

## EMC TEST REPORT For RCM

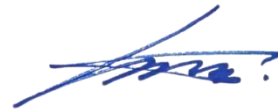
Test Report No. : KES-EM-22T0070-R1  
Date of Issue : Feb. 24, 2023  
Product name : NETWORK CAMERA  
Model/Type No. : XNF-8010RVM  
Variant Model : -  
Applicant : Hanwha Vision Co., Ltd  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : 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 : Jan. 03, 2022  
Test date : Jan. 03, 2022 ~ Jan. 04, 2022  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by



Se Heon, Kim  
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.



## REPORT REVISION HISTORY

| Date          | Test Report No.   | Revision History                                                      |
|---------------|-------------------|-----------------------------------------------------------------------|
| Jan. 18, 2022 | KES-EM-22T0070    | Issued                                                                |
| Feb. 24, 2023 | KES-EM-22T0070-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:

|                             |                                                                                                                                                                                                                                                                     |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Video                       |                                                                                                                                                                                                                                                                     |
| Imaging Device              | 1/1.8" 6M CMOS                                                                                                                                                                                                                                                      |
| Total Pixels                | 3,096x2,094                                                                                                                                                                                                                                                         |
| Effective Pixels            | 2,048x2,048                                                                                                                                                                                                                                                         |
| Scanning System             | Progressive                                                                                                                                                                                                                                                         |
| Min. Illumination           | Color : 0.07Lux(F2.2, 30IRE)<br>B/W : 0 Lux (IR LED On)                                                                                                                                                                                                             |
| S / N Ratio                 | 50dB                                                                                                                                                                                                                                                                |
| Video Out                   | CVBS : 1.0 Vp-p / 75Ω composite, 714x480(N), 702x576(P), for installation<br>- DIP connector type<br>USB                                                                                                                                                            |
| Lens                        |                                                                                                                                                                                                                                                                     |
| Focal Length (Zoom Ratio)   | 1.6mm                                                                                                                                                                                                                                                               |
| Max. Aperture Ratio         | F1.6                                                                                                                                                                                                                                                                |
| Angular Field of View       | H : 187° / V : 187° / D : 187°                                                                                                                                                                                                                                      |
| Min. Object Distance        | 0.3m                                                                                                                                                                                                                                                                |
| Focus Control               | Simple Focus / Manual<br>- Remote control via network                                                                                                                                                                                                               |
| Lens Type                   | Fixed Lens                                                                                                                                                                                                                                                          |
| Mount Type                  | Board Type                                                                                                                                                                                                                                                          |
| Operational                 |                                                                                                                                                                                                                                                                     |
| Viewable Length             | 15m                                                                                                                                                                                                                                                                 |
| Camera Title                | Off / On (Displayed up to 85 characters)<br>- W/W : English/Numeric/Special Characters<br>- China : English/Numeric/Special/Chinese Characters<br>- Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White),<br>Transparency, Auto Scale by Resolution |
| Day & Night                 | Auto (ICR) / Color / B/W / External / Schedule                                                                                                                                                                                                                      |
| Backlight Compensation      | OFF / BLC / HLC(Masking / Dimming) / WDR                                                                                                                                                                                                                            |
| Wide Dynamic Range          | 120dB                                                                                                                                                                                                                                                               |
| Contrast Enhancement        | SSDR Off / On                                                                                                                                                                                                                                                       |
| Digital Noise Reduction     | SSNRV (2D+3D noise filter) Off / On                                                                                                                                                                                                                                 |
| Digital Image Stabilization | Off/On                                                                                                                                                                                                                                                              |
| Defog                       | Off/Auto(input from fog detection) / Manual                                                                                                                                                                                                                         |
| Motion Detection            | Off / On (8ea, 8point Polygonal zones), Hand over                                                                                                                                                                                                                   |
| Privacy Masking             | Off / On (32ea, Polygonal)<br>- Color : Gray, Green, Red, Blue, Black, White, Mosaic                                                                                                                                                                                |
| Gain Control                | Off / Low / Middle / High / Manual                                                                                                                                                                                                                                  |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor(Included mercury&Sodium)                                                                                                                                                                                                      |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker(2~1/12,000sec)                                                                                                                                                                                                                     |
| Digital Zoom                | 24x, Digital PTZ(Preset, Group)                                                                                                                                                                                                                                     |
| Flip / Mirror               | Off / On                                                                                                                                                                                                                                                            |
| Video & Audio Analytics     | Tampering, Loitering, Directional detection, Defocus detection, Fog detection,<br>Virtual line, Enter/Exit, (Dis)Appear, Audio detection, Face detection, Motion<br>detection, Digital auto-tracking, Sound classification                                          |
| Alarm I/O                   | Input 1ea / Output 1ea                                                                                                                                                                                                                                              |
| Alarm Triggers              | Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect, SD<br>card error, NAS error                                                                                                                                                             |
| Alarm events                | File upload via FTP and E-Mail<br>Notification via E-Mail<br>local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers<br>External output, DPTZ preset                                                                                                         |

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|                          |                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View Composition         | <Camera Side><br>Fisheye<br>Single Panorama<br>Double Panorama<br>Fisheye+4 PTZ<br>Quad view<br>Fisheye+8 PTZ                                                                                                                                                                                                                                                                                              |
| Pixel Counter            | Support                                                                                                                                                                                                                                                                                                                                                                                                    |
| Network                  |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Ethernet                 | RJ-45 (10/100BASE-T)                                                                                                                                                                                                                                                                                                                                                                                       |
| Video Compression Format | H.265/H.264/MJPEG                                                                                                                                                                                                                                                                                                                                                                                          |
| Resolution               | [Original View(1:1)] 2048x2048 / 1280x1280 / 1080x1080 / 960x960 / 768x768 / 720x720 / 640x640 / 480x480<br>[Single Panorama(4:1)] 2048x512 / 1920x480 / 1280x320 / 640x160 / 704x176<br>[Double Panorama(2:1)] 2048x1024 / 1920x960 / 1280x640 / 640x320 / 704x352<br>[Quad View(4:3)] 2048x1536 / 1600x1200 / 1280x960 / 1024x768 / 800x600 / 640x480 / 704x576<br>[Q1/2/3/4] 1024x768, 800x600, 640x480 |
| Max. Framerate           | H.265/H.264 : 30fps@2,048x2,048<br>MJPEG : Max 15fps                                                                                                                                                                                                                                                                                                                                                       |
| Smart Codec              | Manual Mode (area-based : 5EA)                                                                                                                                                                                                                                                                                                                                                                             |
| WiseStreamII             | Support                                                                                                                                                                                                                                                                                                                                                                                                    |
| Video Quality Adjustment | H.265/H.264 : Target Bitrate Level Control<br>MJPEG : Quality Level Control                                                                                                                                                                                                                                                                                                                                |
| Bitrate Control Method   | H.265/H.264 : CBR or VBR<br>MJPEG : VBR                                                                                                                                                                                                                                                                                                                                                                    |
| Streaming Capability     | Multiple Streaming (Up to 10profiles)                                                                                                                                                                                                                                                                                                                                                                      |
| Audio In                 | Selectable (Mic IN/Line IN/Built-in mic)<br>Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm                                                                                                                                                                                                                                                                                                   |
| Audio out                | Line out (3.5mm mono jack), Max output level: 1 Vrms                                                                                                                                                                                                                                                                                                                                                       |
| Audio Compression Format | G.711 u-law /G.726 Selectable<br>G.726 (ADPCM) 8KHz, G.711 8KHz<br>G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps<br>AAC-LC : 48Kbps at 16KHz                                                                                                                                                                                                                                                                      |
| Audio Communication      | Bi-directional(2way)                                                                                                                                                                                                                                                                                                                                                                                       |
| IP                       | IPv4, IPv6                                                                                                                                                                                                                                                                                                                                                                                                 |
| Protocol                 | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, SIP                                                                                                                                                                                                                        |
| Security                 | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access Log<br>802.1x Authentication (EAP-TLS, EAP-LEAP)                                                                                                                                                                                                                                                     |
| Streaming Method         | Unicast / Multicast                                                                                                                                                                                                                                                                                                                                                                                        |
| Max. User Access         | 20 users at Unicast Mode                                                                                                                                                                                                                                                                                                                                                                                   |
| Edge Storage             | SD/SDHC/SDXC 2slot(up to 512GB) - Continuous recording(1st slot to 2nd slot)<br>- motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.<br>- camera can detect automatically when the memory is connected<br>- memory status display (normal/error/active/formatting/lock)<br>NAS(Network Attached Storage)<br>Local PC for Instant Recording( plug-in viewer only )                   |

