# EMC TEST REPORT For VCCI

| | | |
|---|---|---|
| Test Report No. | : | KES-EM-21T1106 |
| Date of Issue | : | Nov. 22, 2021 |
| Product name | : | Network Video Recorder |
| Model/Type No. | : | QRN-430S |
| Variant Model | : | ARN-410S |
| Applicant | : | Hanwha Techwin Co., Ltd. |
| Applicant Address | : | 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea |
| Manufacturer | : | 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.<br>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<br>2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do, Korea (Suwon Industrial Complex) |
| Date of Receipt | : | Oct. 27, 2021 |
| Test date | : | Nov. 03, 2021 ~ Nov. 04, 2021 |
| Test Results | : | ☒ **In Compliance** ☐ **Not in Compliance** |

*Tested by*

김 세 헌

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.

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# REPORT REVISION HISTORY

| Date | Test Report No. | Revision History |
|---|---|---|
| Nov. 22, 2021 | KES-EM-21T1106 | Issued |
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# 1.0 General Product Description

## Main Specifications of EUT are:

| | | |
|---|---|---|
| **Display** | | |
| Network camera | Inputs | Max. 4CH |
| | Resolution | 8MP ~ CIF |
| | Protocols | SUNAPI, ONVIF |
| Decoding | Local Display | HDMI |
| | Resolution | [Local Monitor]<br>8M(30fps), 1080p(120fps), 720P(120fps), D1(120fps) |
| **Performance** | | |
| Record | Compression | H.265, H.264, MJPEG |
| | Recording Bandwidth | Max. 40Mbps |
| | Resolution | 8MP ~ CIF |
| | Mode | Normal, Dual Stream, Schedule(Continuous/Event), Event (Pre/Post), Bookmark |
| | Event Trigger | Alarm Input, Video Loss, Camera Event(Sensor, MD, Video Analytics, Defocus, Audio), Dynamic Event |
| | Event Action | e-Mail, Event Push, PTZ Preset, Alarm Out, Buzzer, Monitor Out |
| Search & Play | Playback Bandwidth | Max. 32Mbps |
| | User | Max. 4 Users (Local 1, Remote 3) |
| | Simultaneous playback | Max. 16CH(Local 4CH, Remote 4CH per user) |
| | Fisheye Dewarping | CMS |
| Storage | Supported HDD | Up to 6TB |
| | HDD Slot | SATA 1ea(Max. 6TB) |
| Backup | File backup | BU/Exe(GUI), JPG/AVI(Network) |
| | Function | Multi channel(Up to 4CH) Play, Date-Time/Title display |
| **Functions** | | |
| Camera Setup | Item | IP address, Add profile edit, Bitrate, Compression, GOP, Quality, Camera MD setup (4, 8 point polygon)<br>Camera video setup (Simple focus, Brightness/Contrast, Flip/Mirror, IRIS, WDR, D&N, SSNR, Shutter, SSDR, DIS), Fisheye Dewarping Mode, Hallway View Setup, Camera Webpage |
| PTZ | Control | Via GUI, Webviewer |
| Smart phone | Support Model | iOS, Android |
| | Protocol Support | RTP, RTSP, HTTP, CGI(SUNAPI) |
| | Control | Live 4CH(Multi-Profile Support), Playback 4CH |
| | Max. Remote Users | Search(3), Live Unicast(10) |
| Redundancy | Failover | N+1 |
| | ARB | Support |
| Easy configuration | | P2P(QR code) |
| **Interface** | | |
| **HDMI** | | **1EA 3840x2160 30Hz** |

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| | | |
|---|---|---|
| Ethernet | | PoE RJ-45(LAN, 10/100) 4 ea ,RJ-45 1ea (WAN, 10/100) |
| USB | | 2EA(Front 1 x USB 2.0, Rear 1 x USB 2.0) |
| Power inlet | | DC Adaptor |
| **System** | | |
| System Control | | Mouse, Web |
| Language | | English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai, Vietnamese |
| **Environmental** | | |
| Operating Temperature | | 0°C to +40°C(32°F to 104°F) |
| Operating Humidity | | 20% ~ 85% RH |
| **Electrical** | | |
| Power Input | | 100 ~ 240 VAC ±10%; 50/60 Hz |
| Power Consumption | | Max 52W(1HDD, PoE On) |
| PoE Budget | | 35W |
| **Mechanical** | | |
| Color / Material | | Black / Metal |
| Dimension (WxHxD) | | 300.0 x 47.1 x 208.4 mm (11.81 x 1.85 x 8.20 inch) |
| Weight | | 1.03Kg (2.27lb) |
| **Network** | | |
| Protocol | | IPv4, IPv6, TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client) |
| DDNS | | Hanwha DDNS |
| Transmission Bandwidth | | Max. 50Mbps |
| Audio | Input/Output | 4 CH(network) |
| | Compression | G.711, G.726, AAC(16/48KHz) |
| | Audio Communication | 2-Way |
| Max Remote Users | | Search(3), Live Unicast(10), Multicast(20) |
| Security | | IP address filtering, User access Log, 802.1x, Encryption<br>Device certificate(Hanwha Techwin Root CA), Signed firmware |
| Viewer Software | | WAVE, SSM, Webviewer, Smart Viewer, Wisenet mobile<br>Support CGI(SUNAPI) for integration to 3'rd party VMS |

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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

## 1.2 Variant Model Differences

Addition of derivative models for place of sale management

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|
| Network Video Recorder | QRN-430S | - | HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. | EUT |
| Mouse | MOKJUO | - | Primax Electronics Ltd. | EUT |
| Adaptor | FSP065-DWAN3 | - | Zhonghan Electronics(Shenzhen) Co.,Ltd | EUT |
| HDD | ST2000VX003 | - | SEAGATE | EUT, 2 TB |

## 1.5 Support Equipments

| Description | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|
| Camera | QND-6080R | - | HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. | - |
| Notebook | P98F004 | 21599158359 | DELL INC. | - |
| Notebook Adaptor | LA240PM190 | - | LITE-ON TECHNOLOGY(CHANGZHOU)CO.,LTD. | - |
| Monitor | 27TN600S | 005KKJCK0532 | LG Electronics | - |
| Monitor Adaptor | LCAP21C | - | LG Electronics | - |
| USB Memory | - | - | Transcend | - |

