

**KES Co., Ltd.**

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www.kes.co.kr

Report No.:

KES-EM-21T0587

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# EMC TEST REPORT For RCM

Test Report No. : KES-EM-21T0587  
Date of Issue : Jul. 13, 2021  
Product name : NETWORK CAMERA  
Model/Type No. : XNO-8083R  
Variant Model : -  
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.  
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 : Jun. 15, 2021  
Test date : Jul. 01, 2021 ~ Jul. 04, 2021  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

*Tested by*

Ki Man, 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
Jul. 13, 2021	KES-EM-21T0587	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

<b>Video</b>	
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) MJPEG: Max. 15fps/12fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	(TBD) Color: 0.04Lux(F1.3, 1/30sec, 30IRE) B/W : 0.004Lux(F1.3, 1/30sec, 30IRE), 0Lux(IR LED on)
Video Out	CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation 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) V : 58.0°(Wide)~26.6°(Tele) 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
<b>Pan / Tilt / Rotate</b>	
Pan / Tilt / Rotate Range	None
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
<b>Operational</b>	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SDR
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, Quadrangle zones - Color : Gray, Green, Red, Blue, Black, White - 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) Auto prefer shutter control(Based on AI engine)

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Digital PTZ	Support
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	<ul style="list-style-type: none"> <li>- Analytics events based on AI engine(NPU) : Object detection (Person/Face/Vehicle(car/truck/bus/bicycle/motorcycle)/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, DC 12V output(Max. 50mA)
Alarm Triggers	Analytics, Network disconnect, Alarm input, App event, Time schedule
Alarm Events	When alarm trigger occurred <ul style="list-style-type: none"> <li>- File upload(image) : e-mail/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) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
IR Viewable Length	WiseIR 50m(164.04ft)(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
Additional	None
<b>Network</b>	
Ethernet	Metal shielded RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/High, MJPEG
Audio Compression	G.711 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz
Smart Codec	Manual(Sea area), WiseStreamII, WiseStreamIII(Based on AI engine)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast 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	TPM 2.0 (FIPS 140-2 level 2) HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Device Certificate(Hanwha Techwin Root CA, pre-installed) Secure by default certificate(TBD) Secure OS/Boot/Storage, Verify firmware forgery

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Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet open platform
<b>General</b>	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish,, Portuguese, Czech, Polish, Turkish, Dutch, Greek, Hungarian
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slot Max. 1TB (512GB * 2)
Memory	4GB RAM, 512MB Flash
<b>Environmental &amp; Electrical</b>	
Operating Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) NEMA TS-2 : 74°C * Start up should be done at above -30°C less than 95%RH(non-condensing) 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+(IEEE802.3at, Class4), 12VDC
Power Consumption	TBD Power redundancy failover
<b>Mechanical</b>	
Color / Material	White / Aluminum Hard-coated window
RAL Code	RAL7022
Product Dimensions / Weight	Ø91x368.6mm(Ø3.85"x14.51"), 2.2kg(4.85 lb) (TBD)
Compatible Conduit hole / Gangbox	3/4" (M25) single, double, 4" octagon, 4" square
Hanging Mount (Dome)	None
Skin Cover (Dome)	None
Weather Cap (Dome)	None
Power Module	None
Backbox	None
<b>DORI (EN62676-4 standard)</b>	
Detect (25PPM/ 8PPF)	Wide: 44.8m(147.02ft) / Tele: 151.3m(496.29ft)
Observe (63PPM/ 19PPF)	Wide: 17.9m(58.81ft) / Tele: 60.5m(198.52ft)
Recognize (125PPM/ 38PPF)	Wide: 9.0m(29.4ft) / Tele: 30.3m(99.26ft)
Identify (250PPM/ 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 240 V, 50 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	XNO-8083R	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adaptor	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adaptor	PSE156G 4-Pair,Hi- Power	-	-	-
Notebook	P95G001	8KM8HT2	DELL	-
Notebook Adaptor	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Alarm1	-	-	-	-
Alarm2	-	-	-	-
Smartphone	LG-SU760	108KPQJ0186212	LG	-
Headset	K550	-	Britz®	-
Micro SD Card1	-	-	Sandisk	8 GB
Micro SD Card2	-	-	Sandisk	8 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 (LAN)	Notebook	RJ-45 (LAN)	3.0	S
	Slot	Micro SD Card1	Slot	-	-
	Slot	Micro SD Card2	Slot	-	-
	3 Pin	Alarm1	3 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm			1.7	U
	2 Pin	Adaptor	2 Pin	1.6	U
Notebook	3.5 mm	Smartphone	3.5 mm	0.8	U
	JACK	Notebook Adaptor	JACK	1.7	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 Adaptor	RJ-45 (PoE)	3.0	S
	Slot	Micro SD Card1	Slot	-	-
	Slot	Micro SD Card2	Slot	-	-
	3 Pin	Alarm1	3 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm			1.7	U
Notebook	RJ-45 (LAN)	PoE Adaptor	RJ-45 (LAN)	3.5	S
	3.5 mm	Smartphone	3.5 mm	0.8	U
	JACK	Notebook Adaptor	JACK	1.7	U

\* Unshielded=U, Shielded=S



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## 1.7 EUT Operating Mode(s)

Test Mode	operating
DC Mode	EUT Monitoring, Ping Test
PoE Mode	

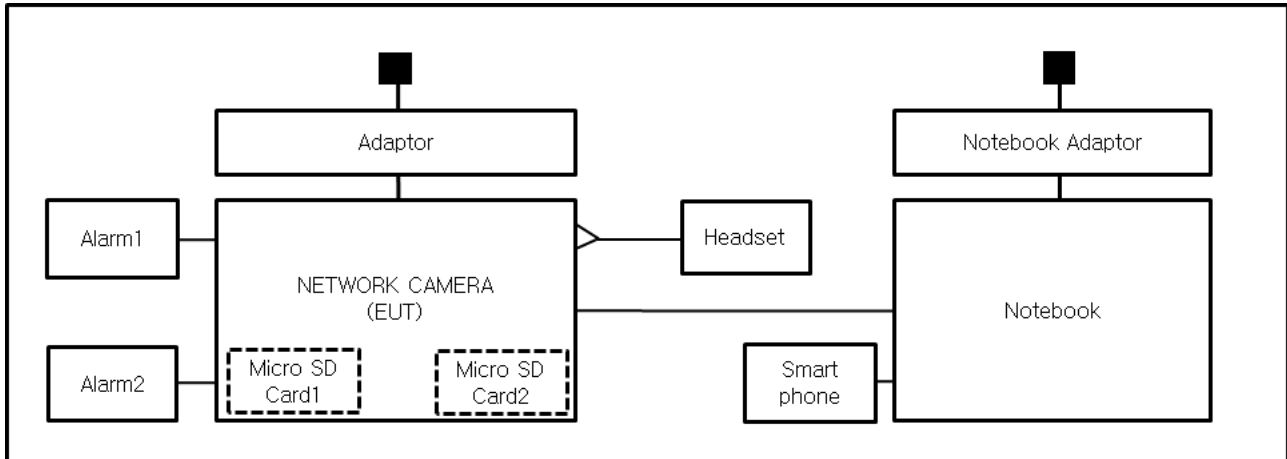
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Techwin Co., Ltd.