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|                                   |                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application Programming Interface | ONVIF Profile S/G<br>SUNAPI<br>Wisenet open platform                                                                                                                                                                                                                                                |
| Webpage Language                  | English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Portuguese, Turkish, Polish, Czech, Dutch, Hungary, Greek                                                                                                                                                   |
| Web Viewer                        | Supported OS: Windows 7, 8.1, 10, Mac OS X 10.9. 10.10. 10.11. 10.12<br>Plug-in Free Webviewer<br>Supported Browser : Google Chrome, MS Edge, Mozilla Firefox (Window 64bit only), Apple Safari *Mac OS X only<br>Plug-in Webviewer<br>Supported Browser : MS Explore, Apple Safari * Mac OS X only |
| Central Management Software       | Smart Viewer                                                                                                                                                                                                                                                                                        |
| Environmental                     |                                                                                                                                                                                                                                                                                                     |
| Operating Temperature / Humidity  | -10°C ~ +55°C / Less than 90% RH                                                                                                                                                                                                                                                                    |
| Storage Temperature / Humidity    | -50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                   |
| Ingress Protection                | -                                                                                                                                                                                                                                                                                                   |
| Vandal Resistance                 | -                                                                                                                                                                                                                                                                                                   |
| Electrical                        |                                                                                                                                                                                                                                                                                                     |
| Input Voltage / Current           | DC12V±10%,PoE(IEEE802.3af,Class3)                                                                                                                                                                                                                                                                   |
| Power Consumption                 | DC12V(9.5W 0.8A), PoE(10.5W 0.28A)                                                                                                                                                                                                                                                                  |
| Mechanical                        |                                                                                                                                                                                                                                                                                                     |
| Color / Material                  | Ivory/ALUMINUM, PLASTIC                                                                                                                                                                                                                                                                             |
| Dimension (WxHxD)                 | D146 x H54.8                                                                                                                                                                                                                                                                                        |
| Weight                            | 730g                                                                                                                                                                                                                                                                                                |

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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 240 V, 50 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 | XNF-8010RVM  | -             | 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<br>(Guangzhou) Co.,Ltd. | -       |
| PoE Injector     | ANY4805C-LT1  | 10H300002             | ANY ELECTRONICS CO.,<br>LTD                        | -       |
| Notebook         | P98F004       | 21599158359           | DELL INC.                                          | -       |
| Notebook Adapter | LA240PM190    | -                     | LITE-ON TECHNOLOGY<br>(CHANGZHOU)CO.,LTD.          | -       |
| Speaker          | BR-1000A CUVE | -                     | DONGGUAN EDFIER<br>TECHNOLOGY CO, LTD              | -       |
| MIC              | CMK-303       | -                     | CAMAC                                              | -       |
| Alarm            | SLE-0001 DO   | C64167JDB6012<br>68 F | -                                                  | -       |
| Button Alarm     | -             | -                     | -                                                  | -       |
| 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             | 4.0         | U      |
|                      | Audio Out | Speaker          | Line-Out (3.5 mm) | 1.4         | U      |
|                      | Audio In  | MIC              | XLR               | 1.5         | U      |
|                      | Alarm Out | Alarm            | Alarm In          | 3.0         | U      |
|                      | Alarm In  | Button Alarm     | Alarm Out         | 3.0         | U      |
|                      | SLOT      | Micro SD Card    | SLOT              | -           | -      |
|                      | DC Jack   | AC / DC Adapter  | DC Jack           | 0.8         | U      |
| Notebook             | DC Jack   | Notebook Adapter | DC Jack           | 1.3         | 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 Injector     | RJ-45 (PoE)       | 4.0         | U      |
|                      | Audio Out   | Speaker          | Line-Out (3.5 mm) | 1.4         | U      |
|                      | Audio In    | MIC              | XLR               | 1.5         | U      |
|                      | Alarm Out   | Alarm            | Alarm In          | 3.0         | U      |
|                      | Alarm In    | Button Alarm     | Alarm Out         | 3.0         | U      |
|                      | SLOT        | Micro SD Card    | SLOT              | -           | -      |
|                      |             |                  |                   |             |        |
| Notebook             | RJ-45 (LAN) | PoE Injector     | RJ-45 (LAN)       | 1.0         | U      |
|                      | DC Jack     | Notebook Adapter | DC Jack           | 1.3         | U      |

\* Unshielded=U, Shielded=S



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### 1.7 EUT Operating Mode(s)

| Test mode | operating                                  |
|-----------|--------------------------------------------|
| Operation | Monitoring EUT Using Web Viewer, Ping Test |