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## 1.6 External I/O Cabling

| Start | | END | | Cable Spec. | |
|---|---|---|---|---|---|
| **Description** | **I/O Port** | **Description** | **I/O Port** | **Length** | **Shield** |
| Network Video Recorder (EUT) | DC Jack | Adaptor (EUT) | DC Jack | 1.1 | U |
| | USB | Mouse (EUT) | USB | 1.5 | U |
| | LAN | Notebook | LAN | 3.0 | U |
| | PoE | Camera | PoE | 3.0 | U |
| | HDMI | Monitor | HDMI | 1.5 | S |
| | USB | USB Memory | USB | - | - |
| | External Ground | Ground | External Ground | 2.0 | U |
| Monitor | DC Jack | Monitor Adaptor | DC Jack | 1.0 | U |
| Notebook | DC Jack | Notebook Adaptor | DC Jack | 1.2 | U |

* Unshielded=U, Shielded=S

## 1.7 EUT Operating Mode(s)

| 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 Techwin Co., Ltd. |

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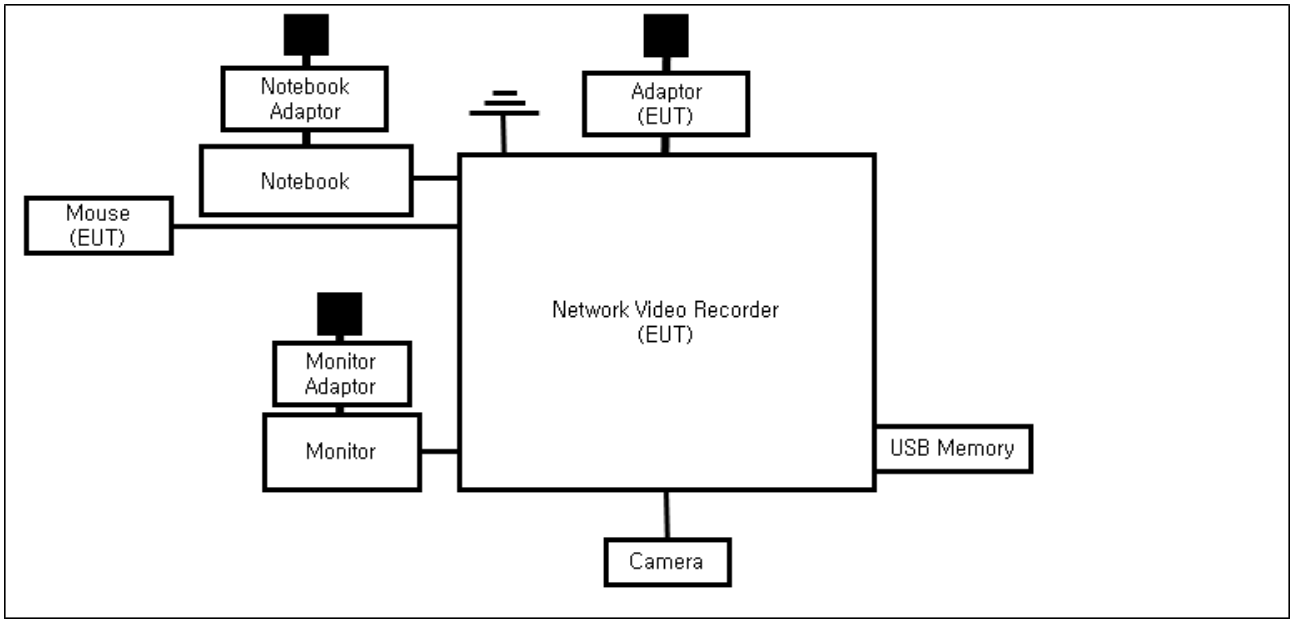
## 1.8 Configuration

■ AC Main
□ DC Main

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## 1.9 Remarks when standards applied

N/A

## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. 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 , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | KR0100 |
| International | **KOLAS** | EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | KT489 |
| USA | **FCC** | 3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements. | KR0100 |
| Canada | **ISED** | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site | 23298-1 |
| JAPAN | **VCCI** | Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz | R-20056, C-20036, T-20040, G-20057 |
| Europe | **TÜV SÜD** | EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | CARAT 001633 0004 |

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# 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016** ☒ Class A ☐ Class B

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# 2.1 Conducted Emissions Mains Power Ports

**Test Date**
Nov. 03, 2021

**Test Location**
Electro wave Shieldroom #6

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EMC32 | R & S | 9.12.00 | - |
| ☒ | EMI TEST RECEIVER | ESR3 | R & S | 101783 | 01, 15, 2022 |
| ☒ | LISN | ENV216 | R & S | 101787 | 12, 29, 2021 |
| ☒ | LISN | ESH2-Z5 | R & S | 100450 | 12, 29, 2021 |
| ☒ | PULSE LIMITER | ESH3-Z2 | R & S | 101915 | 12, 29, 2021 |

**Test Conditions**
Temperature: (22,5 ± 0,1) ℃
Relative Humidity: (44,0 ± 0,0) % R.H.

**Frequency Range of Measurement**
150 ㎑ to 30 ㎒

**Instrument Settings**
IF Band Width: 9 ㎑

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

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## 2.2 Conducted Emissions at Telecommunication Ports

**Test Date**
Nov. 03, 2021

**Test Location**
Electro wave Shieldroom #6

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EMC32 | R & S | 9.12.00 | - |
| ☒ | EMI TEST RECEIVER | ESR3 | R & S | 101783 | 01, 15, 2022 |
| ☒ | LISN | ENV216 | R & S | 101787 | 12, 29, 2021 |
| ☒ | LISN | ESH2-Z5 | R & S | 100450 | 12, 29, 2021 |
| ☒ | PULSE LIMITER | ESH3-Z2 | R & S | 101915 | 12, 29, 2021 |
| ☒ | 8-WIRE ISN CAT3,5 | ENY81 | R & S | 100174 | 12, 30, 2021 |
| ☐ | 8-WIRE ISN CAT6 | ENY81-CAT6 | R & S | 101665 | 12, 30, 2021 |
| ☐ | CDN | CDNS502A | TESEQ | 40431 | 12, 29, 2021 |

**Test Conditions**
Temperature: (22,5 ± 0,1) ℃
Relative Humidity: (43,8 ± 0,2) % R.H.

**Frequency Range of Measurement**
150 ㎑ to 30 ㎒

**Instrument Settings**
IF Band Width: 9 ㎑

**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.

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# 2.3 Radiated Electric Field Emissions(Below 1 ㎓)