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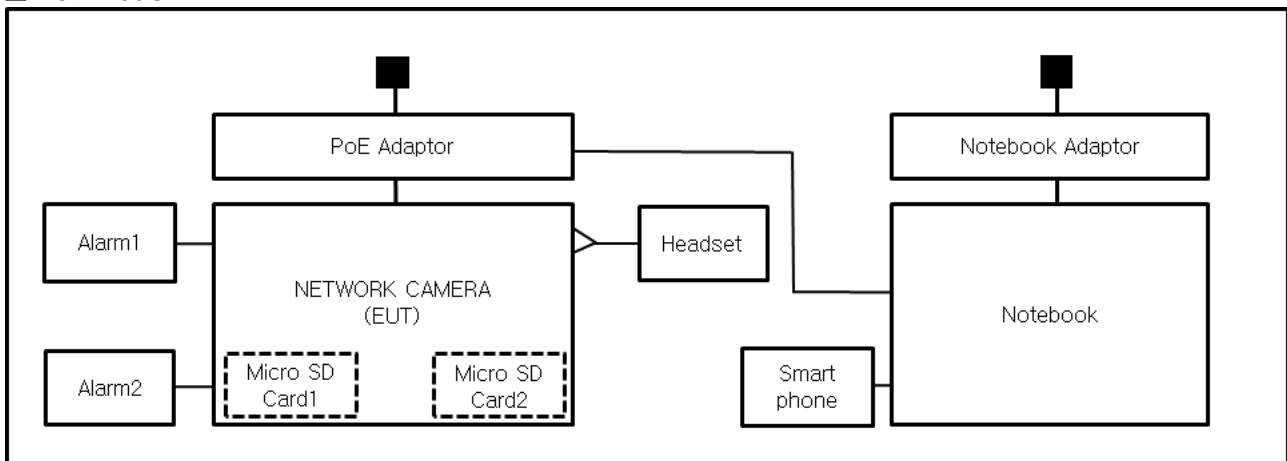
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

- USB ports, VIDEO ports are not used and have not been tested.







## 1.10 Calibration Details of Equipment Used for Measurement

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

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2019

## 1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	<b>RRA</b>	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	<b>KOLAS</b>	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	<b>FCC</b>	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	<b>ISED</b>	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	<b>VCCI</b>	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	<b>TÜV SÜD</b>	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

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- |   |   |                                  |
|---|---|----------------------------------|
| <input type="checkbox"/> <b>VCCI-CISPR 32:2016</b>                | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> <b>AS/NZS CISPR32:2015</b>    | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <br><input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>     |   |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010                   | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2009                          |   |                                  |
| <br><input type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b> |   |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                      | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                          |   |                                  |
| <br><input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>      |   |                                  |
| <br><input type="checkbox"/> EN 301 489-1 V1.9.2                  |   |                                  |
| <input type="checkbox"/> Equipment for fixed use                  |   |                                  |
| <input type="checkbox"/> Equipment for vehicular use              |   |                                  |
| <input type="checkbox"/> Equipment for portable use               |   |                                  |
| <br><input type="checkbox"/> EN 301 489-3 V1.6.1                  |   |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1                     |   |                                  |
| <input type="checkbox"/> EN 60945:2002                            |   |                                  |

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## 2.1 Conducted Emissions at Mains Power Ports

**Test Date**

Jul. 01, 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: (24,6 ± 0,1) °C

Relative Humidity: (46,7 ± 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.

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## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Jul. 01, 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 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 checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	12, 29, 2021

### Test Conditions

Temperature: (24,6 ± 0,1) °C  
Relative Humidity: (46,7 ± 0,3) % 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.

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Report No.:

KES-EM-21T0587

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

**Test Date**

Jul. 01, 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: (24,4 ± 0,2) °C

Relative Humidity: (46,5 ± 0,3) % 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.

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

### Test Date

Jul. 04, 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	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: (24,9 ± 0,3) °C

Relative Humidity: (47,1 ± 0,5) % R.H.

### Frequency Range of Measurement

1 GHz to 6 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

## APPENDIX A – TEST DATA

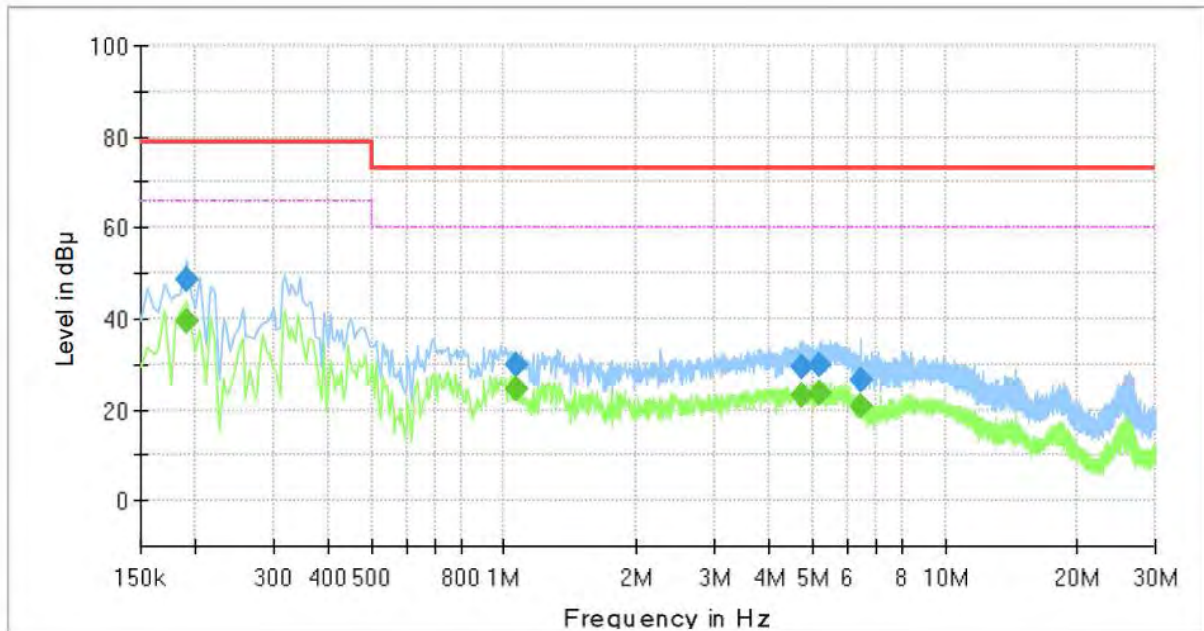
### Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

#### Common Information

Test Description:	Conducted Emission
Model No.:	XNO-8083R
Phase:	L1
Mode:	DC
Operator Name:	KES