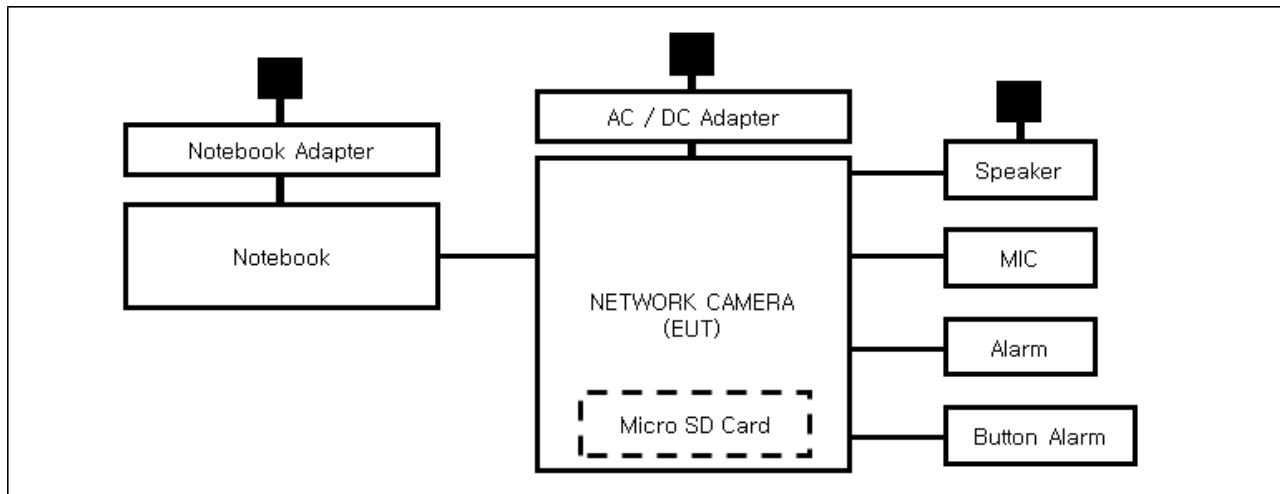
| EUT Test operating S/W |         |                        |
|------------------------|---------|------------------------|
| Name                   | Version | Manufacture Company    |
| Web Viewer             | -       | Hanwha Vision Co., Ltd |

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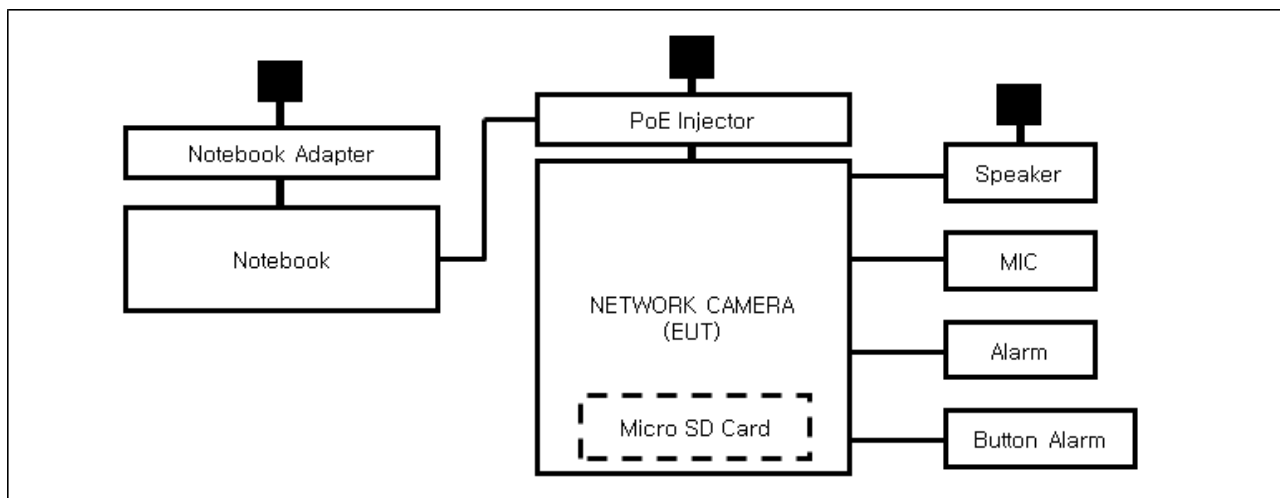
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

USB, VIDEO port are for administrator use and is excluded from testing.

## 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                     |



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## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR32:2015**

☒ Class A

☐ Class B

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## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Jan. 03, 2022

### 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        | 12, 28, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 12, 27, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 12, 27, 2022 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 12, 27, 2022 |

### Test Conditions

Temperature: (22,8 ± 0,0) °C

Relative Humidity: (44,3 ± 0,0) % 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

Jan. 03, 2022

### 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        | 12, 28, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 12, 27, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 12, 27, 2022 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 12, 27, 2022 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 12, 28, 2022 |
| <input type="checkbox"/>            | CDN               | CDNS502A     | TESEQ        | 40431         | 12, 27, 2022 |

### Test Conditions

Temperature: (22,8 ± 0,0) °C

Relative Humidity: (44,3 ± 0,0) % 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

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

### Test Date

Jan. 03, 2022

### 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, 24, 2022 |
| <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: (22,6 ± 0,1) °C

Relative Humidity: (43,1 ± 0,1) % 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, 2022

### 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, 03, 2022 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 04, 07, 2022 |
| <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: (22,7 ± 0,1) °C

Relative Humidity: (43,3 ± 0,1) % 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

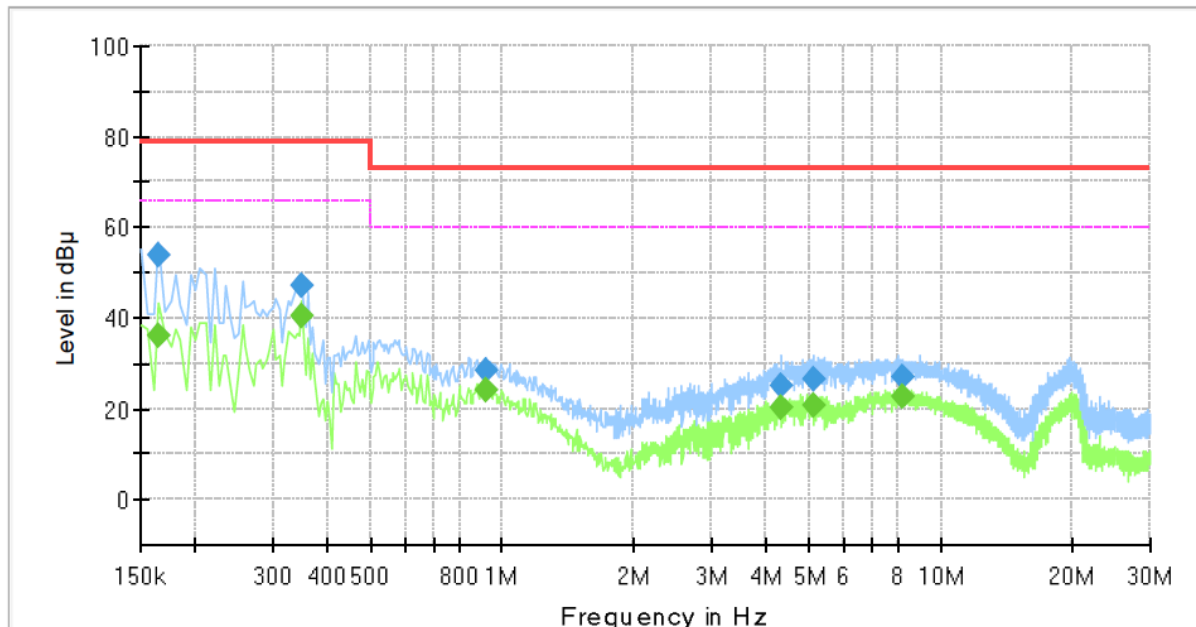
### Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