**Test Date**
Nov. 03, 2021

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

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EP5/RE | TOYO Corporation | 6.0.0 | - |
| ☒ | EMI TEST RECEIVER | ESU26 | R & S | 100551 | 04, 01, 2022 |
| ☒ | AMPLIFIER | SCU 01 | R & S | 100603 | 11, 25, 2021 |
| ☒ | TRILOG-BROADBAND ANTENNA | VULB9163 | Schwarzbeck | 715 | 12, 08, 2022 |
| ☒ | ATTENUATOR | 8491A | HP | 32173 | 03, 10, 2022 |

**Test Conditions**
Temperature: (22,9 ± 0,1) ℃
Relative Humidity: (44,8 ± 0,1) % R.H.

**Frequency Range of Measurement**
30 ㎒ to 1 ㎓

**Instrument Settings**
IF Band Width: 120 ㎑

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

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# 2.4 Radiated Electric Field Emissions(Above 1 ㎓)

**Test Date**
Nov. 04, 2021

**Test Location**
SEMI ANECHOIC CHAMBER #3

**Test Equipment**

| Used | Description | Model Number | Manufacturer | Serial Number | Cal. Due |
|---|---|---|---|---|---|
| ☒ | EMI Test S/W | EP5/RE | TOYO Corporation | 6.0.0 | - |
| ☒ | EMI TEST RECEIVER | ESR7 | R & S | 101190 | 08, 03, 2022 |
| ☒ | PREAMPLIFIER | 8449B | AGILENT | 3008A01967 | 04, 07, 2022 |
| ☐ | ATTENUATOR | 8491A | HP | 35496 | 03, 10, 2022 |
| ☒ | DOUBLE RIDGED HORN ANTENNA | SAS-571 | A.H.SYSTEM,INC | 781 | 03, 11, 2022 |

**Test Conditions**
Temperature: (22,9 ± 0,1) ℃
Relative Humidity: (44,9 ± 0,0) % R.H.

**Frequency Range of Measurement**
1 ㎓ to 6 ㎓

**Instrument Settings**
IF Band Width: 1 ㎒

**Test Results**
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

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

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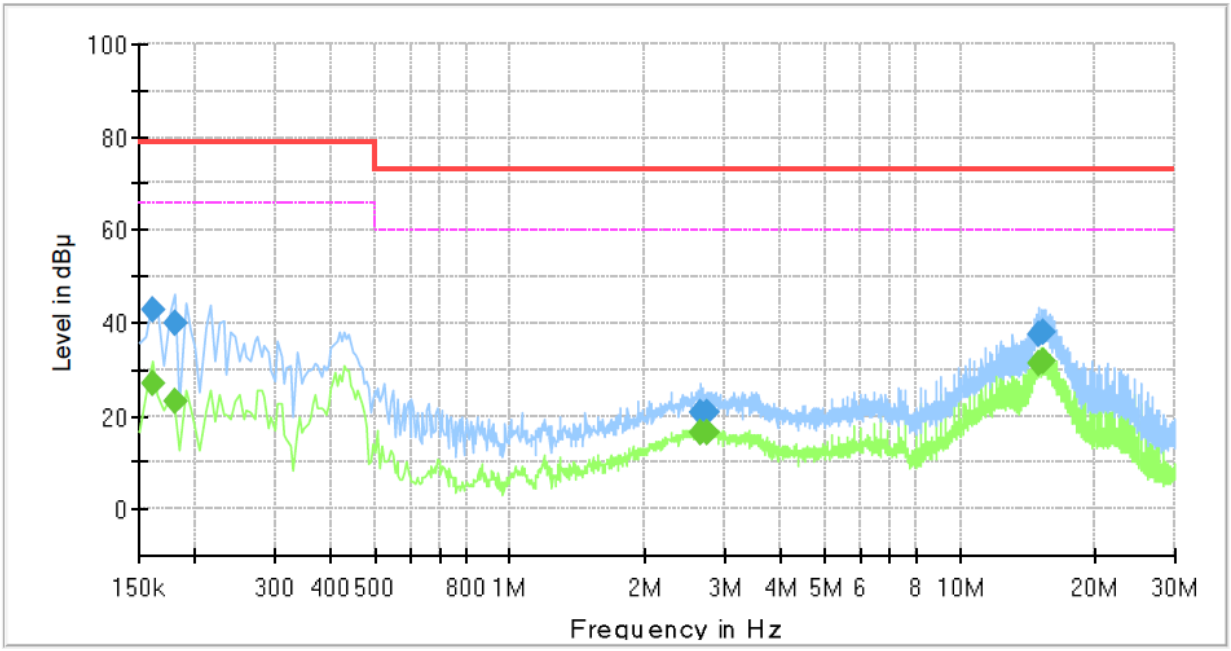
# APPENDIX A – TEST DATA

## Conducted Emissions at Mains Power Ports

HOT LINE

## Common Information

| | |
|---|---|
| Test Description: | Conducted Emission |
| Model No.: | QRN-430S |
| Phase: | L1 |
| Mode: | |
| Operator Name: | KES |




## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.160000 | --- | 27.11 | 66.00 | 38.89 | 1000.0 | 9.000 | L1 | 19.5 |
| 0.160000 | 42.83 | --- | 79.00 | 36.17 | 1000.0 | 9.000 | L1 | 19.5 |
| 0.180000 | --- | 23.12 | 66.00 | 42.88 | 1000.0 | 9.000 | L1 | 19.5 |
| 0.180000 | 39.87 | --- | 79.00 | 39.13 | 1000.0 | 9.000 | L1 | 19.5 |
| 2.650000 | --- | 16.48 | 60.00 | 43.52 | 1000.0 | 9.000 | L1 | 20.2 |
| 2.650000 | 20.73 | --- | 73.00 | 52.27 | 1000.0 | 9.000 | L1 | 20.2 |
| 2.745000 | --- | 16.59 | 60.00 | 43.41 | 1000.0 | 9.000 | L1 | 20.2 |
| 2.745000 | 20.92 | --- | 73.00 | 52.08 | 1000.0 | 9.000 | L1 | 20.2 |
| 15.020000 | --- | 31.52 | 60.00 | 28.48 | 1000.0 | 9.000 | L1 | 19.9 |
| 15.020000 | 37.67 | --- | 73.00 | 35.33 | 1000.0 | 9.000 | L1 | 19.9 |
| 15.385000 | --- | 31.87 | 60.00 | 28.13 | 1000.0 | 9.000 | L1 | 19.9 |
| 15.385000 | 37.92 | --- | 73.00 | 35.08 | 1000.0 | 9.000 | L1 | 19.9 |