### Final Result

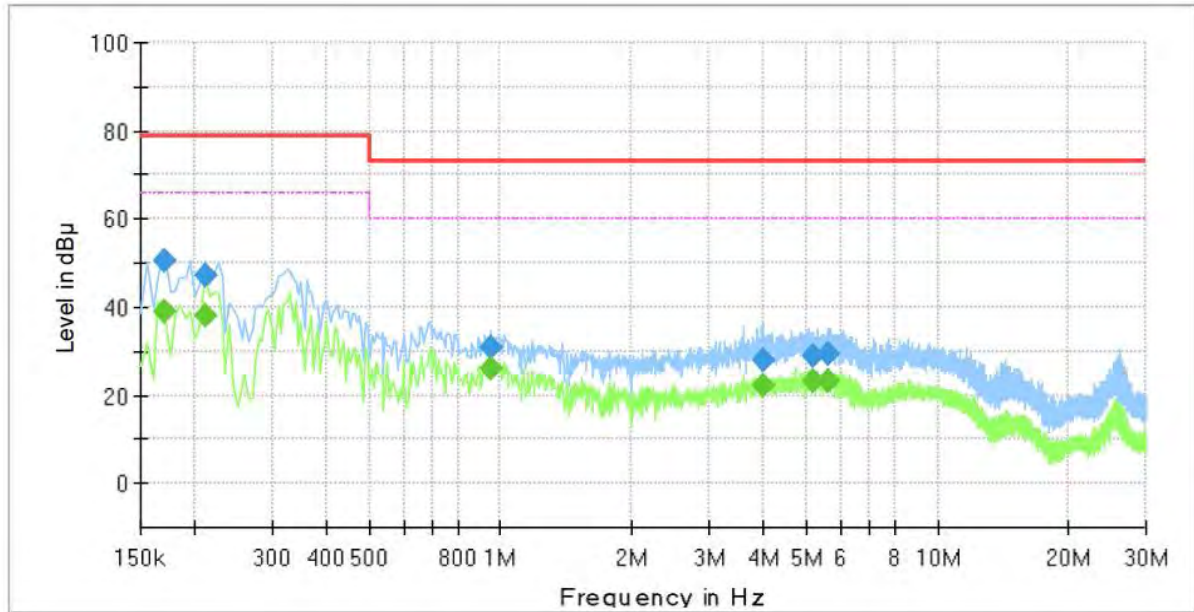
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	---	39.24	66.00	26.76	1000.0	9.000	L1	19.4
0.190000	48.64	---	79.00	30.36	1000.0	9.000	L1	19.4
1.070000	---	24.75	60.00	35.25	1000.0	9.000	L1	20.1
1.070000	29.75	---	73.00	43.25	1000.0	9.000	L1	20.1
4.730000	---	23.32	60.00	36.68	1000.0	9.000	L1	19.7
4.730000	29.16	---	73.00	43.84	1000.0	9.000	L1	19.7
5.170000	---	23.74	60.00	36.26	1000.0	9.000	L1	19.6
5.170000	29.92	---	73.00	43.08	1000.0	9.000	L1	19.6
6.425000	---	20.59	60.00	39.41	1000.0	9.000	L1	19.5
6.425000	26.70	---	73.00	46.30	1000.0	9.000	L1	19.5

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## NEUTRAL LINE

### Common Information

Test Description:	Conducted Emission
Model No.:	XNO-8083R
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)
0.170000	---	38.85	66.00	27.15	1000.0	9.000	N	19.4
0.170000	50.41	---	79.00	28.59	1000.0	9.000	N	19.4
0.210000	---	38.15	66.00	27.85	1000.0	9.000	N	19.4
0.210000	47.22	---	79.00	31.78	1000.0	9.000	N	19.4
0.950000	---	26.09	60.00	33.91	1000.0	9.000	N	20.0
0.950000	30.92	---	73.00	42.08	1000.0	9.000	N	20.0
4.010000	---	22.15	60.00	37.85	1000.0	9.000	N	19.9
4.010000	27.96	---	73.00	45.04	1000.0	9.000	N	19.9
5.160000	---	23.09	60.00	36.91	1000.0	9.000	N	19.6
5.160000	29.12	---	73.00	43.88	1000.0	9.000	N	19.6
5.590000	---	23.05	60.00	36.95	1000.0	9.000	N	19.6
5.590000	29.40	---	73.00	43.60	1000.0	9.000	N	19.6

#### ◆ 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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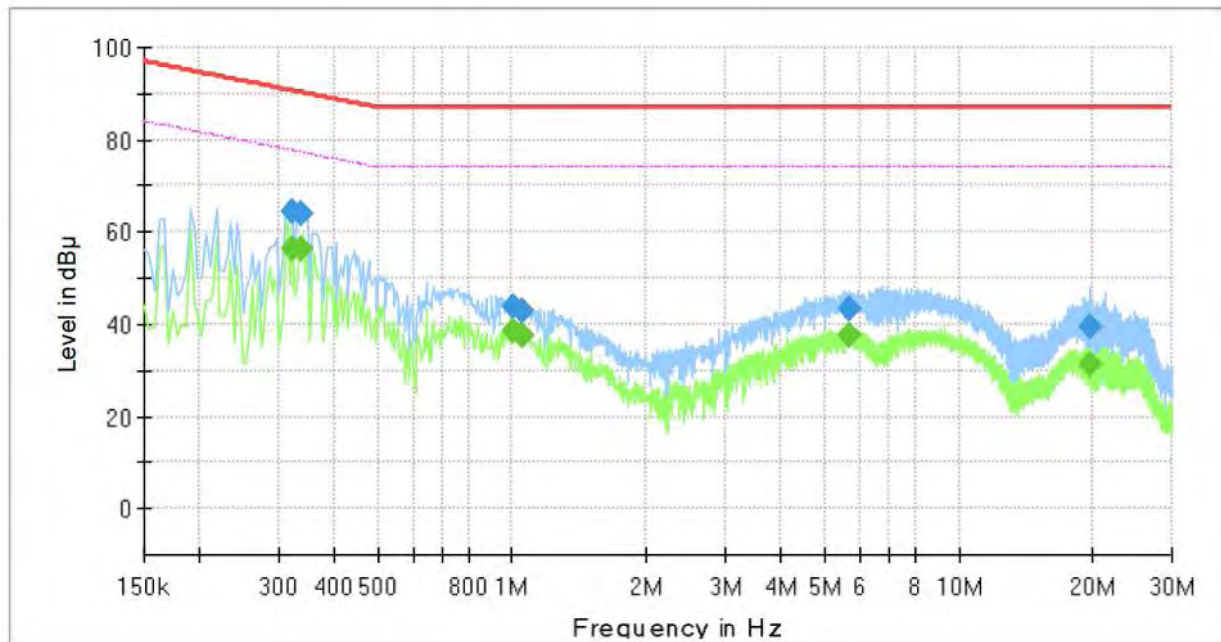
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	XNO-8083R
Mode :	DC
Speed :	1 000 Mbps
Operator Name:	KES