#### Common Information

|                   |                    |
|-------------------|--------------------|
| Test Description: | Conducted Emission |
| Model No.:        | XNF-8010RVM        |
| 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.165000        | ---              | 36.24           | 66.00        | 29.76       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.165000        | 53.89            | ---             | 79.00        | 25.11       | 1000.0          | 9.000           | L1   | 19.5       |
| 0.350000        | ---              | 40.61           | 66.00        | 25.39       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.350000        | 46.95            | ---             | 79.00        | 32.05       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.920000        | ---              | 24.20           | 60.00        | 35.80       | 1000.0          | 9.000           | L1   | 20.1       |
| 0.920000        | 28.23            | ---             | 73.00        | 44.77       | 1000.0          | 9.000           | L1   | 20.1       |
| 4.310000        | ---              | 20.12           | 60.00        | 39.88       | 1000.0          | 9.000           | L1   | 19.8       |
| 4.310000        | 25.28            | ---             | 73.00        | 47.72       | 1000.0          | 9.000           | L1   | 19.8       |
| 5.130000        | ---              | 20.74           | 60.00        | 39.26       | 1000.0          | 9.000           | L1   | 19.7       |
| 5.130000        | 26.53            | ---             | 73.00        | 46.47       | 1000.0          | 9.000           | L1   | 19.7       |
| 8.200000        | ---              | 22.43           | 60.00        | 37.57       | 1000.0          | 9.000           | L1   | 19.7       |
| 8.200000        | 27.18            | ---             | 73.00        | 45.82       | 1000.0          | 9.000           | L1   | 19.7       |

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## NEUTRAL LINE

### Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

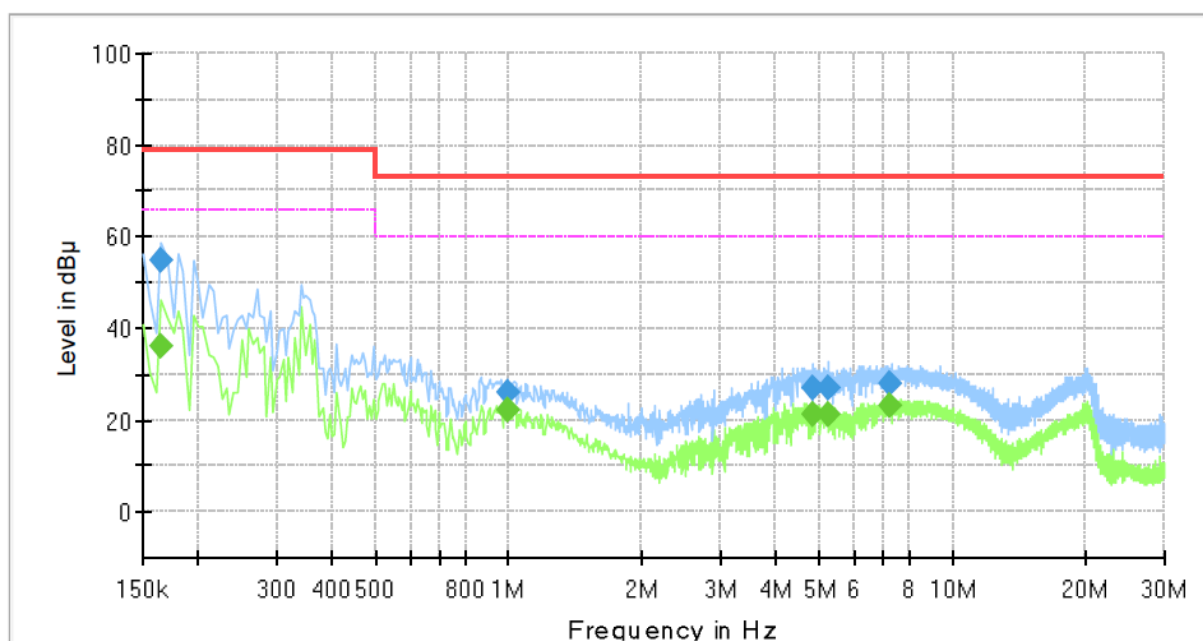
Conducted Emission

XNF-8010RVM

N

DC

KES



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.165000        | ---              | 36.34           | 66.00        | 29.66       | 1000.0          | 9.000           | N    | 19.4       |
| 0.165000        | 54.92            | ---             | 79.00        | 24.08       | 1000.0          | 9.000           | N    | 19.4       |
| 0.995000        | ---              | 21.96           | 60.00        | 38.04       | 1000.0          | 9.000           | N    | 20.1       |
| 0.995000        | 25.97            | ---             | 73.00        | 47.03       | 1000.0          | 9.000           | N    | 20.1       |
| 4.845000        | ---              | 21.15           | 60.00        | 38.85       | 1000.0          | 9.000           | N    | 19.7       |
| 4.845000        | 26.86            | ---             | 73.00        | 46.14       | 1000.0          | 9.000           | N    | 19.7       |
| 5.230000        | ---              | 21.03           | 60.00        | 38.97       | 1000.0          | 9.000           | N    | 19.6       |
| 5.230000        | 26.97            | ---             | 73.00        | 46.03       | 1000.0          | 9.000           | N    | 19.6       |
| 7.180000        | ---              | 22.91           | 60.00        | 37.09       | 1000.0          | 9.000           | N    | 19.6       |
| 7.180000        | 27.88            | ---             | 73.00        | 45.12       | 1000.0          | 9.000           | N    | 19.6       |