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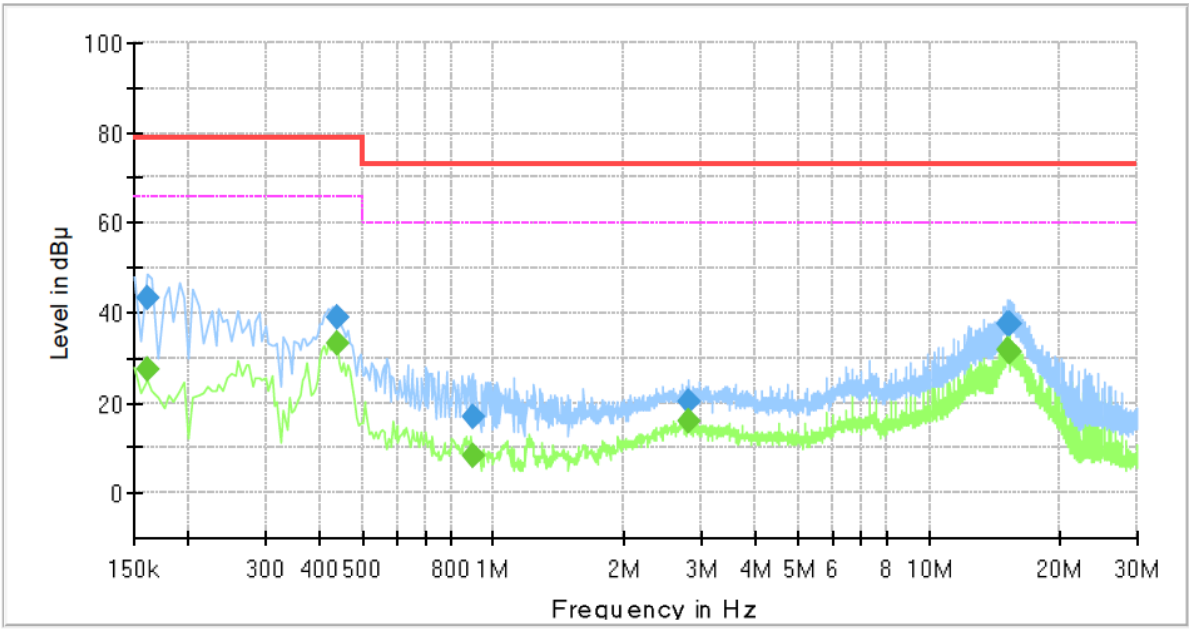
NEUTRAL LINE

## Common Information

| | |
|---|---|
| Test Description: | Conducted Emission |
| Model No.: | QRN-430S |
| Phase: | N |
| Mode: | |
| Operator Name: | KES |




## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.160000 | --- | 27.57 | 66.00 | 38.43 | 1000.0 | 9.000 | N | 19.4 |
| 0.160000 | 43.32 | --- | 79.00 | 35.68 | 1000.0 | 9.000 | N | 19.4 |
| 0.440000 | --- | 33.27 | 66.00 | 32.73 | 1000.0 | 9.000 | N | 19.7 |
| 0.440000 | 38.82 | --- | 79.00 | 40.18 | 1000.0 | 9.000 | N | 19.7 |
| 0.895000 | --- | 8.34 | 60.00 | 51.66 | 1000.0 | 9.000 | N | 20.1 |
| 0.895000 | 17.00 | --- | 73.00 | 56.00 | 1000.0 | 9.000 | N | 20.1 |
| 2.800000 | --- | 15.90 | 60.00 | 44.10 | 1000.0 | 9.000 | N | 20.2 |
| 2.800000 | 20.21 | --- | 73.00 | 52.79 | 1000.0 | 9.000 | N | 20.2 |
| 15.225000 | --- | 31.62 | 60.00 | 28.38 | 1000.0 | 9.000 | N | 19.9 |
| 15.225000 | 37.68 | --- | 73.00 | 35.32 | 1000.0 | 9.000 | N | 19.9 |
| 15.385000 | --- | 31.50 | 60.00 | 28.50 | 1000.0 | 9.000 | N | 19.9 |
| 15.385000 | 37.53 | --- | 73.00 | 35.47 | 1000.0 | 9.000 | N | 19.9 |

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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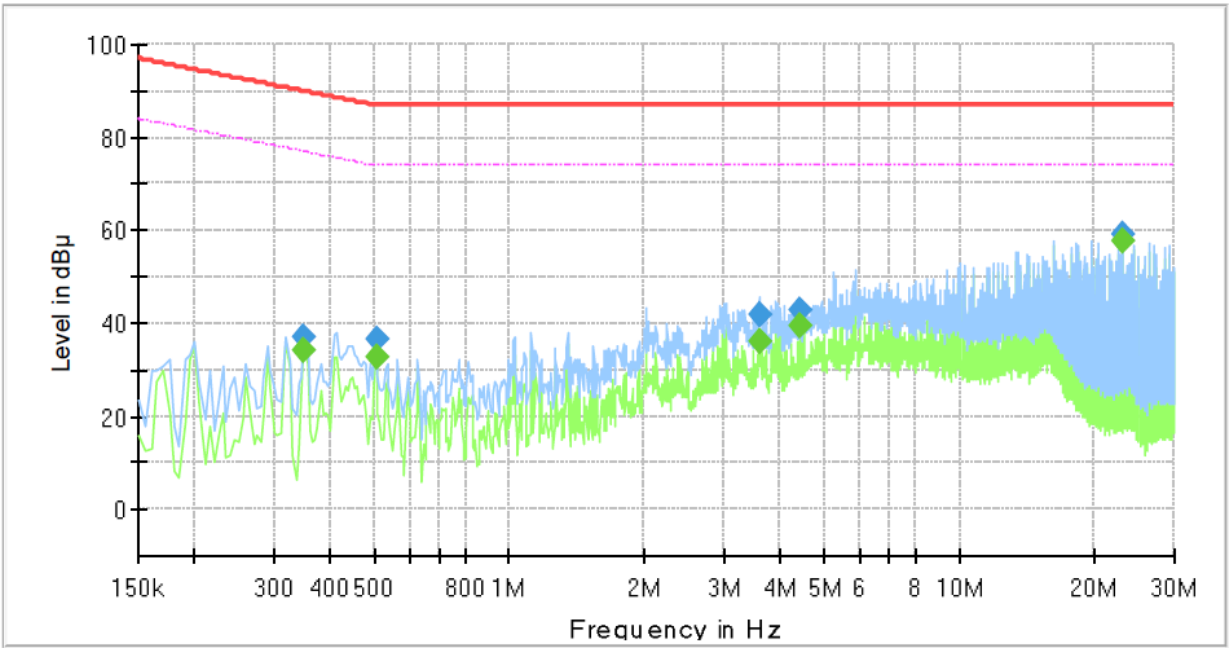
# Conducted Emissions at Telecommunication Ports