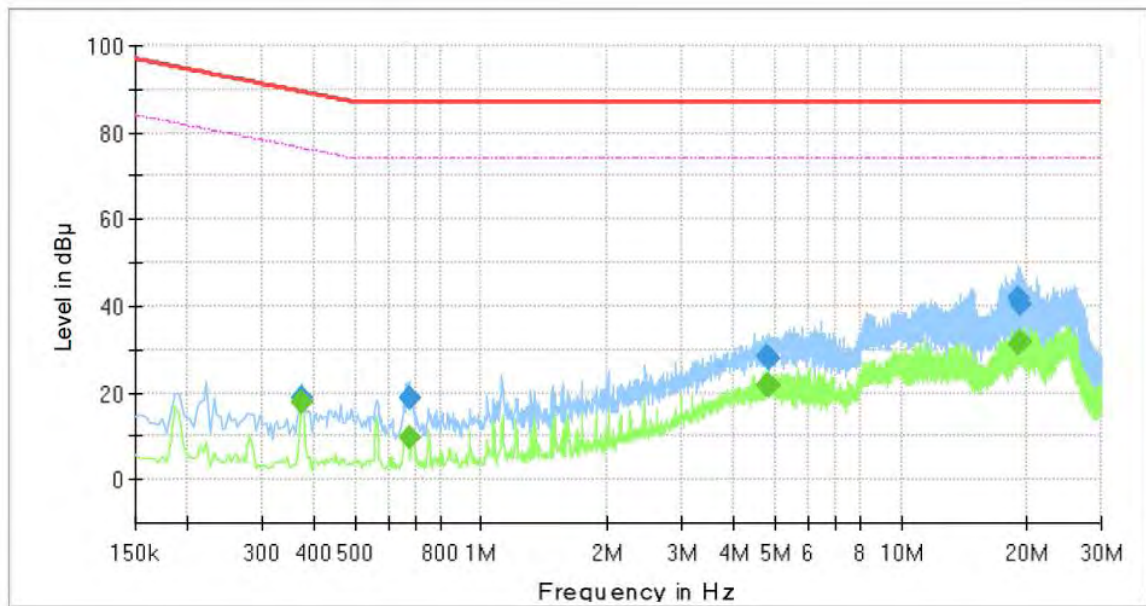
### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.322000	---	56.07	77.66	21.59	1000.0	9.000	Single Line	19.5
0.322000	64.47	---	90.66	26.19	1000.0	9.000	Single Line	19.5
0.338000	---	56.26	77.25	20.99	1000.0	9.000	Single Line	19.5
0.338000	63.92	---	90.25	26.33	1000.0	9.000	Single Line	19.5
1.010000	---	38.49	74.00	35.51	1000.0	9.000	Single Line	19.9
1.010000	43.58	---	87.00	43.42	1000.0	9.000	Single Line	19.9
1.054000	---	37.63	74.00	36.37	1000.0	9.000	Single Line	19.9
1.054000	42.60	---	87.00	44.40	1000.0	9.000	Single Line	19.9
5.662000	---	37.32	74.00	36.68	1000.0	9.000	Single Line	19.4
5.662000	43.22	---	87.00	43.78	1000.0	9.000	Single Line	19.4
19.746000	---	31.39	74.00	42.61	1000.0	9.000	Single Line	20.1
19.746000	39.58	---	87.00	47.42	1000.0	9.000	Single Line	20.1

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**PoE Mode**
**[1 000 Mbps]**
**Common Information**

Test Description:	Telecommunication Emission
Model No.:	XNO-8083R
Mode :	PoE
Speed :	1 000 Mbps
Operator Name:	KES


**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.374000	---	17.99	76.41	58.42	1000.0	9.000	Single Line	19.5
0.374000	19.01	---	89.41	70.40	1000.0	9.000	Single Line	19.5
0.674000	---	9.85	74.00	64.15	1000.0	9.000	Single Line	19.8
0.674000	18.67	---	87.00	68.33	1000.0	9.000	Single Line	19.8
4.818000	---	21.58	74.00	52.42	1000.0	9.000	Single Line	19.5
4.818000	28.20	---	87.00	58.80	1000.0	9.000	Single Line	19.5
4.838000	---	21.58	74.00	52.42	1000.0	9.000	Single Line	19.5
4.838000	27.74	---	87.00	59.26	1000.0	9.000	Single Line	19.5
18.938000	---	31.54	74.00	42.46	1000.0	9.000	Single Line	20.1
18.938000	42.01	---	87.00	44.99	1000.0	9.000	Single Line	20.1
19.146000	---	31.79	74.00	42.21	1000.0	9.000	Single Line	20.1
19.146000	40.46	---	87.00	46.54	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))





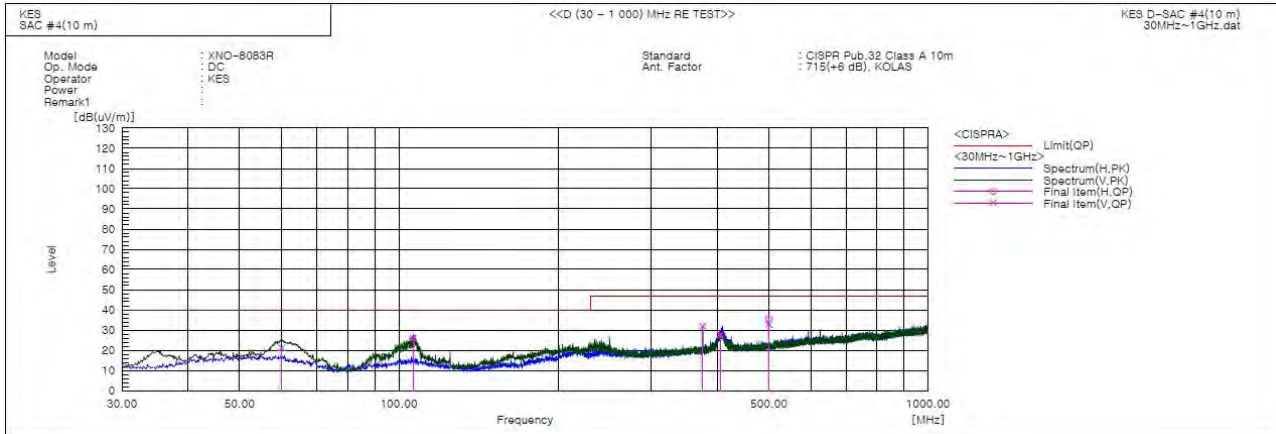
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### Radiated Electric Field Emissions(Below 1 GHz)

#### ■ 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	60.070	V	43.3	-22.0	21.3	40.0	18.7	100.0	256.0	
2	106.388	V	48.4	-22.4	26.0	40.0	14.0	356.0	348.0	
3	374.956	V	46.7	-14.8	31.9	47.0	15.1	221.0	172.0	
4	404.663	V	41.9	-14.2	27.7	47.0	19.3	101.0	156.0	
5	499.965	V	44.4	-11.6	32.8	47.0	14.2	100.0	172.0	
6	499.965	H	47.4	-11.6	35.8	47.0	11.2	251.0	270.0	

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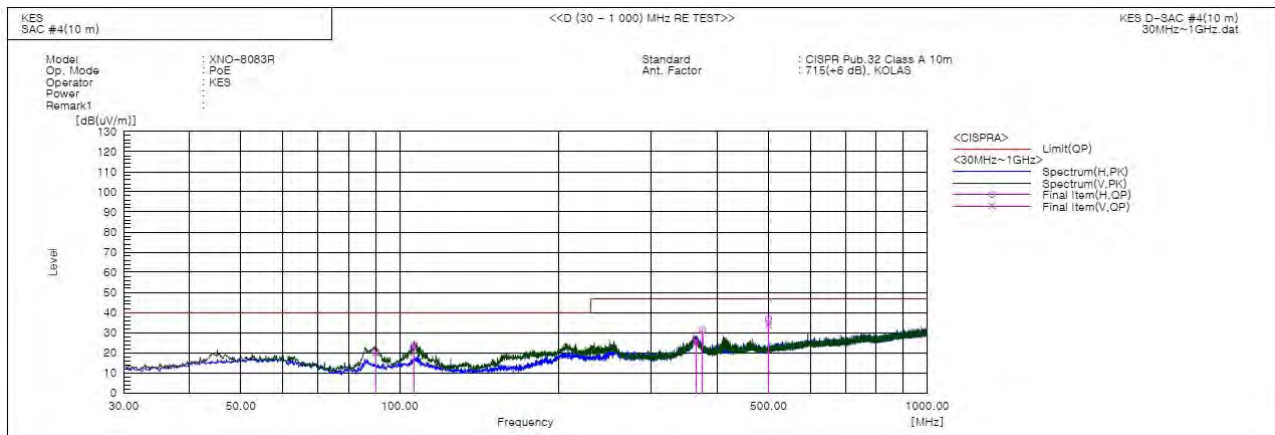