#### ◆ 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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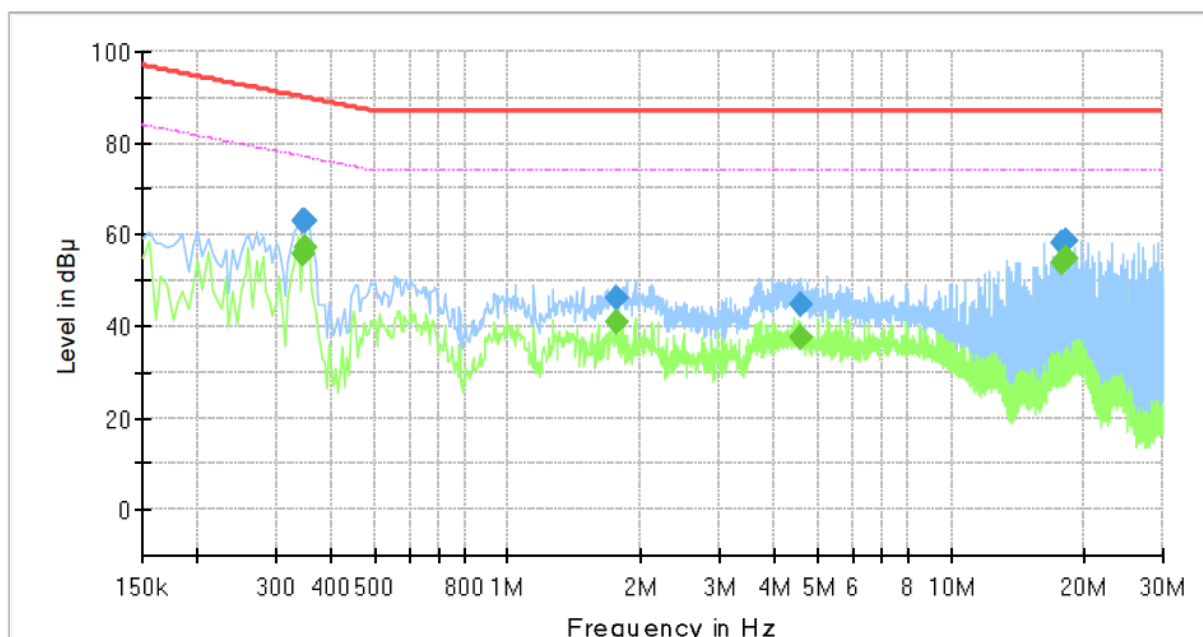
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNF-8010RVM                |
| 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.345000        | ---              | 55.80           | 77.08        | 21.28       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.345000        | 62.80            | ---             | 90.08        | 27.28       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.350000        | ---              | 57.15           | 76.96        | 19.81       | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.350000        | 62.96            | ---             | 89.96        | 27.00       | 1000.0          | 9.000           | Single Line | 19.7       |
| 1.755000        | ---              | 40.73           | 74.00        | 33.27       | 1000.0          | 9.000           | Single Line | 20.2       |
| 1.755000        | 46.08            | ---             | 87.00        | 40.92       | 1000.0          | 9.000           | Single Line | 20.2       |
| 4.580000        | ---              | 37.50           | 74.00        | 36.50       | 1000.0          | 9.000           | Single Line | 19.6       |
| 4.580000        | 44.71            | ---             | 87.00        | 42.29       | 1000.0          | 9.000           | Single Line | 19.6       |
| 17.695000       | ---              | 54.11           | 74.00        | 19.89       | 1000.0          | 9.000           | Single Line | 19.8       |
| 17.695000       | 58.04            | ---             | 87.00        | 28.96       | 1000.0          | 9.000           | Single Line | 19.8       |
| 18.245000       | ---              | 54.96           | 74.00        | 19.04       | 1000.0          | 9.000           | Single Line | 19.9       |
| 18.245000       | 58.73            | ---             | 87.00        | 28.27       | 1000.0          | 9.000           | Single Line | 19.9       |

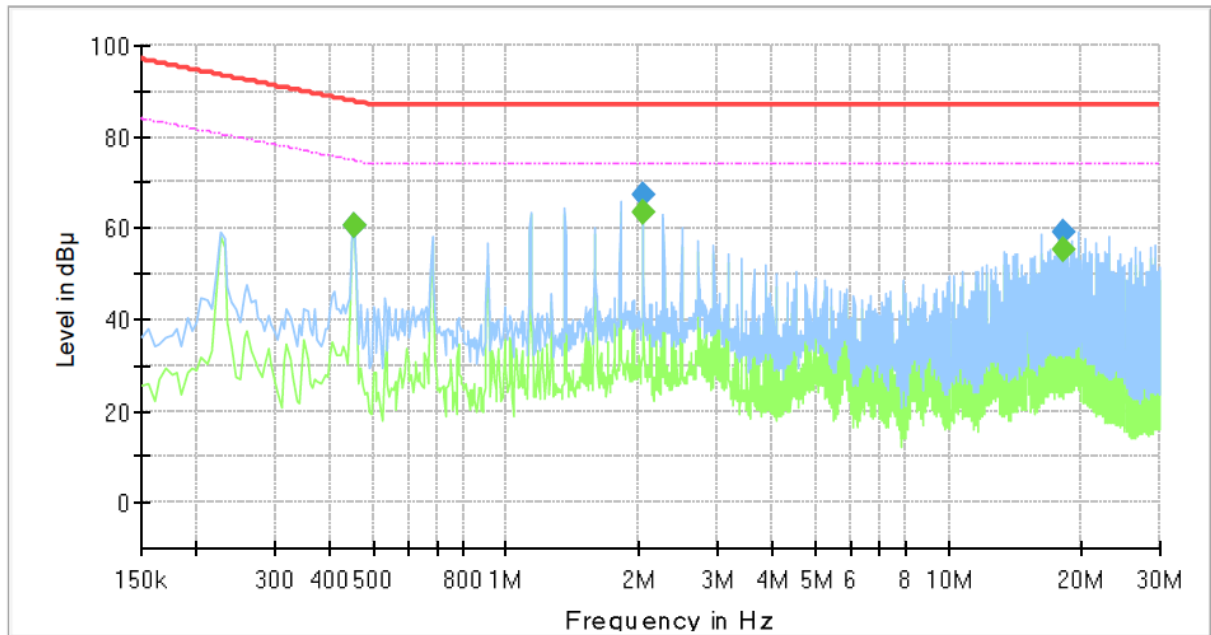
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**PoE Mode**
**[100 Mbps]**
**Common Information**

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | XNF-8010RVM                |
| 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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.455000        | ---              | 60.51           | 74.78        | 14.27       | 1000.0          | 9.000           | Single Line | 19.8       |
| 0.455000        | 60.64            | ---             | 87.78        | 27.14       | 1000.0          | 9.000           | Single Line | 19.8       |
| 2.040000        | ---              | 63.61           | 74.00        | 10.39       | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.040000        | 67.54            | ---             | 87.00        | 19.46       | 1000.0          | 9.000           | Single Line | 20.2       |
| 18.245000       | ---              | 55.41           | 74.00        | 18.59       | 1000.0          | 9.000           | Single Line | 19.9       |
| 18.245000       | 59.16            | ---             | 87.00        | 27.84       | 1000.0          | 9.000           | Single Line | 19.9       |

