook Adapter | HSTNN-CA40                  | WFTKU0ERLB4Q<br>CH | HP                                                 | -       |
| Alarm1           | -                           | -                  | -                                                  | -       |
| Alarm2           | -                           | -                  | -                                                  | -       |
| Smartphone       | LG-SU760                    | 108KPQJ0186212     | LG                                                 | -       |
| Earphone         | EG920                       | -                  | SAMSUNG                                            | -       |
| MIC              | MP1000                      | -                  | -                                                  | -       |
| Micro SD Card    | -                           | -                  | SanDisk                                            | 16 GB   |

## 1.6 External I/O Cabling

### ■ DC Mode

| Start                |           | END           |           | Cable Spec. |        |
|----------------------|-----------|---------------|-----------|-------------|--------|
| Description          | I/O Port  | Description   | I/O Port  | Length      | Shield |
| NETWORK CAMERA (EUT) | RJ-45     | Notebook      | RJ-45     | 3.5         | U      |
|                      | Alarm OUT | Alarm1        | Alarm IN  | 3.0         | U      |
|                      | Alarm IN  | Alarm2        | Alarm OUT | 3.0         | U      |
|                      | Audio OUT | Earphone      | Audio IN  | 1.4         | U      |
|                      | Audio IN  | MIC           | Audio OUT | 1.6         | U      |
|                      | SLOT      | Micro SD Card | SLOT      | -           | -      |
| Notebook             | 3.5 mm    | Smartphone    | 3.5 mm    | 0.5         | U      |

\* Unshielded=U, Shielded=S

### ■ PoE Mode

| Start                |             | END           |             | Cable Spec. |        |
|----------------------|-------------|---------------|-------------|-------------|--------|
| Description          | I/O Port    | Description   | I/O Port    | Length      | Shield |
| NETWORK CAMERA (EUT) | RJ-45 (PoE) | PoE Adapter   | RJ-45 (PoE) | 3.5         | U      |
|                      | Alarm OUT   | Alarm1        | Alarm IN    | 3.0         | U      |
|                      | Alarm IN    | Alarm2        | Alarm OUT   | 3.0         | U      |
|                      | Audio OUT   | Earphone      | Audio IN    | 1.4         | U      |
|                      | Audio IN    | MIC           | Audio OUT   | 1.6         | U      |
|                      | SLOT        | Micro SD Card | SLOT        | -           | -      |
| Notebook             | RJ-45 (LAN) | PoE Adapter   | RJ-45 (LAN) | 3.0         | U      |
|                      | 3.5 mm      | Smartphone    | 3.5 mm      | 0.5         | U      |

\* Unshielded=U, Shielded=S



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### 1.7 EUT Operating Mode(s)

#### ■ DC / PoE Mode

| Test Mode | operating                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation | the test was conducted while checking the camera video output from the laptop and making sure that they operate normally while performing a ping test. |

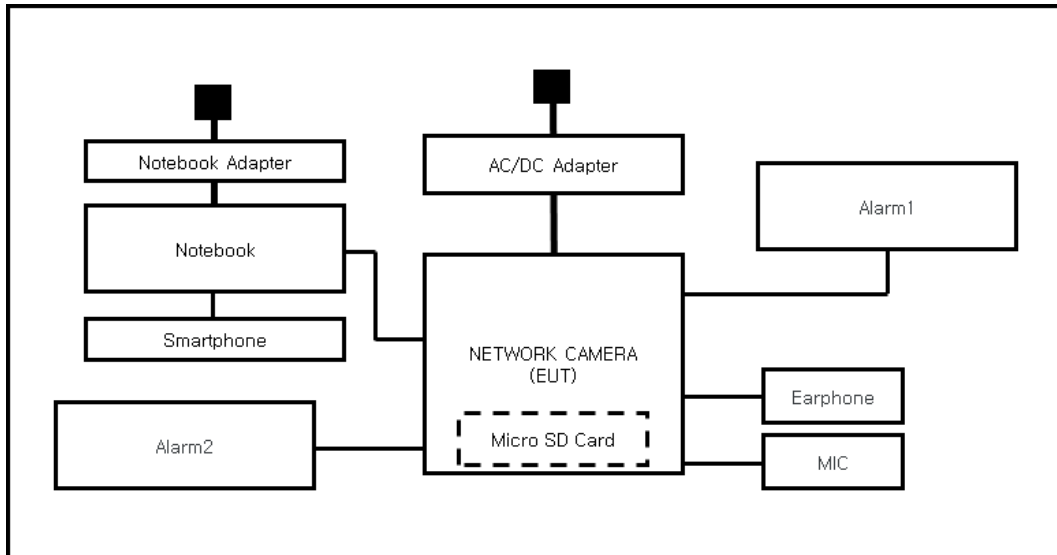
| EUT Test operating S/W |         |                        |
|------------------------|---------|------------------------|
| Name                   | Version | Manufacture Company    |
| Web Viewer             | -       | Hanwha Vision Co., Ltd |

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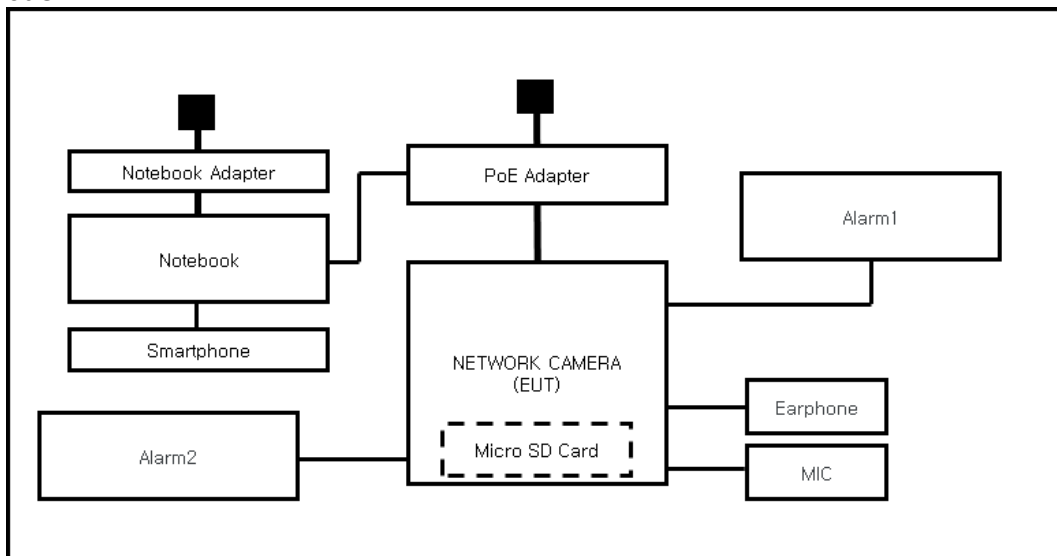
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC Mode



### ■ PoE Mode



## 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

☐ Group 2

☐ Class A

☐ 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



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- 
- |                                                                |                                             |                                  |
|----------------------------------------------------------------|---------------------------------------------|----------------------------------|
| <input checked="" type="checkbox"/> <b>VCCI-CISPR 32:2016</b>  | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR32:2015</b>            | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>      |                                             |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010                | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2017                       |                                             |                                  |
| <input type="checkbox"/> <b>IC Regulation ICES-003 Issue 7</b> |                                             |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 32:17                   | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2017                       | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
|                                                                |                                             |                                  |
| <input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>       |                                             |                                  |
|                                                                |                                             |                                  |
| <input type="checkbox"/> EN 301 489-1 V2.2.3                   |                                             |                                  |
| <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 Mains Power Ports

### Test Date

Apr. 07, 2021

### 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        | 101783        | 01, 15, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 12, 29, 2021 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 12, 29, 2021 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 12, 29, 2021 |

### Test Conditions

Temperature: (24,0 ± 0,1) °C

Relative Humidity: (45,8 ± 0,2) % 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.



## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Apr. 07, 2021

### 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        | 101783        | 01, 15, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 12, 29, 2021 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 12, 29, 2021 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 12, 29, 2021 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 12, 30, 2021 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 12, 30, 2021 |
| <input type="checkbox"/>            | CDN               | CDNS502A     | TESEQ        | 40431         | 12, 29, 2021 |

### Test Conditions

Temperature: (24,0 ± 0,1) °C  
Relative Humidity: (45,8 ± 0,1) % 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

Apr. 07, 2021

### 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, 01, 2022 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 25, 2021 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 12, 08, 2022 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 10, 2022 |

### Test Conditions

Temperature: (23,6 ± 0,1) °C

Relative Humidity: (44,8 ± 0,2) % 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

Apr. 08, 2021

### 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, 05, 2021 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01742    | 12, 29, 2021 |
| <input type="checkbox"/>            | ATTENUATOR                 | 8491A        | HP               | 35496         | 03, 10, 2022 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 03, 11, 2022 |

### Test Conditions

Temperature: (24,1 ± 0,1) °C

Relative Humidity: (45,3 ± 0,2) % 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.

## APPENDIX A – TEST DATA

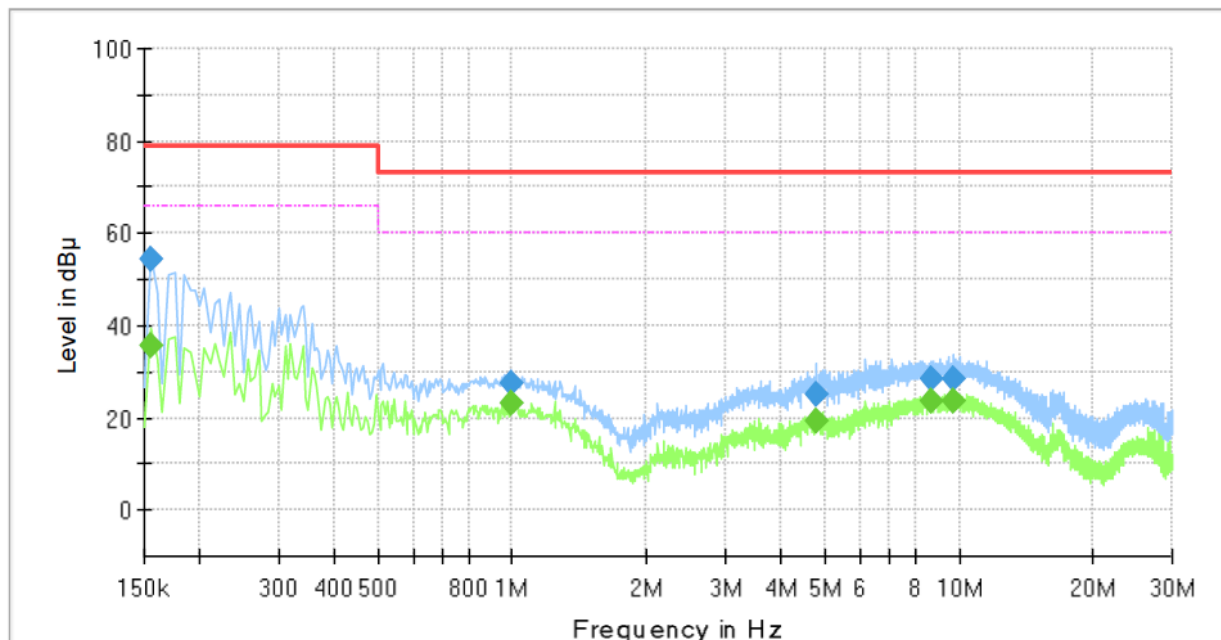
### Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

### Common Information

|                   |                    |
|-------------------|--------------------|
| Test Description: | Conducted Emission |
| Model No.:        | XNV-C8083R         |
| Phase:            | L1                 |
| Mode:             | DC                 |
| Operator Name:    | KES                |



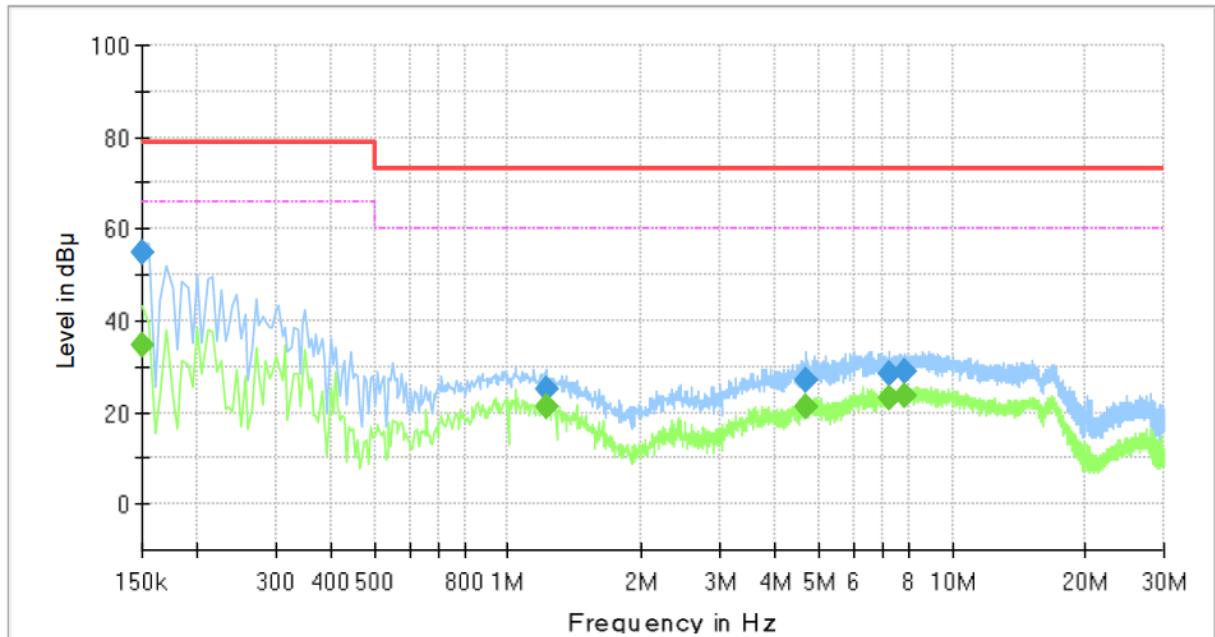
### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.155000        | ---              | 35.49           | 66.00        | 30.51       | 1000.0          | 9.000           | L1   | 19.4       |
| 0.155000        | 54.17            | ---             | 79.00        | 24.83       | 1000.0          | 9.000           | L1   | 19.4       |
| 1.000000        | ---              | 22.92           | 60.00        | 37.08       | 1000.0          | 9.000           | L1   | 20.0       |
| 1.000000        | 27.41            | ---             | 73.00        | 45.59       | 1000.0          | 9.000           | L1   | 20.0       |
| 4.790000        | ---              | 19.21           | 60.00        | 40.79       | 1000.0          | 9.000           | L1   | 19.7       |
| 4.790000        | 25.10            | ---             | 73.00        | 47.90       | 1000.0          | 9.000           | L1   | 19.7       |
| 8.645000        | ---              | 23.39           | 60.00        | 36.61       | 1000.0          | 9.000           | L1   | 19.7       |
| 8.645000        | 28.28            | ---             | 73.00        | 44.72       | 1000.0          | 9.000           | L1   | 19.7       |
| 9.675000        | ---              | 23.46           | 60.00        | 36.54       | 1000.0          | 9.000           | L1   | 19.8       |
| 9.675000        | 28.39            | ---             | 73.00        | 44.61       | 1000.0          | 9.000           | L1   | 19.8       |