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### PoE Mode



### 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	90.261	V	44.0	-24.1	19.9	40.0	20.1	125.0	13.0	
2	106.509	V	45.7	-22.4	23.3	40.0	16.7	119.0	0.0	
3	364.286	V	40.9	-15.0	25.9	47.0	21.1	100.0	0.0	
4	374.956	H	46.0	-14.8	31.2	47.0	15.8	351.0	268.0	
5	499.965	V	45.3	-11.6	33.7	47.0	13.3	100.0	224.0	
6	499.965	H	48.4	-11.6	36.8	47.0	10.2	220.0	329.0	

### ◆ Calculation

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

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

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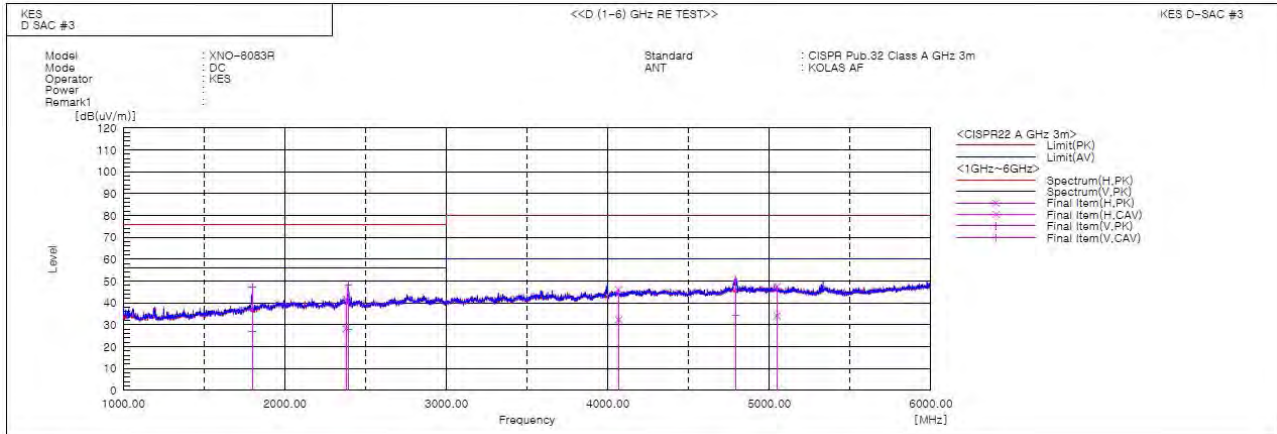
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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ 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	1798.099	V	50.0	29.7	-2.9	47.1	26.8	76.0	56.0	28.9	29.2	100.0	234.7	
2	2379.423	H	41.7	28.1	0.2	41.9	28.3	76.0	56.0	34.1	27.7	100.0	170.5	
3	2393.000	V	47.9	27.9	0.2	48.1	28.1	76.0	56.0	27.9	27.9	100.0	320.3	
4	4067.000	H	39.9	26.1	6.2	46.1	32.3	80.0	60.0	33.9	27.7	100.0	356.8	
5	4790.000	V	41.5	26.0	8.5	50.0	34.5	80.0	60.0	30.0	25.5	100.0	22.3	
6	5047.746	H	38.5	25.1	9.0	47.5	34.1	80.0	60.0	32.5	25.9	100.0	359.4	

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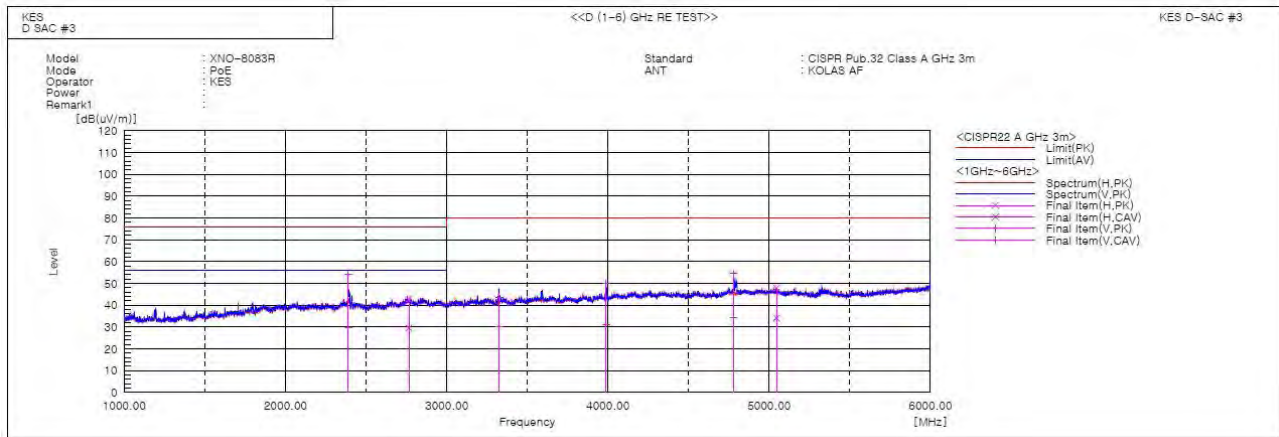


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### PoE Mode



#### 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	2390.000	V	53.8	29.5	0.2	54.0	29.7	76.0	56.0	22.0	26.3	100.0	13.2	
2	2765.642	H	40.5	27.4	2.2	42.7	29.6	76.0	56.0	33.3	26.4	100.0	304.2	
3	3323.000	V	40.7	27.4	3.0	43.7	30.4	80.0	60.0	36.3	29.6	100.0	320.6	
4	3989.520	V	44.5	25.6	5.6	50.1	31.2	80.0	60.0	29.9	28.8	100.0	168.7	
5	4780.901	V	46.3	25.9	8.4	54.7	34.3	80.0	60.0	25.3	25.7	100.0	25.4	
6	5045.007	H	38.9	25.2	9.0	47.9	34.2	80.0	60.0	32.1	25.8	100.0	332.1	