**◆ 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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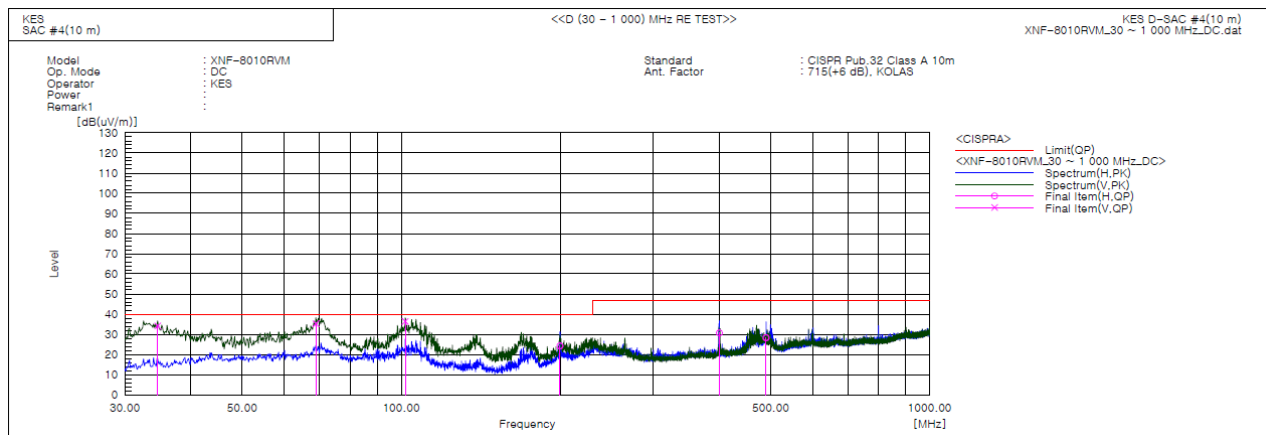
Report No.:

KES-EM-22T0070-R1

Page (21) of (36)

## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode

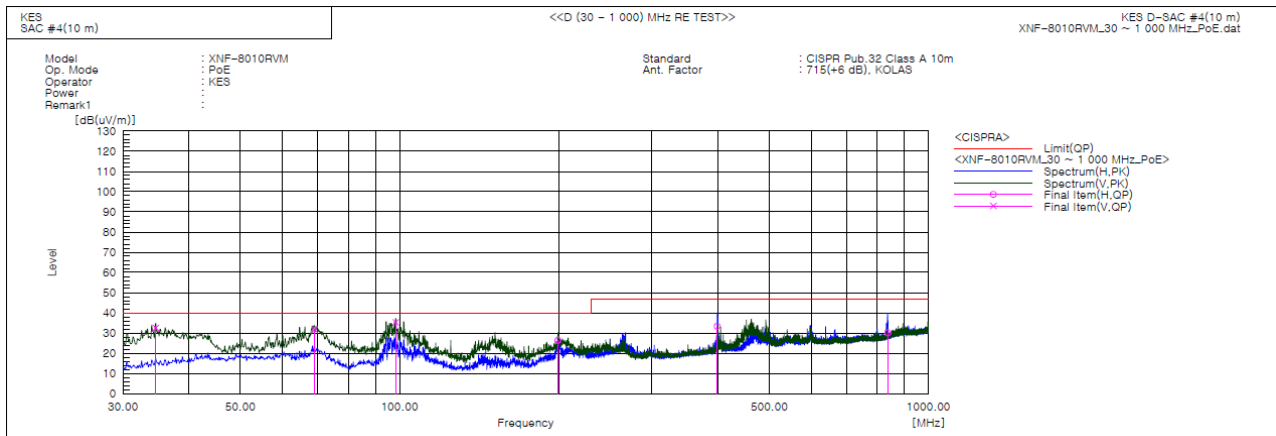


### Final Result

| 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   | 34.608          | V   | 58.7                | -24.5         | 34.2                 | 40.0                | 5.8            | 143.0       | 3.0         |        |
| 2   | 68.921          | V   | 59.6                | -24.3         | 35.3                 | 40.0                | 4.7            | 121.0       | 59.0        |        |
| 3   | 101.780         | V   | 58.8                | -22.4         | 36.4                 | 40.0                | 3.6            | 107.0       | 193.0       |        |
| 4   | 199.629         | H   | 45.1                | -20.8         | 24.3                 | 40.0                | 15.7           | 366.0       | 130.0       |        |
| 5   | 399.813         | H   | 44.8                | -14.1         | 30.7                 | 47.0                | 16.3           | 376.0       | 38.0        |        |
| 6   | 490.144         | H   | 39.9                | -11.6         | 28.3                 | 47.0                | 18.7           | 380.0       | 149.0       |        |

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## ■ PoE 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   | 34.608             | V   | 57.0                      | -24.5            | 32.5                       | 40.0                      | 7.5                  | 147.0          | 7.0            |        |
| 2   | 69.043             | V   | 56.1                      | -24.4            | 31.7                       | 40.0                      | 8.3                  | 115.0          | 112.0          |        |
| 3   | 98.385             | V   | 57.9                      | -22.6            | 35.3                       | 40.0                      | 4.7                  | 122.0          | 240.0          |        |
| 4   | 199.265            | H   | 47.3                      | -20.8            | 26.5                       | 40.0                      | 13.5                 | 380.0          | 90.0           |        |
| 5   | 398.479            | H   | 47.5                      | -14.1            | 33.4                       | 47.0                      | 13.6                 | 356.0          | 202.0          |        |
| 6   | 837.646            | H   | 36.1                      | -5.9             | 30.2                       | 47.0                      | 16.8                 | 392.0          | 192.0          |        |

## ◆ Calculation

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

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

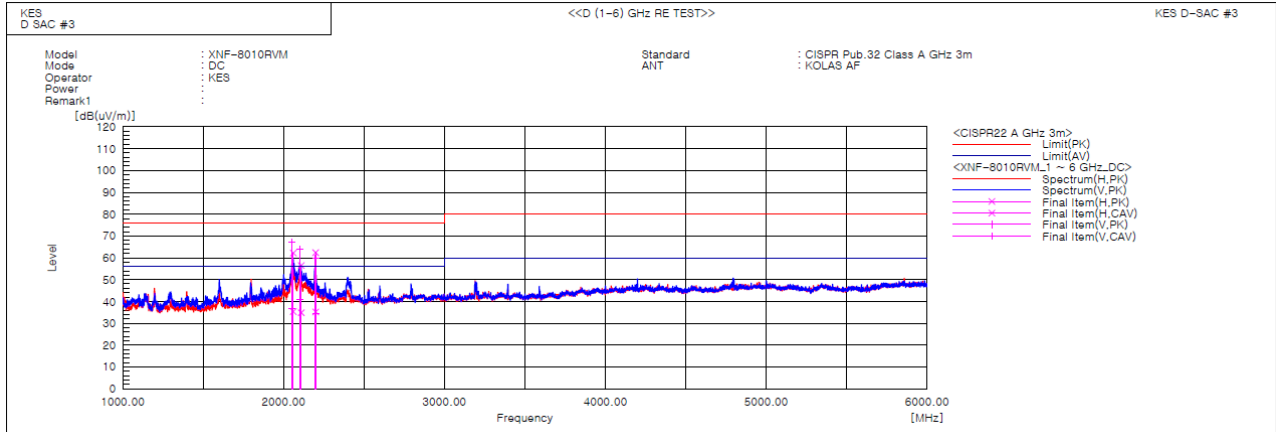
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