## NEUTRAL LINE

### Common Information

|                   |                    |
|-------------------|--------------------|
| Test Description: | Conducted Emission |
| Model No.:        | XNV-C8083R         |
| Phase:            | N                  |
| Mode:             | DC                 |
| Operator Name:    | KES                |



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.150000        | ---              | 34.89           | 66.00        | 31.11       | 1000.0          | 9.000           | N    | 19.4       |
| 0.150000        | 54.68            | ---             | 79.00        | 24.32       | 1000.0          | 9.000           | N    | 19.4       |
| 1.215000        | ---              | 21.21           | 60.00        | 38.79       | 1000.0          | 9.000           | N    | 20.0       |
| 1.215000        | 25.30            | ---             | 73.00        | 47.70       | 1000.0          | 9.000           | N    | 20.0       |
| 4.670000        | ---              | 21.34           | 60.00        | 38.66       | 1000.0          | 9.000           | N    | 19.7       |
| 4.670000        | 27.07            | ---             | 73.00        | 45.93       | 1000.0          | 9.000           | N    | 19.7       |
| 7.250000        | ---              | 23.19           | 60.00        | 36.81       | 1000.0          | 9.000           | N    | 19.5       |
| 7.250000        | 28.44            | ---             | 73.00        | 44.56       | 1000.0          | 9.000           | N    | 19.5       |
| 7.850000        | ---              | 23.70           | 60.00        | 36.30       | 1000.0          | 9.000           | N    | 19.6       |
| 7.850000        | 28.78            | ---             | 73.00        | 44.22       | 1000.0          | 9.000           | N    | 19.6       |

#### ◆ Calculation

QuasiPeak [dBμV] / CAverage [dBμV] = Reading Value [dBμV] + 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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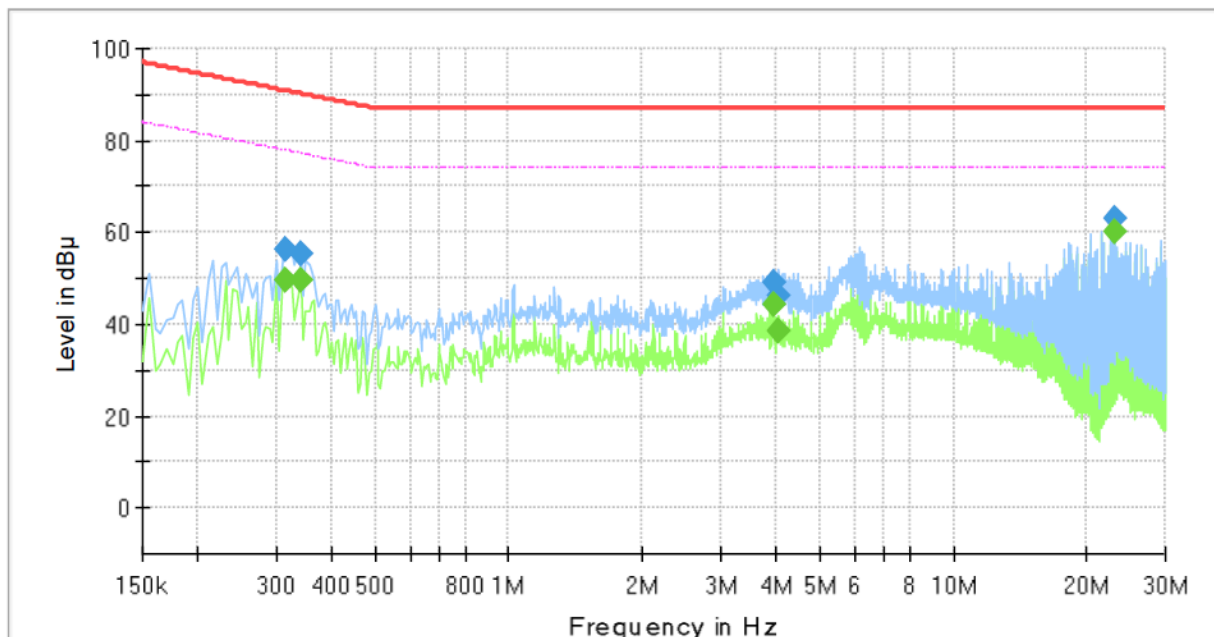
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNV-C8083R                 |
| Mode :            | DC                         |
| Speed :           | 100 Mbps                   |
| Operator Name:    | KES                        |