#### 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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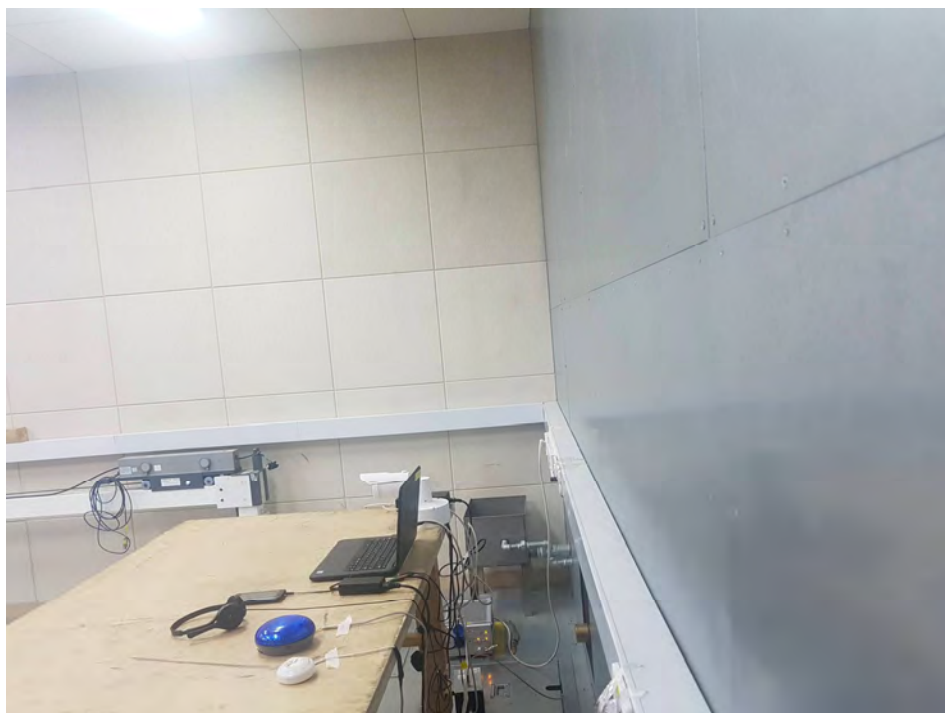
## Conducted Emissions at Telecommunication Ports

### ■ DC Mode



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■ PoE Mode

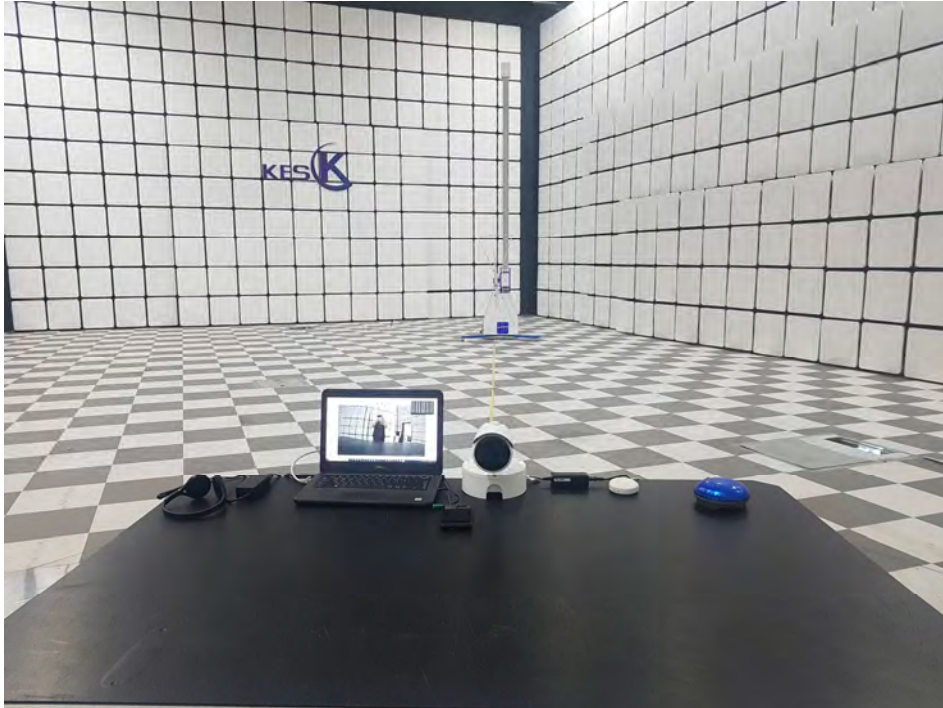


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## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



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**■ PoE Mode**

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## Radiated Electric Field Emissions(Above 1 GHz)

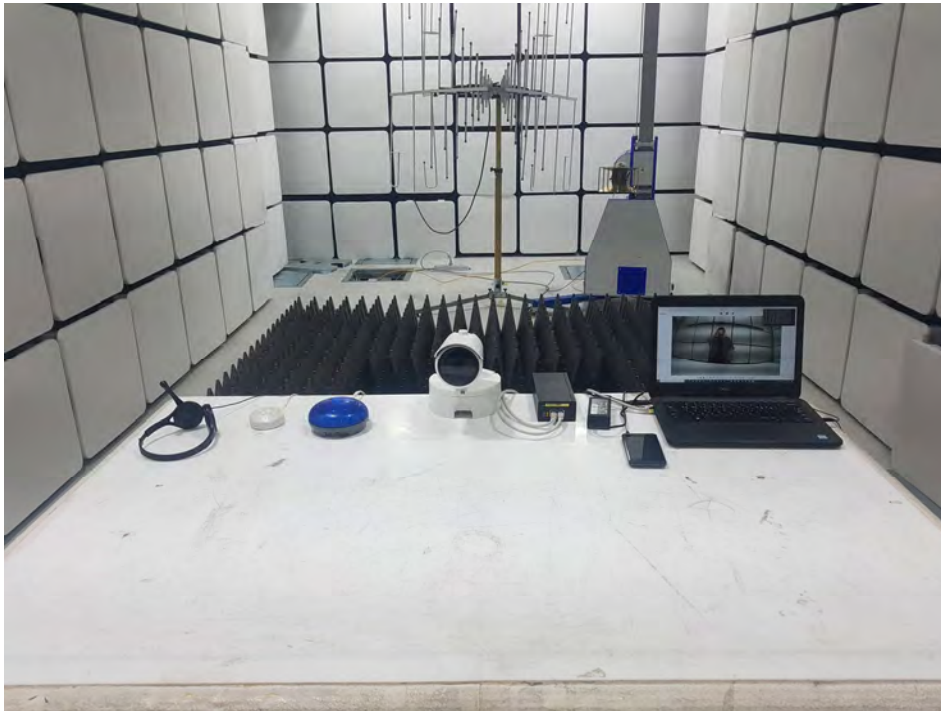
### ■ DC Mode



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■ PoE Mode

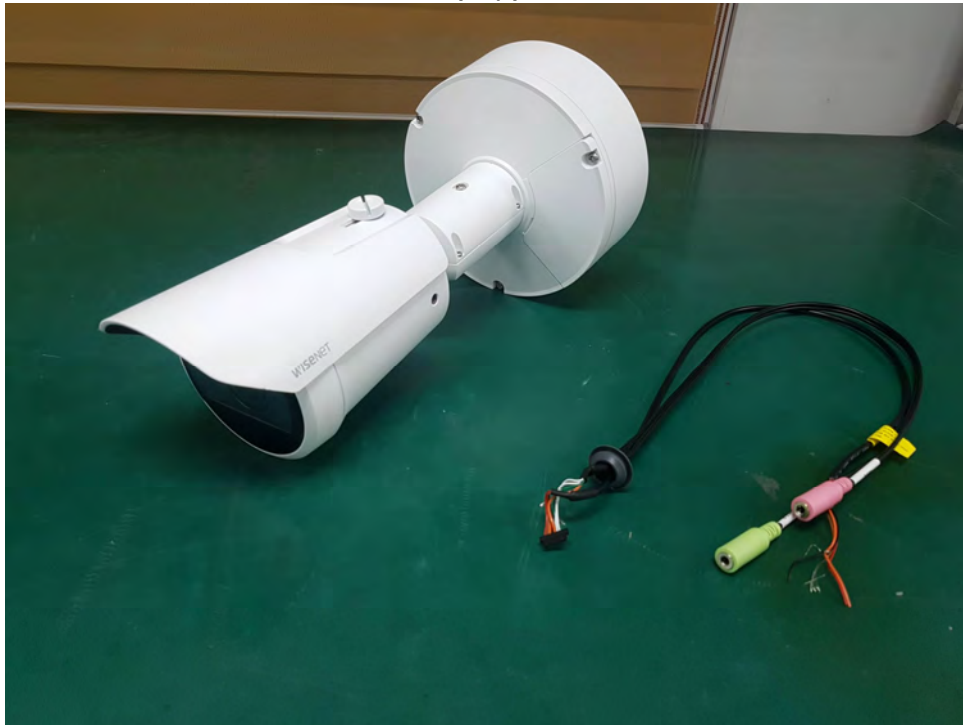


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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