■ LAN

**[100 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QRN-430S |
| Mode : | LAN |
| 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) |
|---|---|---|---|---|---|---|---|---|
| 0.350000 | --- | 34.07 | 76.96 | 42.89 | 1000.0 | 9.000 | Single Line | 19.7 |
| 0.350000 | 36.91 | --- | 89.96 | 53.05 | 1000.0 | 9.000 | Single Line | 19.7 |
| 0.505000 | --- | 32.58 | 74.00 | 41.42 | 1000.0 | 9.000 | Single Line | 19.8 |
| 0.505000 | 36.76 | --- | 87.00 | 50.24 | 1000.0 | 9.000 | Single Line | 19.8 |
| 3.585000 | --- | 36.20 | 74.00 | 37.80 | 1000.0 | 9.000 | Single Line | 19.9 |
| 3.585000 | 41.75 | --- | 87.00 | 45.25 | 1000.0 | 9.000 | Single Line | 19.9 |
| 4.410000 | --- | 39.39 | 74.00 | 34.61 | 1000.0 | 9.000 | Single Line | 19.7 |
| 4.410000 | 42.79 | --- | 87.00 | 44.21 | 1000.0 | 9.000 | Single Line | 19.7 |
| 23.130000 | --- | 57.61 | 74.00 | 16.39 | 1000.0 | 9.000 | Single Line | 20.2 |
| 23.130000 | 59.39 | --- | 87.00 | 27.61 | 1000.0 | 9.000 | Single Line | 20.2 |

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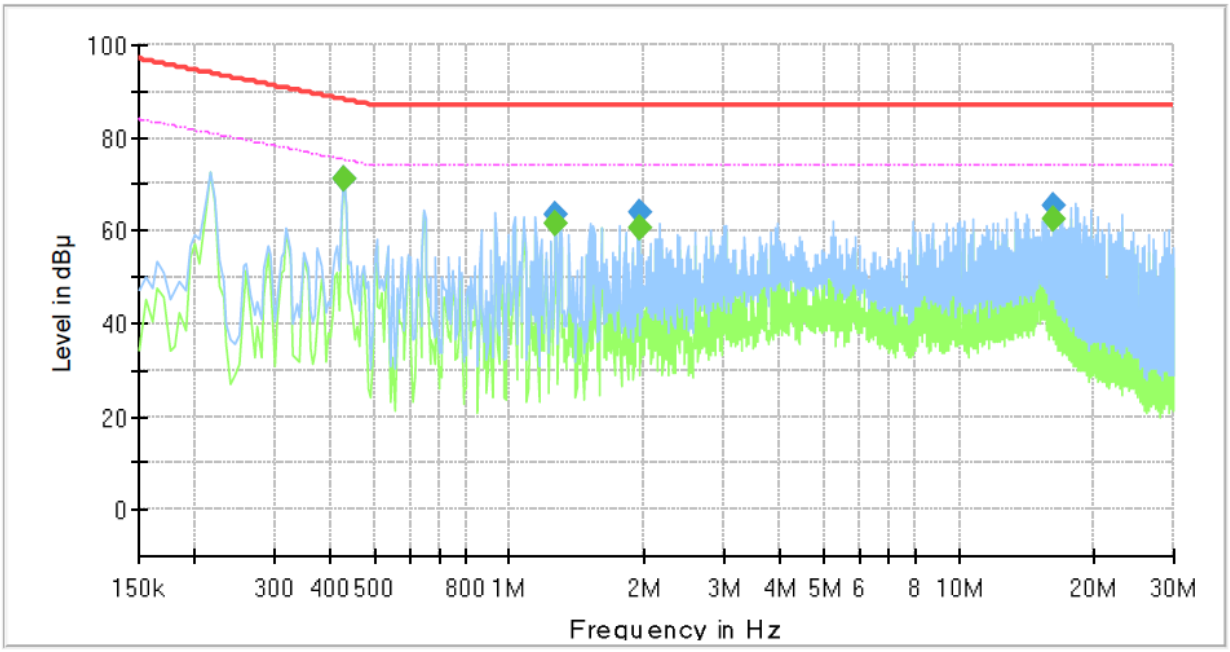
■ PoE

**[100 Mbps]**

## Common Information

| | |
|---|---|
| Test Description: | Telecommunication Emission |
| Model No.: | QRN-430S |
| 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) |
|---|---|---|---|---|---|---|---|---|
| 0.430000 | --- | 71.11 | 75.25 | 4.14 | 1000.0 | 9.000 | Single Line | 19.8 |
| 0.430000 | 71.19 | --- | 88.25 | 17.06 | 1000.0 | 9.000 | Single Line | 19.8 |
| 1.265000 | --- | 61.78 | 74.00 | 12.22 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.265000 | 63.50 | --- | 87.00 | 23.50 | 1000.0 | 9.000 | Single Line | 20.1 |
| 1.940000 | --- | 60.47 | 74.00 | 13.53 | 1000.0 | 9.000 | Single Line | 20.2 |
| 1.940000 | 64.08 | --- | 87.00 | 22.92 | 1000.0 | 9.000 | Single Line | 20.2 |
| 16.230000 | --- | 62.43 | 74.00 | 11.57 | 1000.0 | 9.000 | Single Line | 19.8 |
| 16.230000 | 65.52 | --- | 87.00 | 21.48 | 1000.0 | 9.000 | Single Line | 19.8 |

♦ Calculation
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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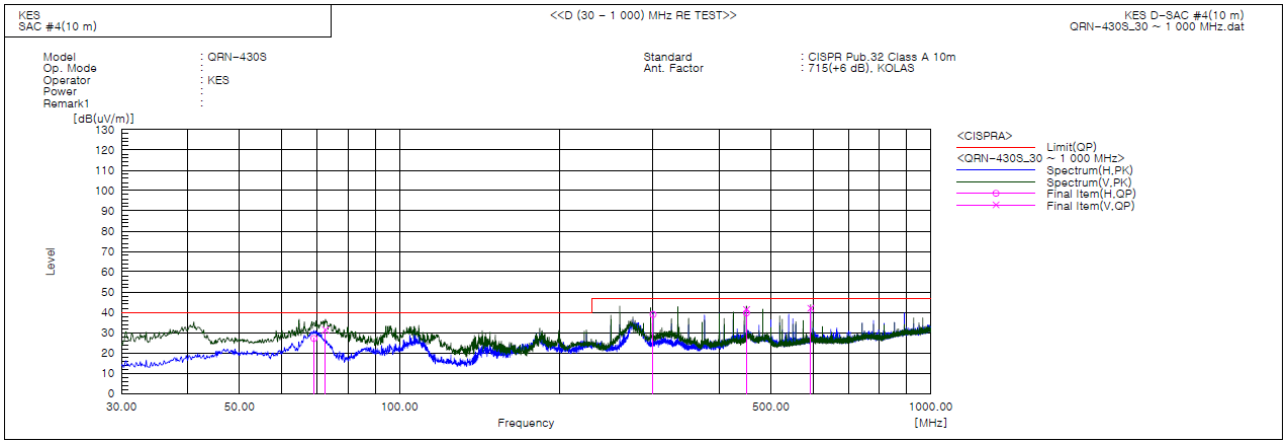
## Radiated Electric Field Emissions(Below 1 ㎓)