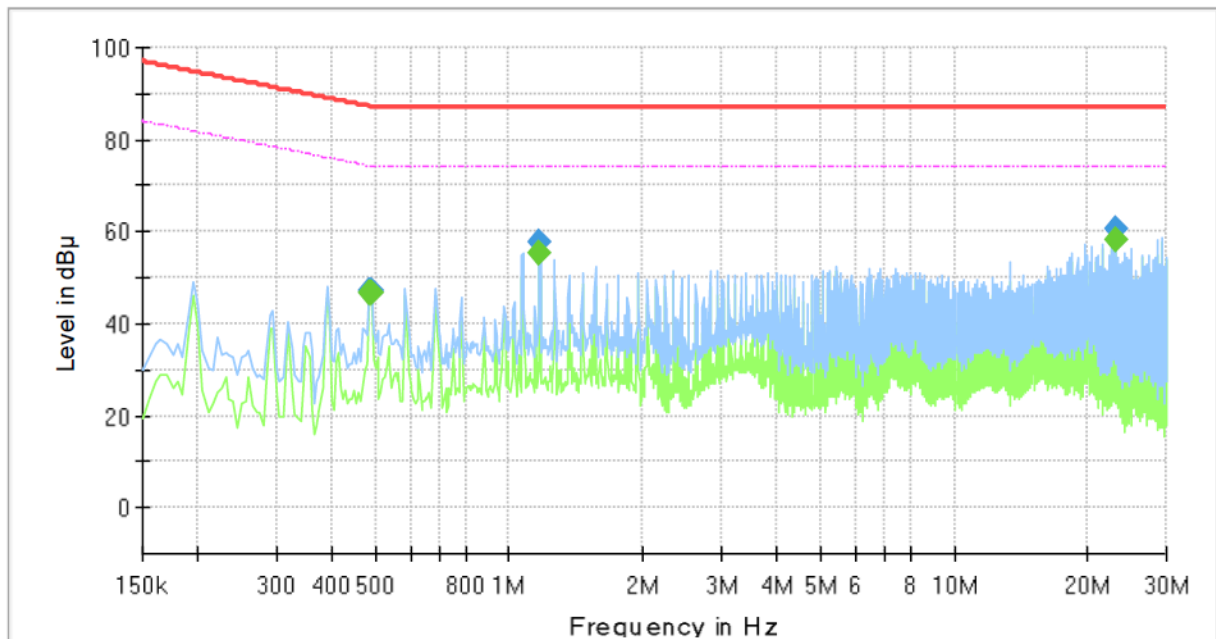


### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.315000        | ---              | 49.58           | 77.84        | 28.26       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.315000        | 56.17            | ---             | 90.84        | 34.67       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.340000        | ---              | 49.65           | 77.20        | 27.55       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.340000        | 55.32            | ---             | 90.20        | 34.88       | 1000.0          | 9.000           | Single Line | 19.7       |
| 3.955000        | ---              | 44.34           | 74.00        | 29.66       | 1000.0          | 9.000           | Single Line | 19.7       |
| 3.955000        | 49.18            | ---             | 87.00        | 37.82       | 1000.0          | 9.000           | Single Line | 19.7       |
| 4.060000        | ---              | 38.32           | 74.00        | 35.68       | 1000.0          | 9.000           | Single Line | 19.6       |
| 4.060000        | 45.98            | ---             | 87.00        | 41.02       | 1000.0          | 9.000           | Single Line | 19.6       |
| 23.130000       | ---              | 60.31           | 74.00        | 13.69       | 1000.0          | 9.000           | Single Line | 20.1       |
| 23.130000       | 62.98            | ---             | 87.00        | 24.02       | 1000.0          | 9.000           | Single Line | 20.1       |

**PoE Mode**
**[100 Mbps]**
**Common Information**

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNV-C8083R                 |
| Mode :            | PoE                        |
| Speed :           | 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.485000        | ---              | 46.51           | 74.25        | 27.74       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.485000        | 47.21            | ---             | 87.25        | 40.04       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.490000        | ---              | 46.58           | 74.17        | 27.59       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.490000        | 47.32            | ---             | 87.17        | 39.85       | 1000.0          | 9.000           | Single Line | 19.8       |
| 1.170000        | ---              | 55.40           | 74.00        | 18.60       | 1000.0          | 9.000           | Single Line | 20.0       |
| 1.170000        | 57.82            | ---             | 87.00        | 29.18       | 1000.0          | 9.000           | Single Line | 20.0       |
| 23.130000       | ---              | 58.14           | 74.00        | 15.86       | 1000.0          | 9.000           | Single Line | 20.1       |
| 23.130000       | 60.61            | ---             | 87.00        | 26.39       | 1000.0          | 9.000           | Single Line | 20.1       |

**◆ Calculation**

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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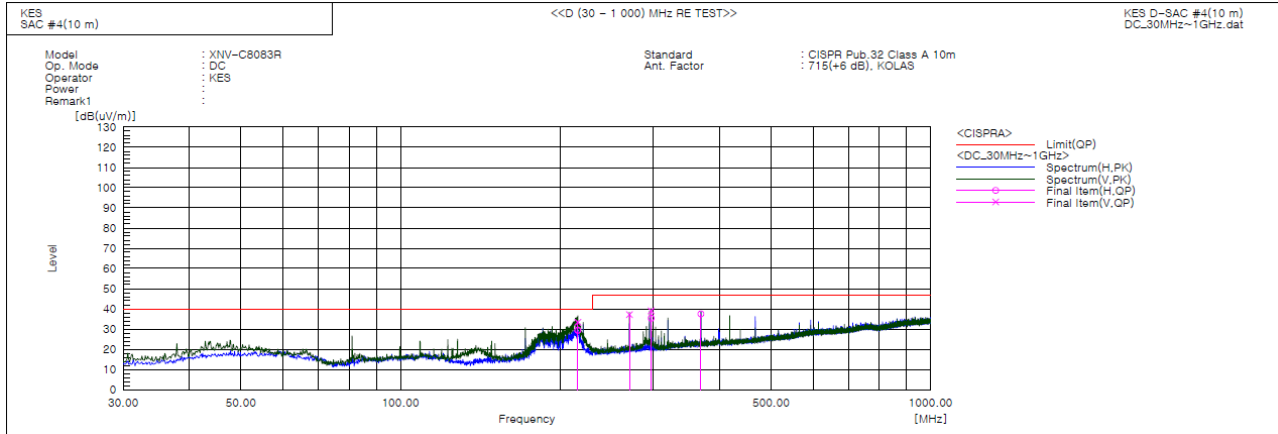
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## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 215.998            | V   | 53.7                      | -20.3            | 33.4                       | 40.0                      | 6.6                  | 100.0          | 22.0           |        |
| 2   | 215.998            | H   | 49.7                      | -20.3            | 29.4                       | 40.0                      | 10.6                 | 377.0          | 151.0          |        |
| 3   | 270.318            | V   | 55.9                      | -18.7            | 37.2                       | 47.0                      | 9.8                  | 172.0          | 196.0          |        |
| 4   | 296.993            | V   | 57.1                      | -18.0            | 39.1                       | 47.0                      | 7.9                  | 261.0          | 58.0           |        |
| 5   | 296.993            | H   | 53.4                      | -18.0            | 35.4                       | 47.0                      | 11.6                 | 400.0          | 21.0           |        |
| 6   | 368.651            | H   | 52.5                      | -15.0            | 37.5                       | 47.0                      | 9.5                  | 251.0          | 28.0           |        |

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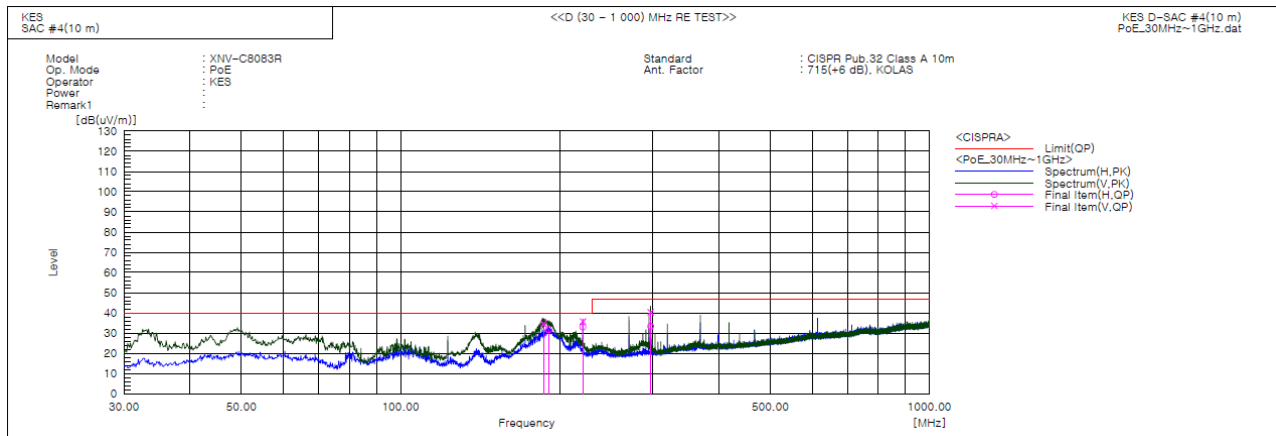
3701, 40, Simin-daero 365beon-gil,  
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Report No.:

KES-EM-21T0300-R1

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### ■ PoE Mode



### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(μV)] | c.f [dB(1/m)] | Result QP [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 186.413         | V   | 57.2                | -22.6         | 34.6                 | 40.0                | 5.4            | 142.0       | 342.0       |        |
| 2   | 190.656         | H   | 53.6                | -21.9         | 31.7                 | 40.0                | 8.3            | 400.0       | 182.0       |        |
| 3   | 221.211         | V   | 55.9                | -20.1         | 35.8                 | 40.0                | 4.2            | 100.0       | 27.0        |        |
| 4   | 221.211         | H   | 53.1                | -20.1         | 33.0                 | 40.0                | 7.0            | 367.0       | 221.0       |        |
| 5   | 296.993         | H   | 51.4                | -18.0         | 33.4                 | 47.0                | 13.6           | 261.0       | 36.0        |        |
| 6   | 296.993         | V   | 58.4                | -18.0         | 40.4                 | 47.0                | 6.6            | 112.0       | 49.0        |        |

### ◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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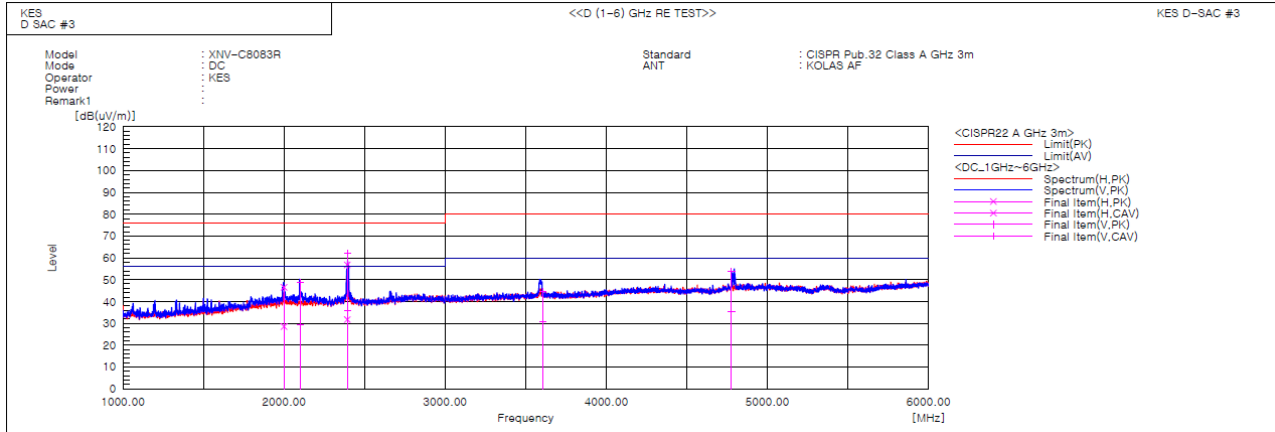
Report No.:

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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC Mode



### 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   | 1999.419        | H   | 47.4                | 29.4                 | -0.9          | 46.5                 | 28.5                  | 76.0                | 56.0                | 29.5           | 27.5            | 100.0       | 267.3       |        |
| 2   | 2098.740        | V   | 49.3                | 30.0                 | -0.7          | 48.6                 | 29.3                  | 76.0                | 56.0                | 27.4           | 26.7            | 100.0       | 14.9        |        |
| 3   | 2392.720        | V   | 62.1                | 35.7                 | 0.1           | 62.2                 | 35.8                  | 76.0                | 56.0                | 13.8           | 20.2            | 100.0       | 150.3       |        |
| 4   | 2391.671        | H   | 56.7                | 31.7                 | 0.1           | 56.8                 | 31.8                  | 76.0                | 56.0                | 19.2           | 24.2            | 100.0       | 353.6       |        |
| 5   | 3604.926        | V   | 40.3                | 26.8                 | 4.1           | 44.4                 | 30.9                  | 80.0                | 60.0                | 35.6           | 29.1            | 100.0       | 231.1       |        |
| 6   | 4776.793        | V   | 45.6                | 27.3                 | 8.3           | 53.9                 | 35.6                  | 80.0                | 60.0                | 26.1           | 24.4            | 100.0       | 30.2        |        |

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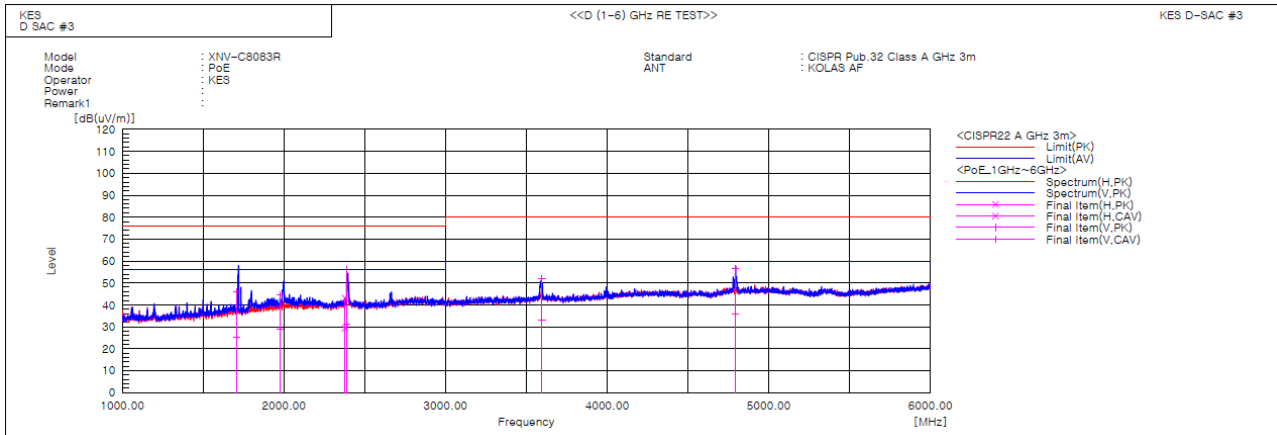


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### ■ PoE Mode



| 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   | 1708.752        | V   | 49.9                | 29.4                 | -4.1          | 45.8                 | 25.3                  | 76.0                | 56.0                | 30.2           | 30.7            | 100.0       | 226.1       |        |
| 2   | 1976.294        | V   | 45.6                | 30.1                 | -1.1          | 44.5                 | 29.0                  | 76.0                | 56.0                | 31.5           | 27.0            | 100.0       | 17.2        |        |
| 3   | 2378.132        | H   | 43.1                | 29.3                 | 0.1           | 43.2                 | 29.4                  | 76.0                | 56.0                | 32.8           | 26.6            | 100.0       | 353.9       |        |
| 4   | 2389.420        | V   | 55.8                | 31.0                 | 0.1           | 55.9                 | 31.1                  | 76.0                | 56.0                | 20.1           | 24.9            | 100.0       | 244.1       |        |
| 5   | 3596.798        | V   | 48.1                | 28.9                 | 4.0           | 52.1                 | 32.9                  | 80.0                | 60.0                | 27.9           | 27.1            | 100.0       | 162.7       |        |
| 6   | 4793.940        | V   | 48.1                | 27.3                 | 8.4           | 56.5                 | 35.7                  | 80.0                | 60.0                | 23.5           | 24.3            | 100.0       | 37.6        |        |