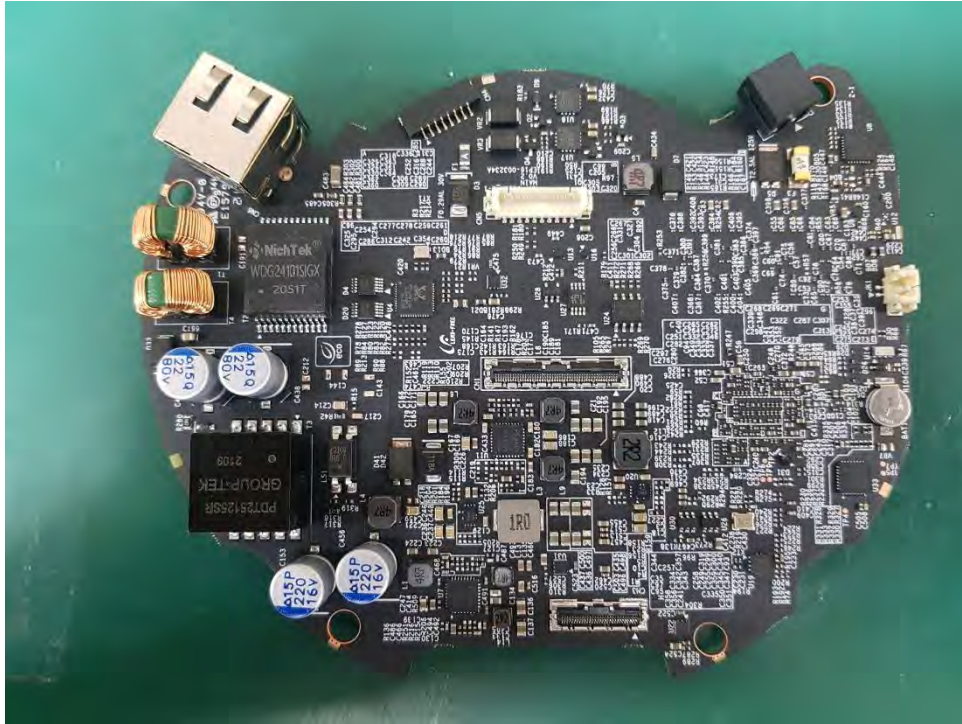
(Internal View)



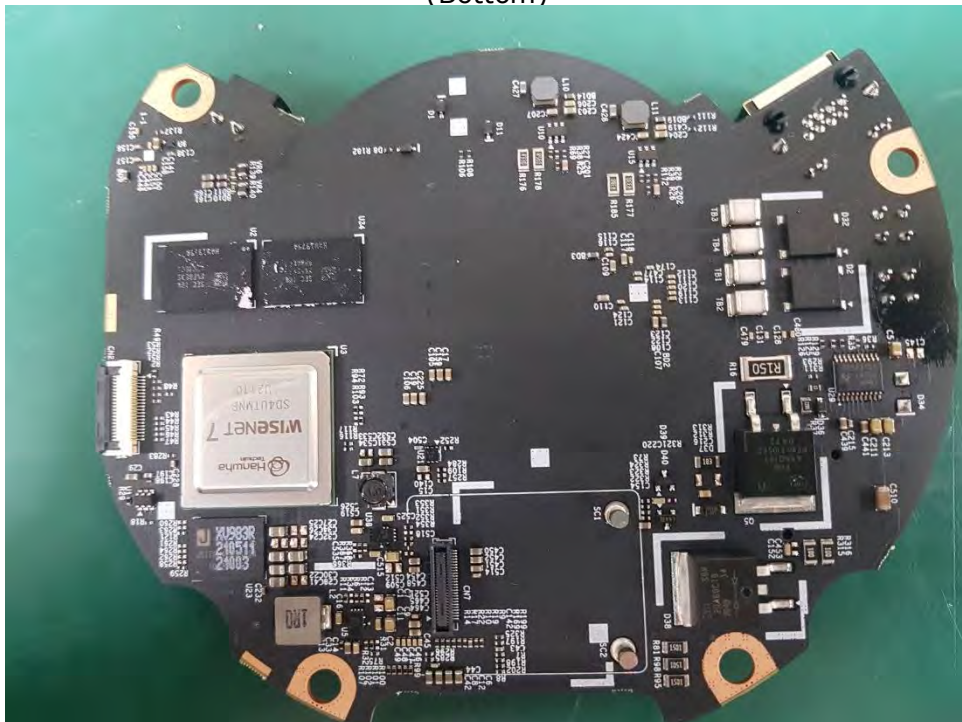
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## EUT Internal View – Board 1

(Top)



(Bottom)



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## EUT Internal View – Board 2

(Top)



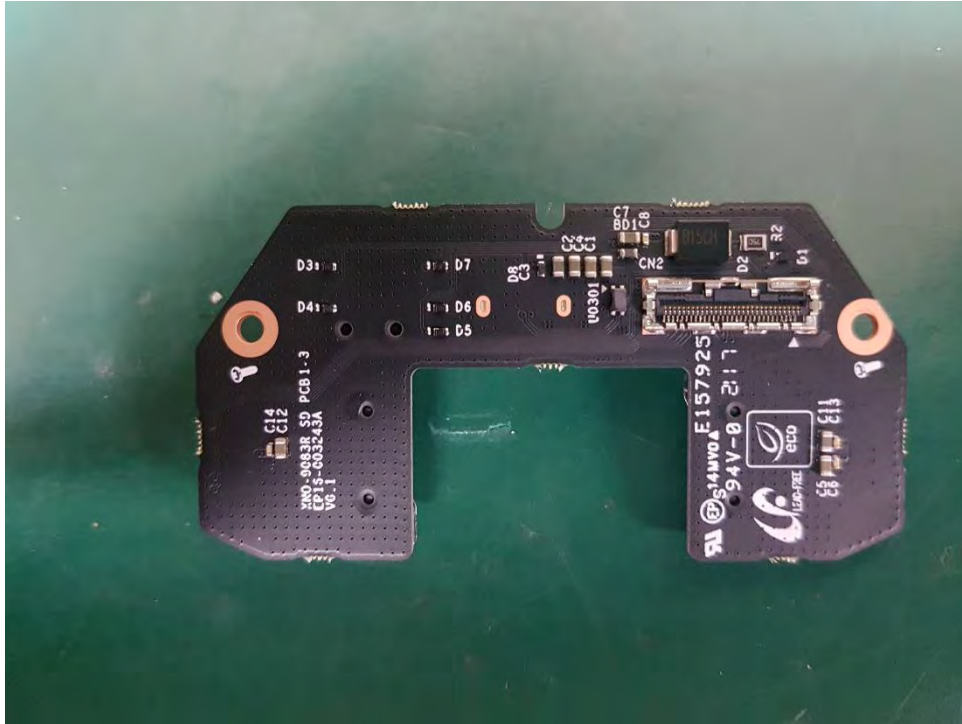
(Bottom)