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 | 69.043 | H | 51.7 | -24.6 | 27.1 | 40.0 | 12.9 | 367.0 | 136.0 | |
| 2 | 72.559 | V | 57.4 | -26.0 | 31.4 | 40.0 | 8.6 | 145.0 | 74.0 | |
| 3 | 300.024 | H | 56.8 | -17.9 | 38.9 | 47.0 | 8.1 | 381.0 | 294.0 | |
| 4 | 450.010 | H | 52.9 | -13.2 | 39.7 | 47.0 | 7.3 | 394.0 | 294.0 | |
| 5 | 450.010 | V | 54.6 | -13.2 | 41.4 | 47.0 | 5.6 | 139.0 | 138.0 | |
| 6 | 594.055 | V | 50.6 | -8.6 | 42.0 | 47.0 | 5.0 | 111.0 | 101.0 | |

♦ Calculation
Corrected Amplitude [㏈uV] = Amplitude[㏈uV] + Correction Factor [㏈]
Corrected Amplitude : The Final Value, Amplitude : Reading Value,
Correction Factor : ANT FACTOR + Cable loss

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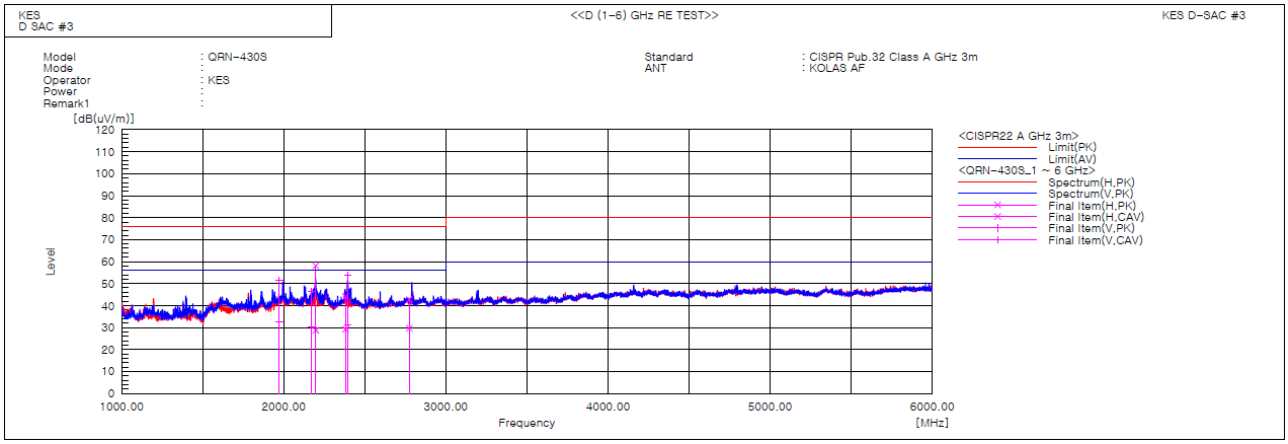
## Radiated Electric Field Emissions(Above 1 ㎓)




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 | 1971.914 | V | 52.7 | 33.7 | -1.2 | 51.5 | 32.5 | 76.0 | 56.0 | 24.5 | 23.5 | 100.0 | 220.1 | |
| 2 | 2172.075 | V | 46.8 | 31.0 | -0.5 | 46.3 | 30.5 | 76.0 | 56.0 | 29.7 | 25.5 | 100.0 | 180.8 | |
| 3 | 2196.229 | H | 58.5 | 29.1 | -0.4 | 58.1 | 28.7 | 76.0 | 56.0 | 17.9 | 27.3 | 100.0 | 225.0 | |
| 4 | 2380.373 | H | 43.9 | 29.0 | 0.2 | 44.1 | 29.2 | 76.0 | 56.0 | 31.9 | 26.8 | 100.0 | 262.9 | |
| 5 | 2396.220 | V | 53.6 | 31.1 | 0.2 | 53.8 | 31.3 | 76.0 | 56.0 | 22.2 | 24.7 | 100.0 | 184.1 | |
| 6 | 2773.774 | H | 41.1 | 28.1 | 1.6 | 42.7 | 29.7 | 76.0 | 56.0 | 33.3 | 26.3 | 100.0 | 253.4 | |

♦ Calculation
Result(PK/CAV) [㏈(㎶/m)] = (Reading(PK/CAV)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(PK/CAV)[㏈] = Limit[㏈(㎶/m)] - Result(PK/CAV) [㏈(㎶/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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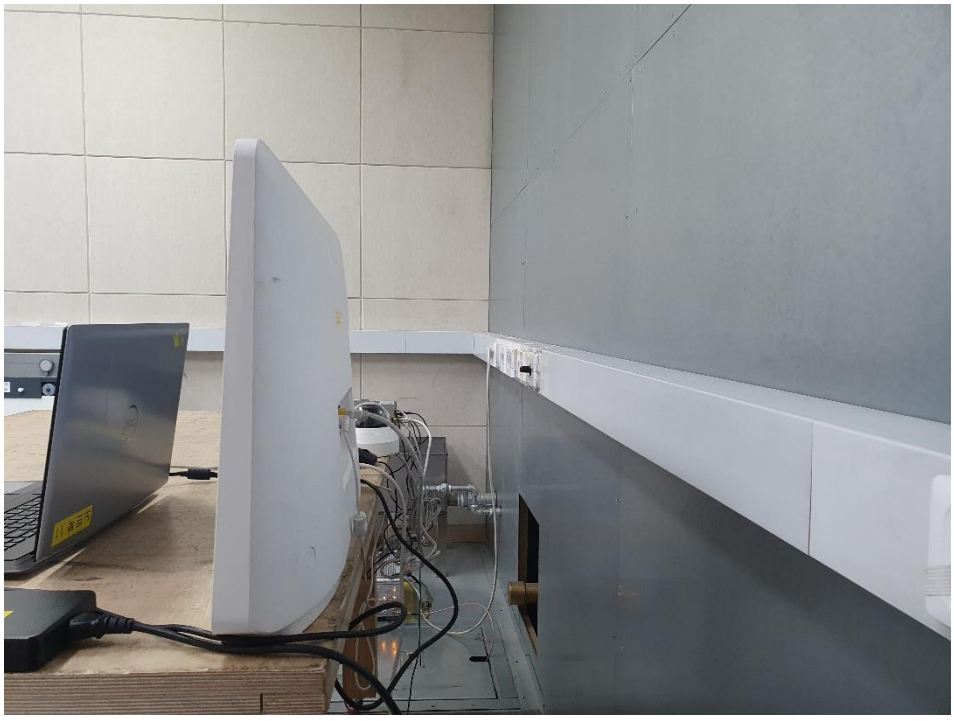
# Test Setup Photos and Configuration