### ◆ 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 Emissions at Mains Power Ports

#### ■ DC Mode



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## Conducted Emissions at Telecommunication Ports

### ■ DC Mode



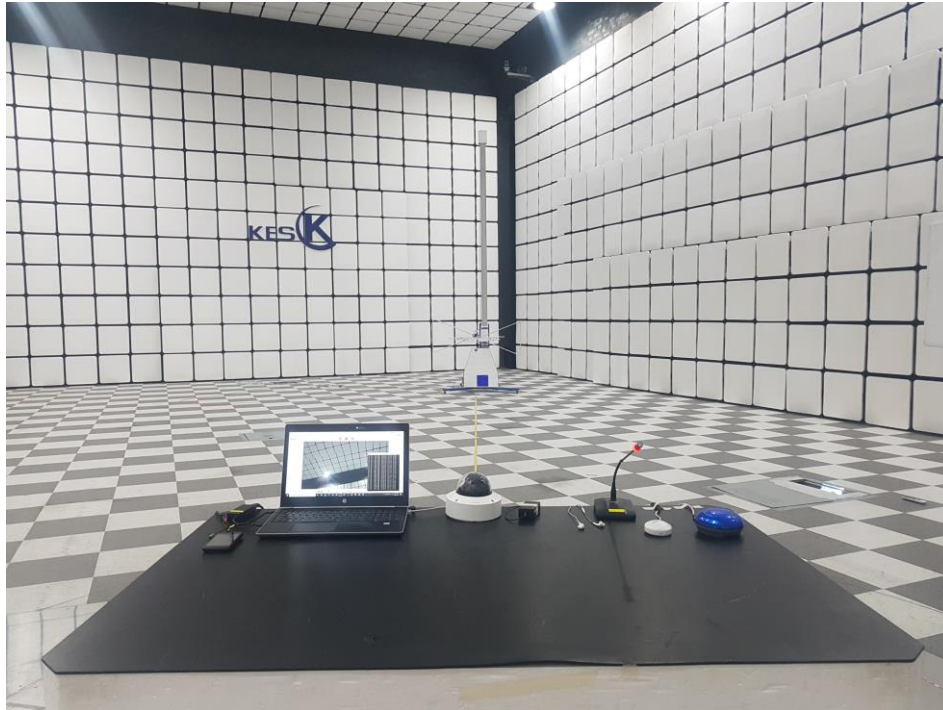
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## ■ PoE Mode



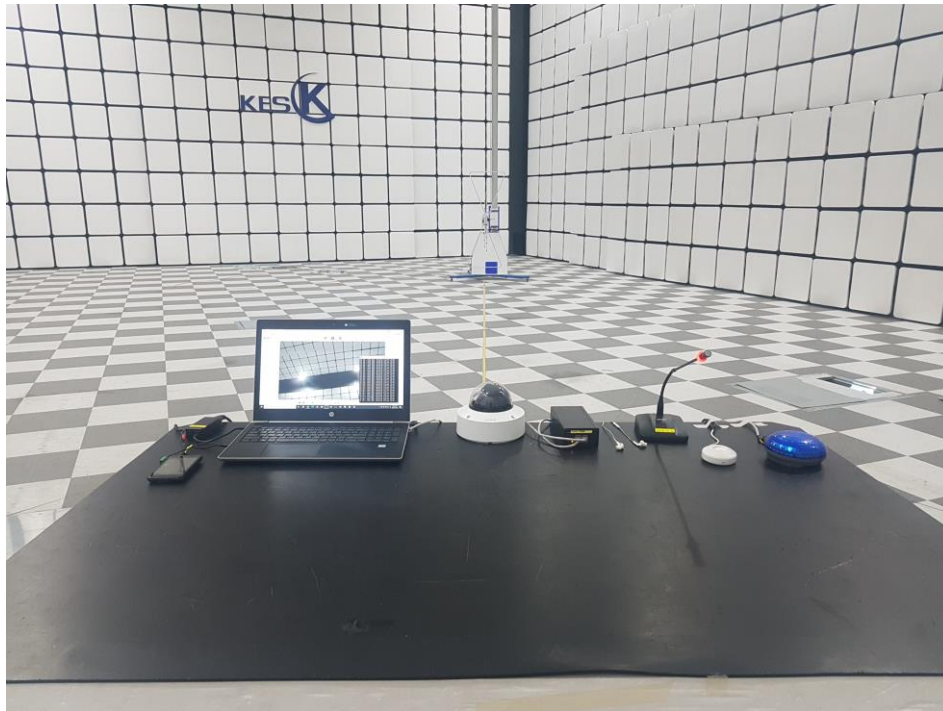
## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