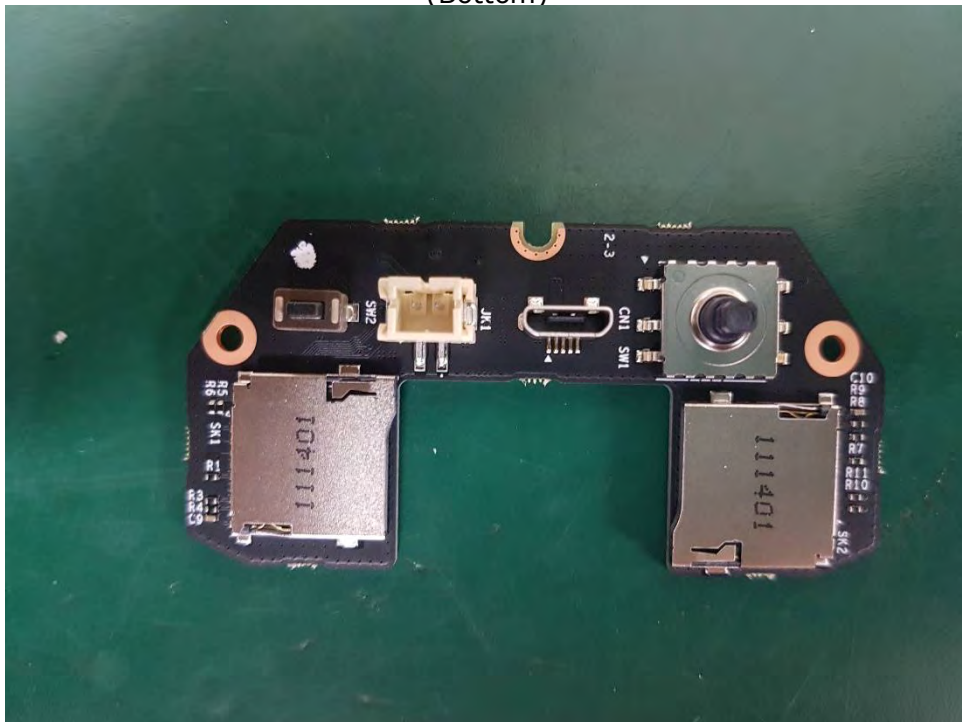
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## EUT Internal View – Board 3

(Top)



(Bottom)



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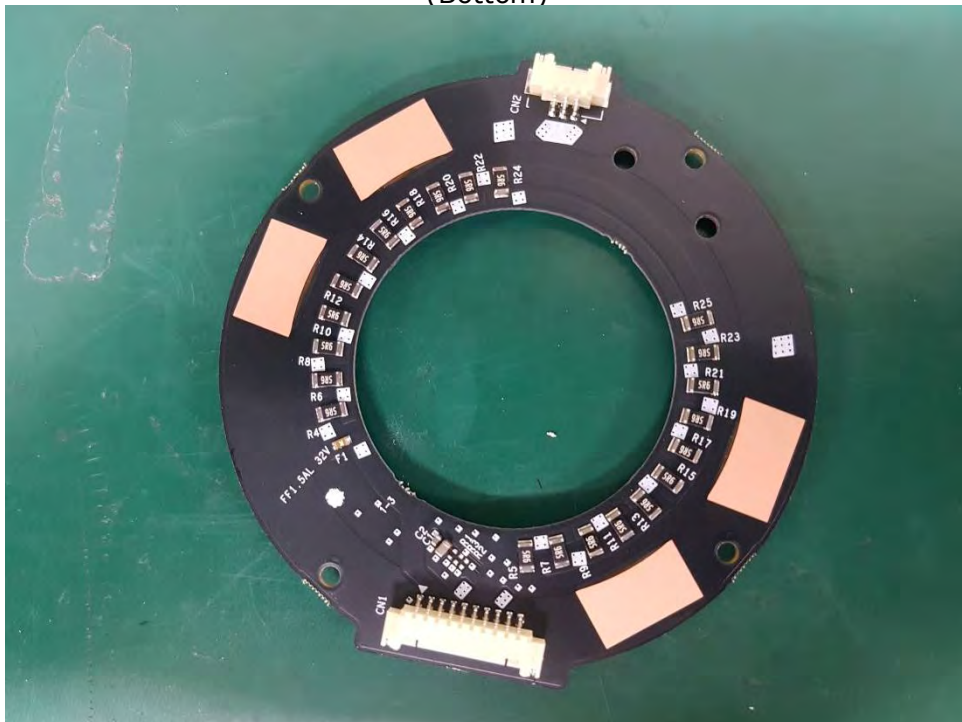


## EUT Internal View – Board 4

(Top)



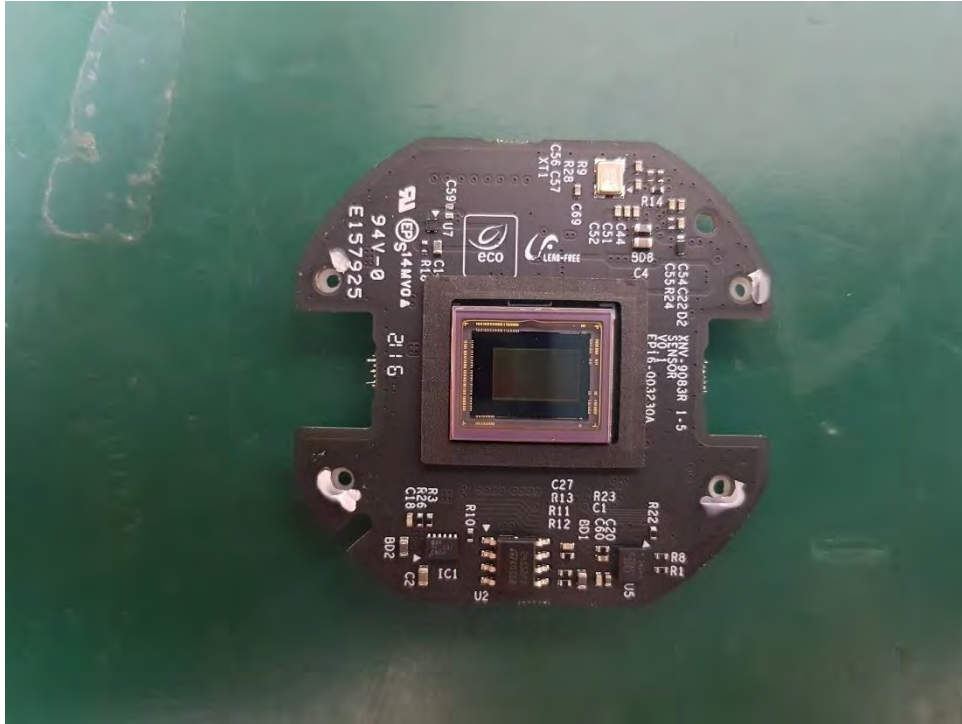
(Bottom)



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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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