## Radiated Electric Field Emissions(Above 1 GHz)

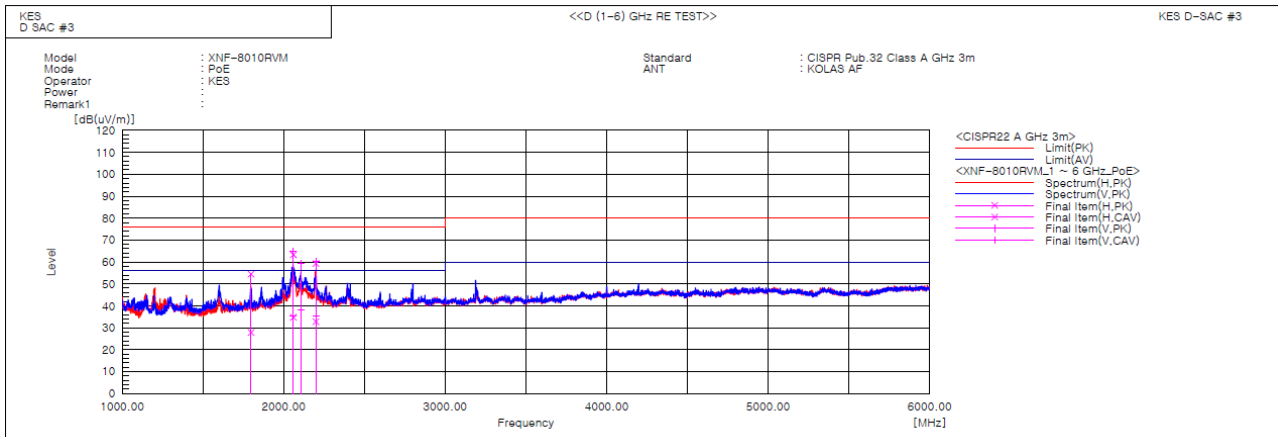
### ■ DC Mode



### 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   | 2053.113        | V   | 68.1                | 37.7                 | -0.8          | 67.3                 | 36.9                  | 76.0                | 56.0                | 8.7            | 19.1            | 100.0       | 1.7         |        |
| 2   | 2059.504        | H   | 63.0                | 36.2                 | -0.8          | 62.2                 | 35.4                  | 76.0                | 56.0                | 13.8           | 20.6            | 100.0       | 321.5       |        |
| 3   | 2101.459        | V   | 64.3                | 41.5                 | -0.6          | 63.7                 | 40.9                  | 76.0                | 56.0                | 12.3           | 15.1            | 100.0       | 4.0         |        |
| 4   | 2108.673        | H   | 57.1                | 35.5                 | -0.6          | 56.5                 | 34.9                  | 76.0                | 56.0                | 19.5           | 21.1            | 100.0       | 55.8        |        |
| 5   | 2197.728        | V   | 60.2                | 34.7                 | -0.4          | 59.8                 | 34.3                  | 76.0                | 56.0                | 16.2           | 21.7            | 100.0       | 202.9       |        |
| 6   | 2199.062        | H   | 62.8                | 35.6                 | -0.4          | 62.4                 | 35.2                  | 76.0                | 56.0                | 13.6           | 20.8            | 100.0       | 34.8        |        |

## PoE 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   | 1797.719        | H   | 57.6                | 30.9                 | -3.1          | 54.5                 | 27.8                  | 76.0                | 56.0                | 21.5           | 28.2            | 100.0       | 163.9       |        |
| 2   | 2057.668        | V   | 65.7                | 36.2                 | -0.8          | 64.9                 | 35.4                  | 76.0                | 56.0                | 11.1           | 20.6            | 100.0       | 343.4       |        |
| 3   | 2059.476        | H   | 64.1                | 35.6                 | -0.8          | 63.3                 | 34.8                  | 76.0                | 56.0                | 12.7           | 21.2            | 100.0       | 19.1        |        |
| 4   | 2106.796        | V   | 59.9                | 38.5                 | -0.6          | 59.3                 | 37.9                  | 76.0                | 56.0                | 16.7           | 18.1            | 100.0       | 356.0       |        |
| 5   | 2198.975        | H   | 59.7                | 33.2                 | -0.4          | 59.3                 | 32.8                  | 76.0                | 56.0                | 16.7           | 23.2            | 100.0       | 339.9       |        |
| 6   | 2200.318        | V   | 60.5                | 35.5                 | -0.4          | 60.1                 | 35.1                  | 76.0                | 56.0                | 15.9           | 20.9            | 100.0       | 356.0       |        |

### 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

## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

#### ■ DC Mode



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**Conducted Emissions at Telecommunication Ports**

## ■ DC Mode



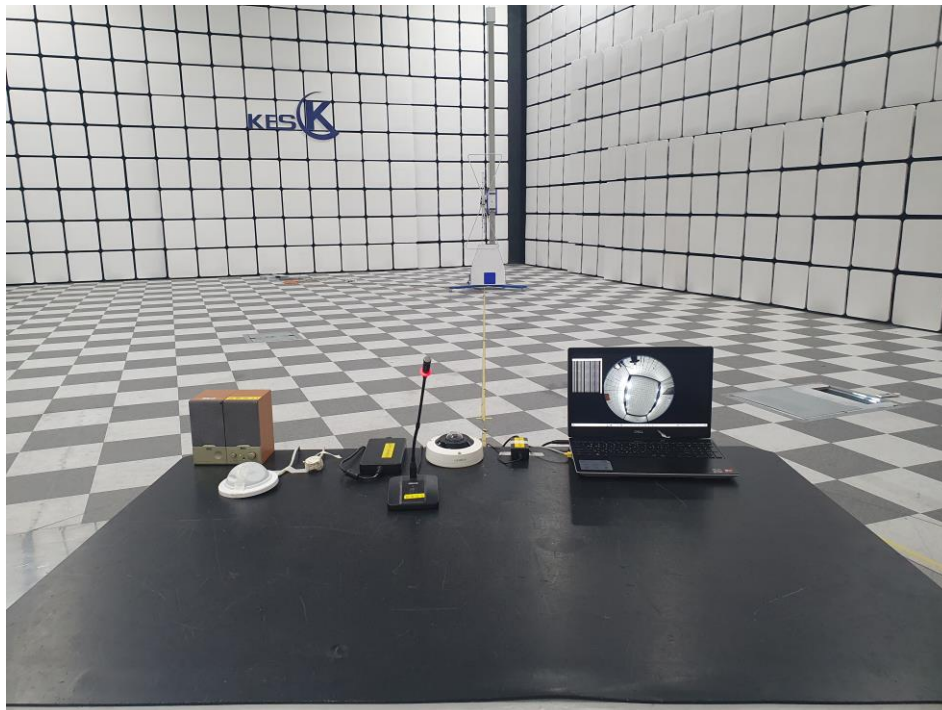
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■ PoE Mode