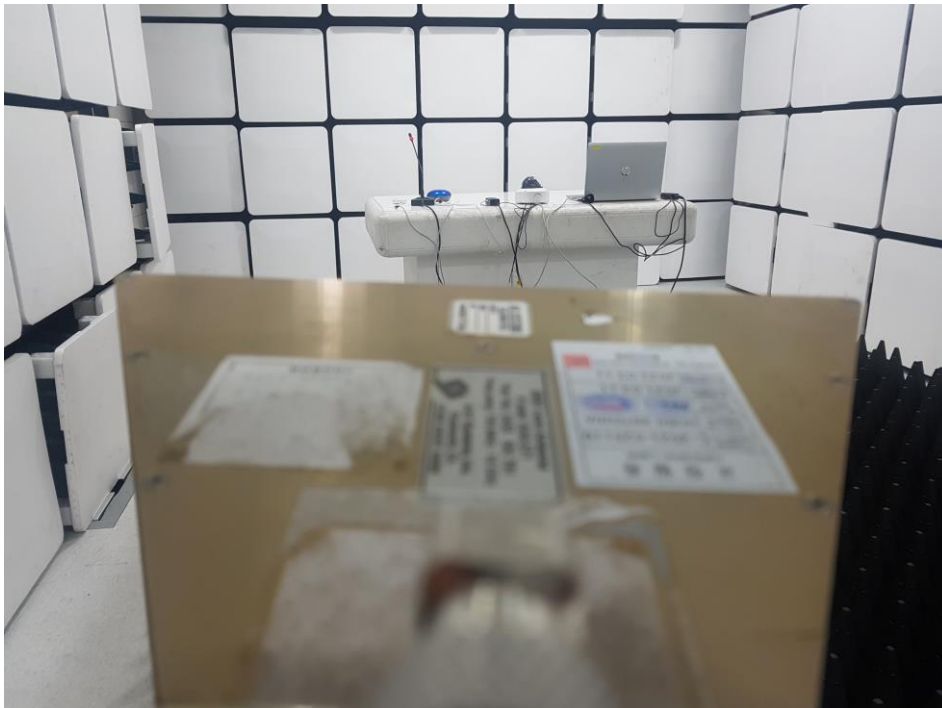
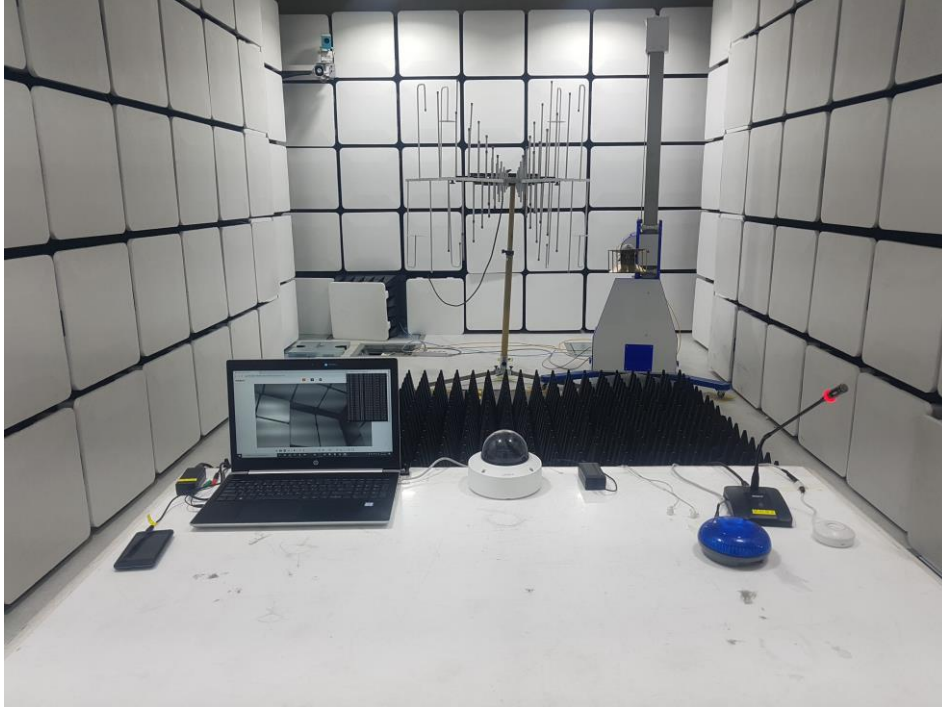
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## ■ PoE Mode



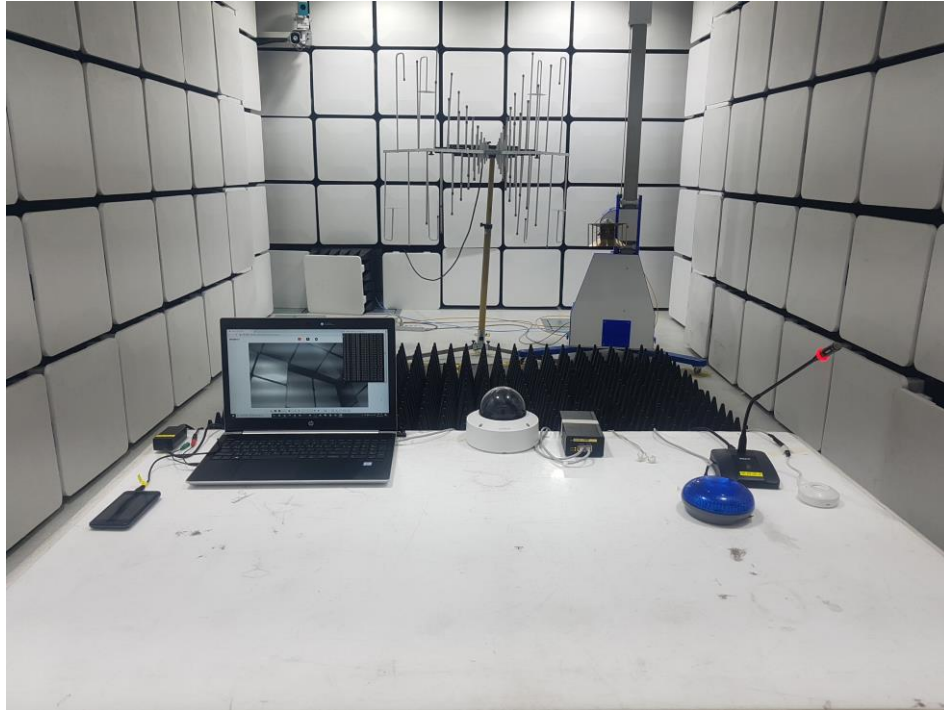
## Radiated Electric Field Emissions(Above 1 GHz)

### ■ DC Mode



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## ■ PoE Mode



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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)

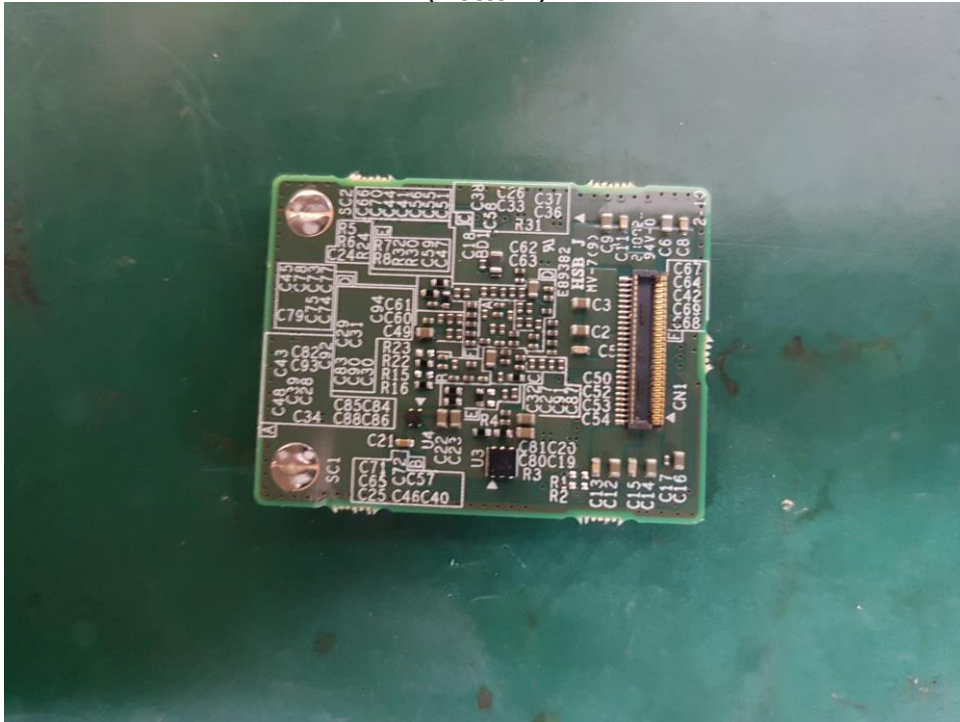


## EUT Internal View – Board 1

(Top)



(Bottom)