## Conducted Emissions at Mains Power Ports



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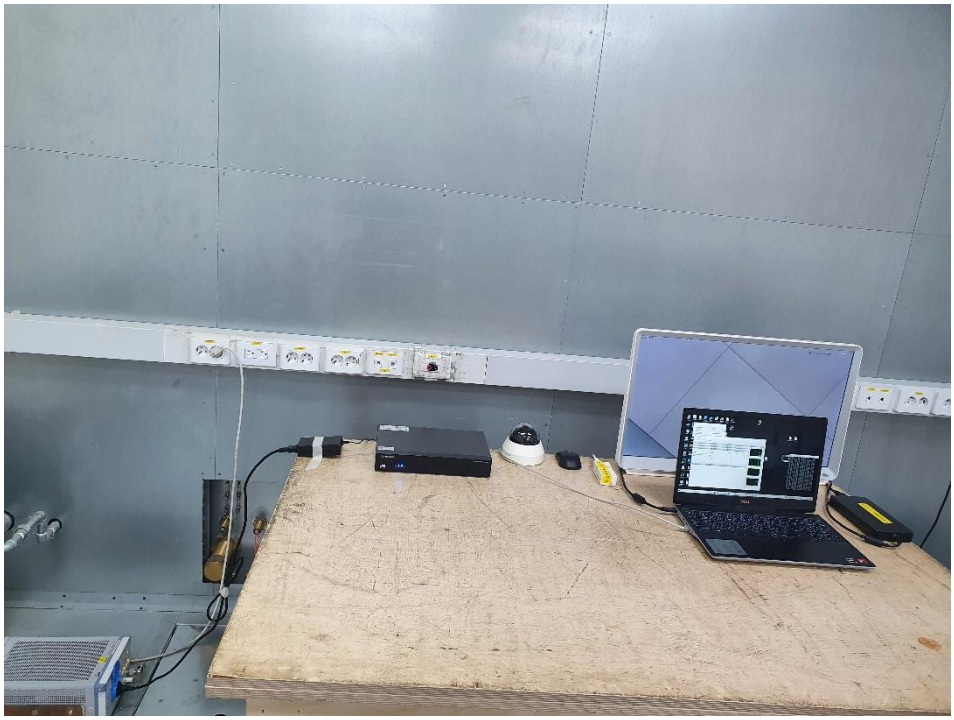
## Conducted Emissions at Telecommunication Ports



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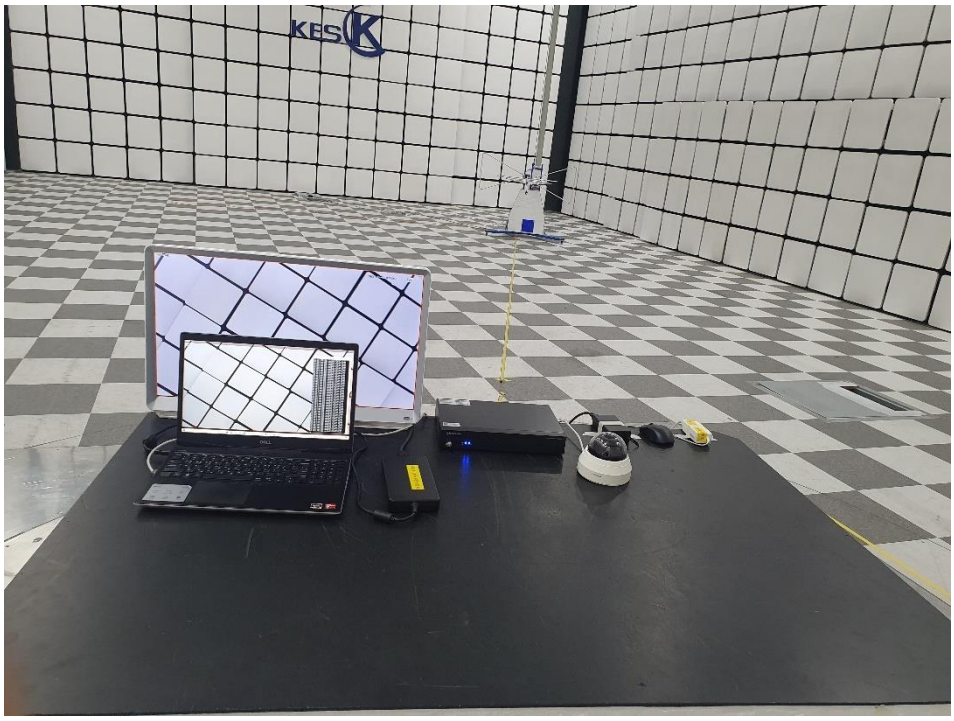
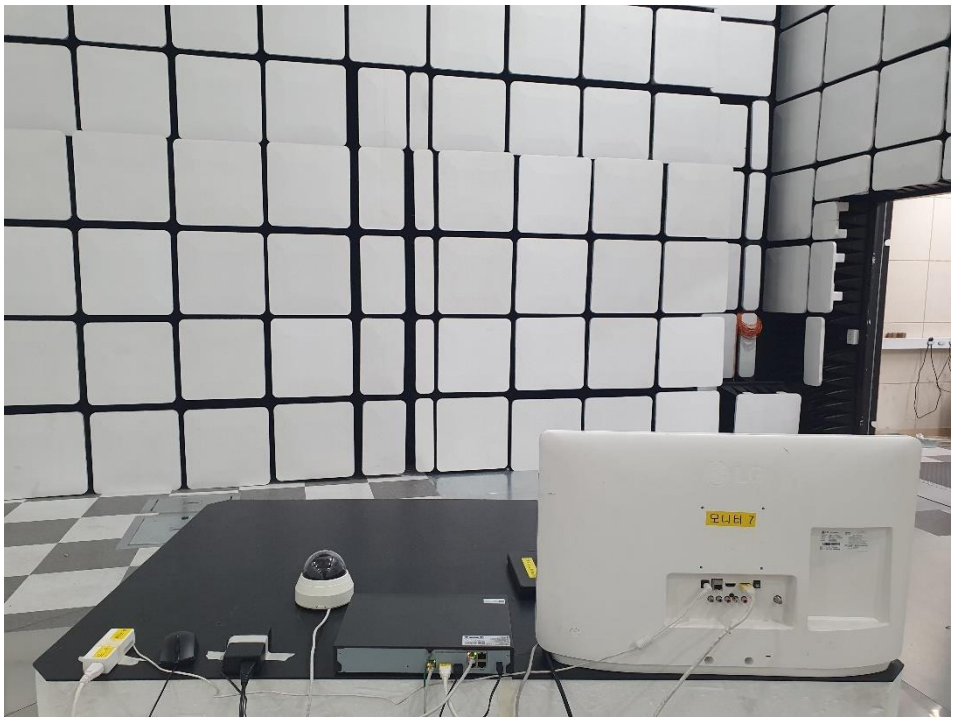
## Radiated Electric Field Emissions(Below 1 ㎓)