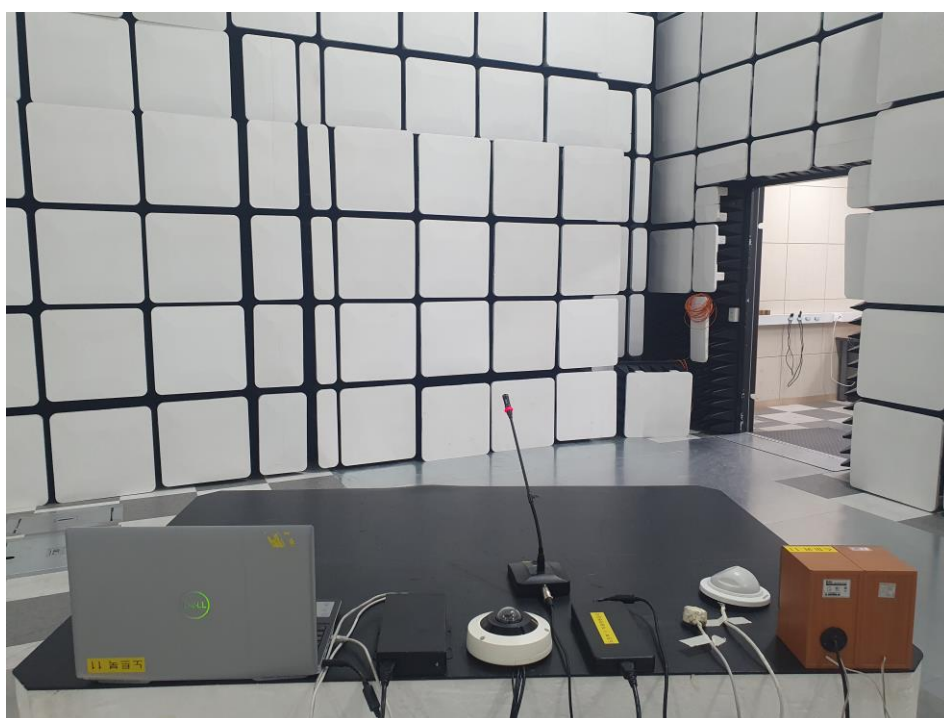
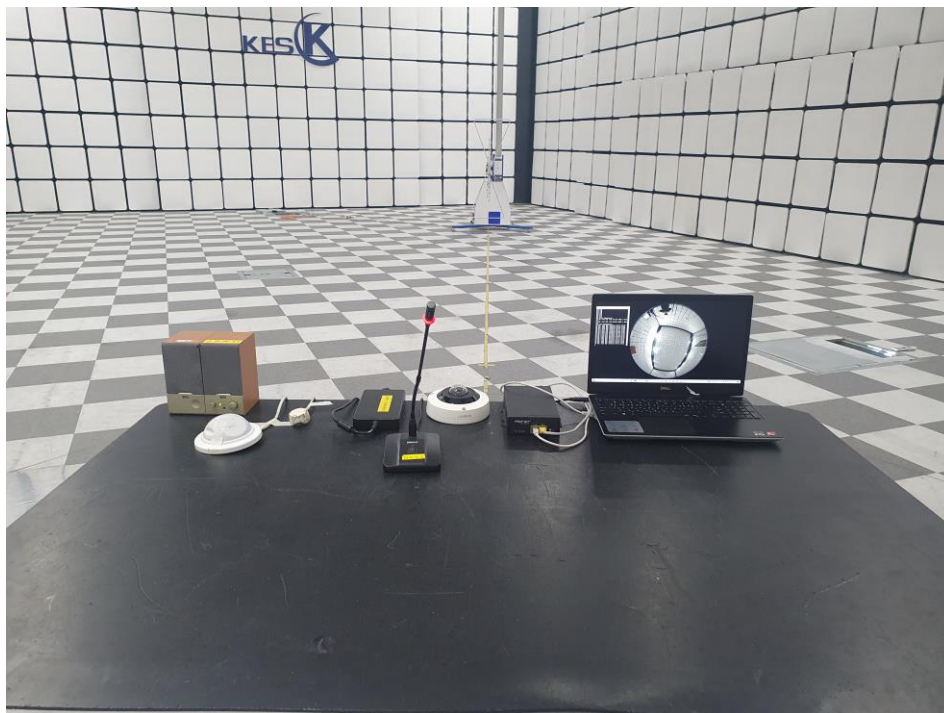
## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



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## ■ PoE Mode



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## 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)

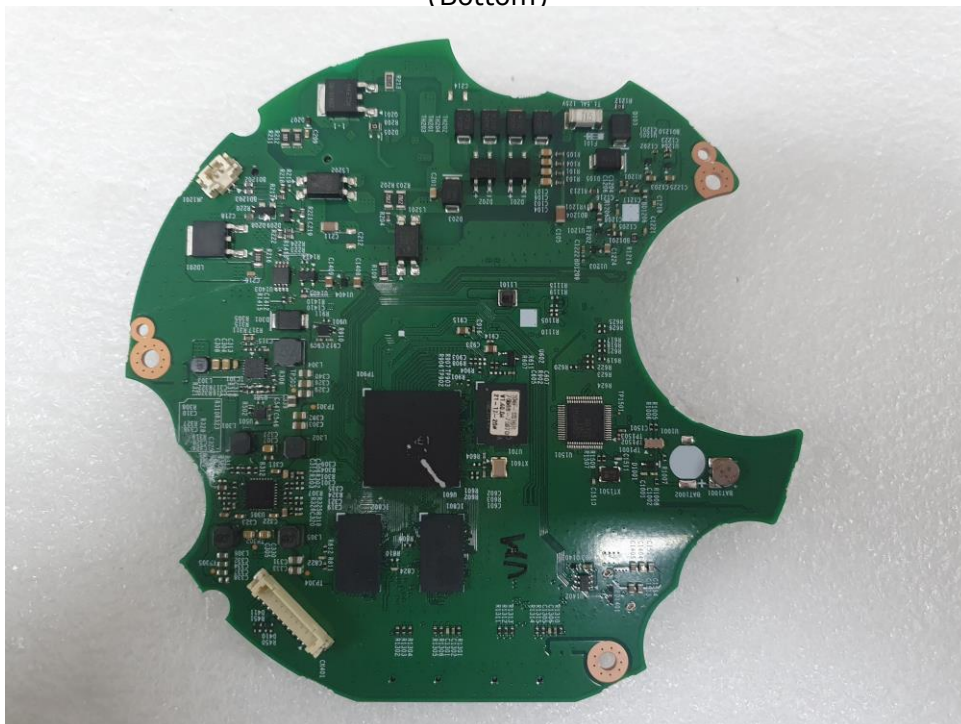


## EUT Internal View – Board 1

(Top)



(Bottom)



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## EUT Internal View – Board 2

(Top)



(Bottom)



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## EUT Internal View – Lens

(Top)



(Bottom)



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