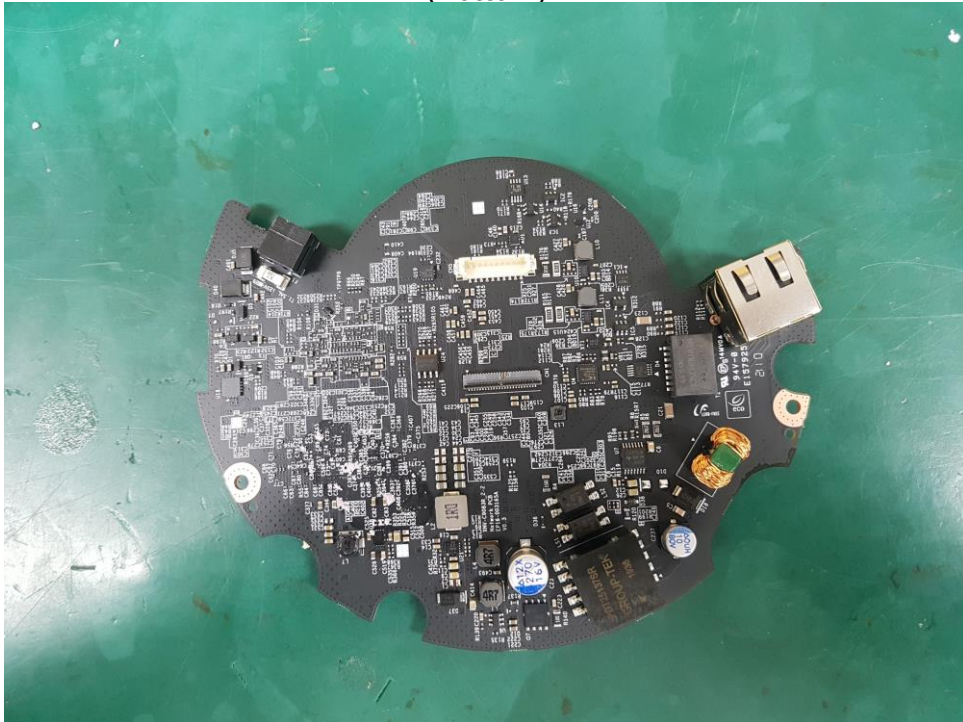
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## EUT Internal View – Board 2

(Top)



(Bottom)



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## EUT Internal View – Board 3

(Top)



(Bottom)



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## EUT Internal View – Board 4

(Top)



(Bottom)



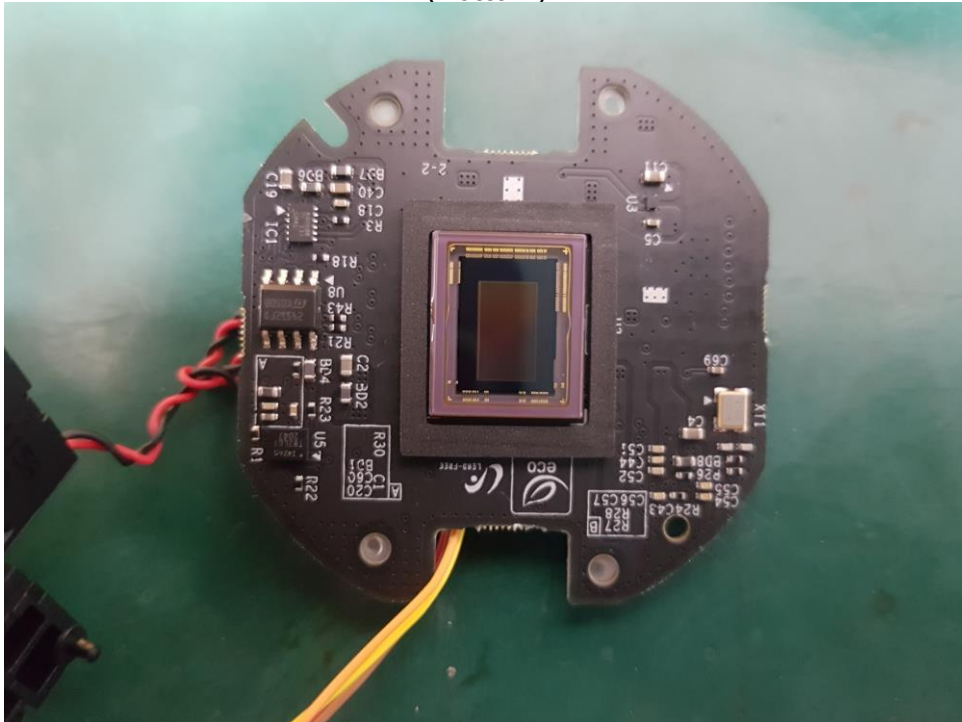
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## EUT Internal View – Board 5

(Top)



(Bottom)



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## EUT Internal View – Lens

(Top)

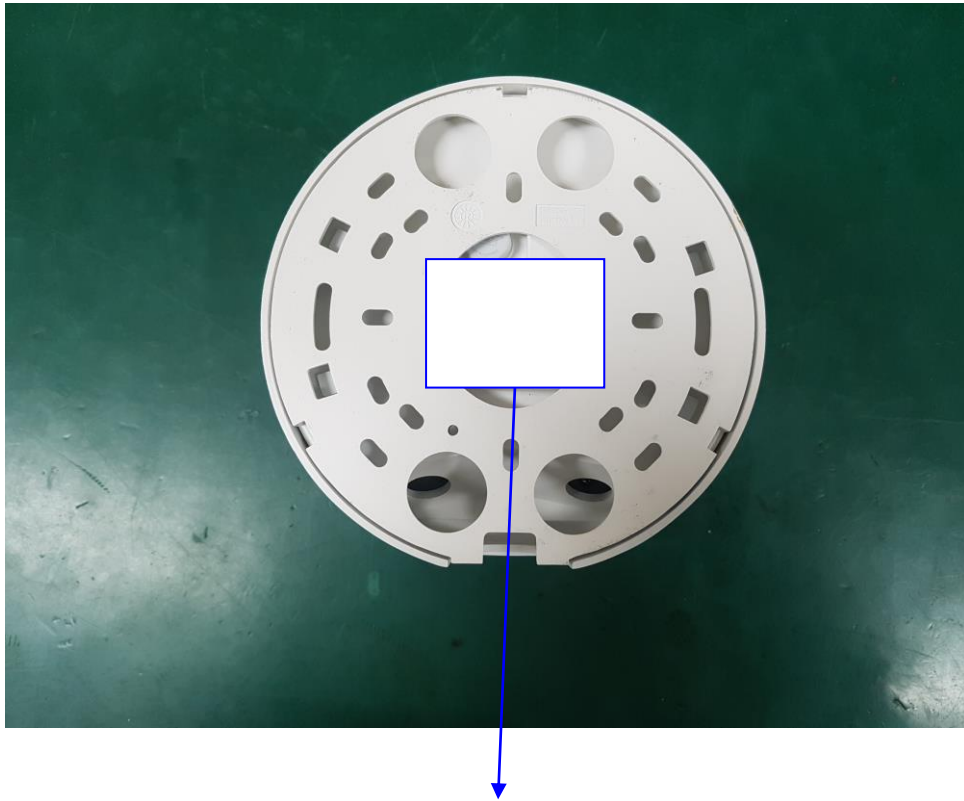


(Bottom)



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## Label Photographs



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VCCI-A