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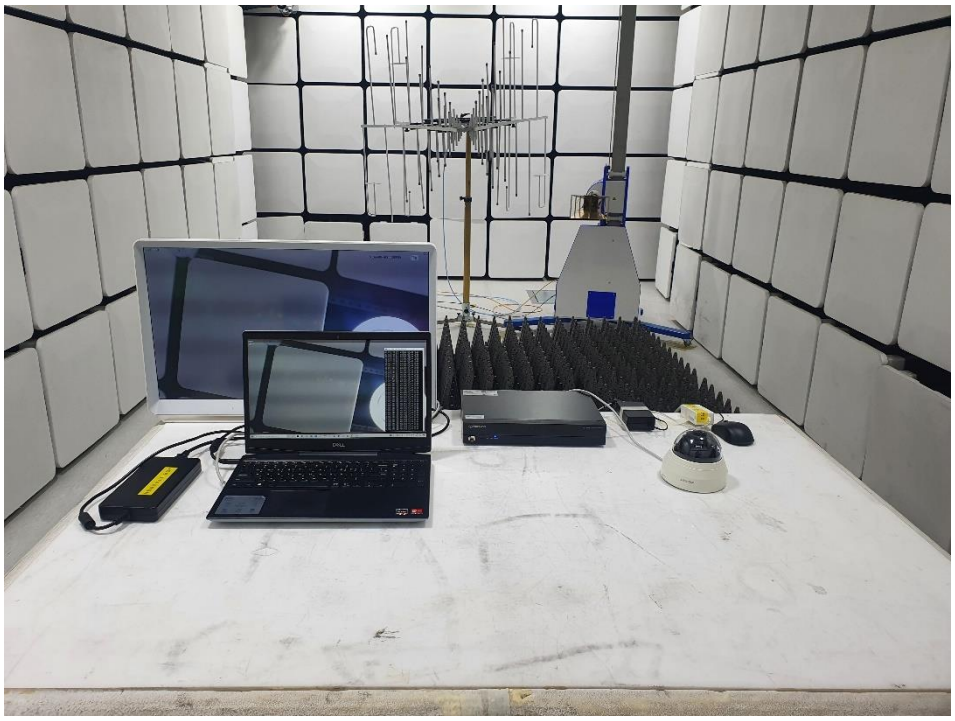
## Radiated Electric Field Emissions(Above 1 ㎓)



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# EUT External Photographs

(Top)

(Bottom)

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# EUT Internal Photographs

(Internal View)

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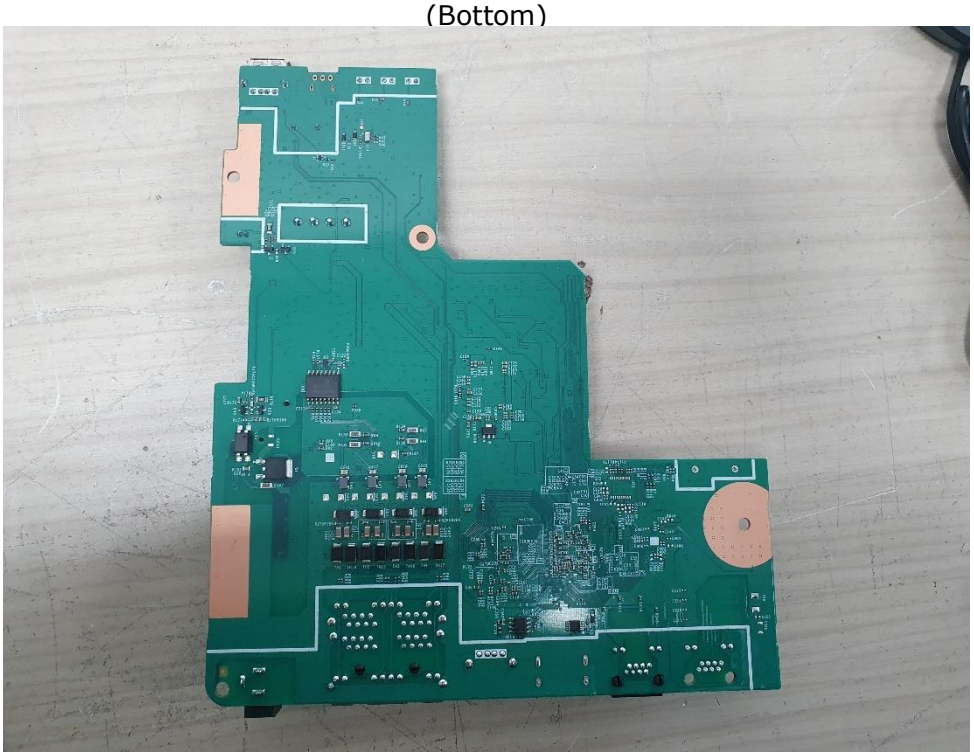
# EUT Internal View – Board

(Top)

(Bottom)



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## EUT Internal View – Mouse

## EUT Internal View – Adaptor

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# EUT Internal View – HDD

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# Label Photographs

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